



The tonal grammar of Yongning Na

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The tonal grammar of Yongning Na

WORK IN PROGRESS. Draft version 1 (Dec. 2014)

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Work on the present document started in 2012. The draft has been circulated among colleagues. It is gradually being improved. This is a highly sketchy draft. Publication in book form is likely to take place only after several more years. Issues of formatting have not yet been addressed at this stage: each chapter constitutes a separate entity with its own page numbering and list of references.

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Comments welcome.

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Chapter 1

Introduction

The motivation for writing this book is to provide an in-depth description and analysis of the tone system of Yongning Na, a Sino-Tibetan language spoken in Southwest China. Section 1 introduces the Na language, and Na society. Section 2 presents the motivation for focusing on the tone system of Na, and sets out the theoretical backdrop to the study. Section 3 presents the language consultants and the chronology of fieldwork.

1. Presentation of the Na language and Na society, and review of earlier studies

Yongning Na is a Sino-Tibetan language spoken in and around the plain of Yongning, located in Southwestern China, at the border between Yunnan and Sichuan, at a latitude of 27°50' N and a longitude of 100°41' E. The Na have been referred to by various names, as shown in Table 1; clarifications are offered in the following paragraphs.

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Table 1. The names of the Na: endonyms and exonyms.

phonetic transcription	language	romanized equivalents	Chinese equivalents	meaning
naɿɬ	Na	Na (Lid	纳 (Yang Fuquan 2006)	‘black’, presumably by reference to clothing: dyed hemp cloth
hiɿ-hiɿ#ɿ	Na	Hli-khin (Rock 1963); Hli-hing (Shih 1993)	里新 (Shih 2008:15)	‘People of the Centre’; refers specifically to the inhabitants of the plain of Yongning
lyɿ-ɕiɿ	Naxi	Lü-khi (Rock 1963)	吕西 (Guo Dalie & He Zhiwu 1994:8)	ditto
origin not established yet	Chinese	Moso (Cordier 1908; Shih 1993; Luo 2008; McKhann 1998), Mo-So, Mosuo (Knödel 1995)	摩沙, 磨些, 麽些, 摩些, 摩娑, 末些, 磨获, 莫俊, 摩梭	not established yet

1.1. Dialect classification: Yongning Na and Naxi

Yongning Na was investigated in 1979 by the linguists He Jiren 和即仁 and Jiang Zhuyi 姜竹仪, who classified it among Eastern Naxi dialects (He Jiren & Jiang Zhuyi 1985:4, 104–116). The division of Naxi into Eastern and Western dialects was initially advanced cautiously, as a working hypothesis essentially based on relatively short stays in the field in 1956 and 1957 as part of the national survey of the languages spoken within the borders of the People’s Republic of China.

From our analysis and comparison of the available linguistic and cultural materials, we propose a preliminary division between two dialects, Western and Eastern. But due to the very short amount of time [that could be devoted to this research] and the shortcomings of our experience, it is difficult to tell whether this division tallies with the actual language situation... (“我们从现有的语言和人文材料来加以分析和比较, 将纳西语初步分划为

西部和东部两个方言。不过时间短促，经验不足，这样分划不知是否符合客观现实情况……”)(和即仁 & 和志武 1988:vol. III, page 120)

The Western dialect area as proposed by He and Jiang by and large corresponds to the area ruled by the lords of Lijiang from the 14th to the 18th century. The Eastern dialect area is located to its east and north-east, across the Yangtze river, in the present-day counties of Ninglang 宁蒗, Yanyuan 盐源, Muli 木里, and Yanbian 盐边 (see map, p. xyz [adapt from: Brill 2013/2014, *Encyclopedia*]). The history of Yongning as presented by the Naxi scholars Guo Dalie 郭大烈 and He Zhiwu 和志武 can be summarized as follows. In 794 AD, the Nanzhao kingdom (南诏) conquered the Na/Naxi area, including Yongning. After the fall of Nanzhao, the kingdom of Dali (大理国, 937-1253) exercised control over Yongning, whereas the area of present-day Lijiang (丽江) was ruled by an indigenous lord allied with Dali. At the outset of the Yuan dynasty, a new feudal lord (tūsī 土司) was installed as lord of Yongning by the Mongolians when they passed through Yongning on their way to attack the kingdom of Nanzhao. During the Yuan and Ming dynasties, incessant wars took place between the feudal lords of Yongning, Lijiang and Yanyuan (盐源). In 1545, Yongning united with the neighbouring areas of the five 所 suǒ (Zuosuo 左所, Yousuo 右所, Qiansuo 前所, Housuo 后所, and Zhongsuo 中所). The Yangtze river constituted the border between the territories of Yongning and Lijiang (Guo Dalie and He Zhiwu 1994 [2nd ed. 1999]).

Part of the relevant Chinese historical sources on Na/Naxi history are summarized by Chavannes 1912 (reprinted in Bacot 1913). An outline of the history of the area is presented by Gros (1996).

Within the Eastern dialect area, three sub-dialects were distinguished by He and Jiang: Yongning 永宁, Guabie 瓜别 and Beiquba 北茭坝. This classification came to be used as the standard in Chinese scholarship. It is also taken up in the inventory of languages maintained by the Summer Institute of Linguistics: *Ethnologue: Languages of the World*. Naxi used to appear in *Ethnologue* under the language code NBF, which covered all the dialects, i.e. granting the name “Naxi” the same extension as in Chinese scholarship. As from 2010, “Eastern” dialects of Naxi were granted an entry of their own in this inventory, under the romanized name “Narua” (code: NRU). The former language code NBF is now split into (i) Naxi proper (new code: NXQ), corresponding to “Western Naxi” in Chinese terminology; and (ii) “Narua” (code: NRU), corresponding to “Eastern Naxi” in Chinese terminology. In detail, however, the division into dialects proposed for “Narua” is identical with that proposed by He and Jiang for “Eastern Naxi”,

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distinguishing three varieties: Yongning 永宁, Guabie 瓜别 and Beiquba 北葵坝. The total number of speakers was estimated at about 40,000 on the basis of early surveys (He and Jiang 1985, 107); the same figure is taken up by Yang Zhenhong (2009). The Ethnologue entry mentions a figure of 47,000 as of 2012.

No large-scale dialectal comparison was conducted in the half-century that followed the first dialect survey. The list of “subfamilies” (支系) of the “Naxi nationality” (纳西族) provided by Guo Dalie and He Zhiwu (1994, 5–9) can serve as a useful reference for such a survey, keeping in mind that this list was essentially based on anthropological criteria, rather than on linguistic data. Reliable descriptions of the language varieties grouped under the label “Naxi” are required for fine-grained dialectological and comparative research. The present volume aims to contribute to this long-term endeavour by offering an in-depth synchronic description of one specific language variety.

1.2. The position of Na and Naxi within Sino-Tibetan

The position of Naxi and Na within Sino-Tibetan is a topical issue in Sino-Tibetan historical linguistics. Naxi was classified as a member of the Yi/Lolo group by Shafer (1955); however, Bradley (1975) showed that it does not share the innovations that characterize this group, and concluded that Naxi is “certainly not a Loloish language, and probably not a Burmish language either” (p. 6). Some scholars (especially in mainland China) nonetheless maintain the classification of Naxi as a member of the Yi/Lolo group; Gai Xingzhi and Jiang Zhuyi (1990) base this renewed claim on the high percentage of phonetically similar words between Naxi and Yi/Lolo, though without verifying the regularity of sound correspondences.

It is becoming increasingly clear that Naxi and Na have points of resemblance with neighbouring languages currently classified as Qiangic, such as Shixing (about which see Chirkova 2009 and references therein) and Namuyi (Lama Ziwo 1994; see also Sun Hongkai 2001; and Yang Fuquan 2006). Observations of similarities with Qiangic have led Sun Hongkai to propose that Naxi (understood as encompassing Naxi, Yongning Na, and other closely related varieties) is an “intermediate language” (“*línjiè yǔyán* 临界语言 ”) between Loloish and Qiangic (孙宏开 1984). This compromise view acknowledges typological similarities without contradicting headlong the earlier classification of Naxi within Yi

(Loloish) languages.¹ This amounts to projecting the presence of Yi-like and Qiangic-like typological features into the indefinite past. By a similar reasoning, the presence of words of Chinese, Tai-Kadai and Mon-Khmer origin in Vietnamese could lead to its classification as an “intermediate language”, straddling, as it were, the divide between these three language families. Historical linguists, however, tend to favour an approach in which borrowings and other changes in the language are gradually identified, one layer after another, eventually resulting in a detailed account of the language’s evolution that includes the influences to which the language was subjected through the ages. It was already clear to Maspero, in his study on Vietnamese, that one of the three lexical components in the language must reflect the phylogenetic affiliation of the language, and the other two must be due to later contacts:

“Pre-Annamite was born out of the fusion of a Mon-Khmer dialect with a Tai dialect; the fusion may even have involved a third language, which remains unidentified. At a later period, the Annamite language borrowed a huge number of Chinese words. But the language whose influence dominated and gave Annamite its modern form was definitely a Tai language, in my opinion; I think the Annamite language must be related to the Tai family.” (Maspero 1912:117)

Maspero’s identification of Tai-Kadai as the basic stock turned out to be erroneous. A more precise set of concepts was later used by Haudricourt: in his demonstration of the Austroasiatic (Mon-Khmer) affiliation of Vietnamese, he emphasized that vague notions such as “language fusion” are misleading.

“If we admit that there is no such thing as “fusion” between languages, and that genealogical relatedness must be assessed on the basis of core vocabulary and grammatical structure, we are led to consider that the modern form of a language is not determined by its genealogical origin, but by the influences to which it is subjected in the course of its history. For a thousand

¹ The original statement is the following: “纳西语经常被认为是彝语支的语言，大家知道，纳西语在彝语支中是不太合套的一种语言 [David Bradley, Proto-Loloish, 1978: 14]，纳西语动词的互动范畴和羌语支完全一致。此外纳西语方言中还有一些语音、词汇和语法现象，与羌语支语言相一致。纳西语示羌语支和彝语支之间的“临界”语言。即在语言谱系分类上兼有两种语言集团的不同的特征。也就是说，纳西语同时兼有彝语支和羌语支所特有的某些特征，而动词互动范畴，则是纳西语兼有羌语支的一种重要的语法特征。”(孙宏开 1984:14)

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years, from one or two centuries before the common era until the 10th century, the Tai and Vietnamese peoples have lived under Chinese domination; to me, this is a sufficient explanation for the converging evolution of the Tai and Vietnamese languages.” (Haudricourt 1953; my translation)

Returning to Yongning Na, the traditional method of comparative-historical phonology appears as the best guide to clarify the issue of the language’s phylogenetic affiliation. A preliminary comparative study based on Yongning Na, Lijiang Naxi, and Laze – a variety spoken in Muli County – concludes that these three varieties are unmistakably related (Jacques & Michaud 2011; further arguments are provided in Michaud 2011). A working hypothesis is proposed, whereby these languages join into a Naish lower-level subgroup, itself joining with Shixing and Namuyi into a Naic subgroup. At a third level, Naic joins with Ersuish (also called Ersuic: Yu 2012) and Qiangic, to form a Na-Qiangic node. Na-Qiangic further joins with Lolo-Burmese, to form a Burmo-Qiangic higher-level grouping, provisionally placed on a par with Bodic, Sinitic, and other primary branches. This is shown in Figure xyz below.

Figure xyz. A tentative family tree showing the position of Yongning Na within a Burmo-Qiangic branch of Sino-Tibetan.

(insert Figure xyz_FamilyTree here)

1.3. Anthropological research about the Na/Mosuo

Yongning is famous among anthropologists for its particular family structure: traditionally, brothers and sisters lived all their lives in their mother’s house, together with their relatives on the mother’s side: cousins, aunts and uncles, and grandmother and her brothers and sisters. The present review does not attempt extensive coverage of the considerable anthropological, ethno-historical and sociological literature about the Na; its aim is to convey a sense of the development of the field, and of the diversity of approaches and viewpoints.

1.3.1. Reports of surveys conducted in the 1960s

The literature on Na society and family structure includes in-depth research reports in Chinese, based on surveys conducted in the 1960s (国家民委民族社会历史调查云南省编辑组 1986). In the early 1980s, several re-

searchers involved in the survey published books based on these materials, before the publication of the original reports (詹承绪 et al. 1980; 严汝娴 & 宋兆麟 1984). These researchers adhered to an evolutionary perspective, which led them to the conclusion that Na society was a “living fossil”, a remnant of a matriarcal model that existed prior to patriarchy, constituting decisive proof of the reality of Lewis Henry Morgan’s theory (1877), as embraced by Marx: that family structure evolved from the consanguine family via the matrilineal clan to the patrilineal nuclear family.

This view of Na society, still taken up today in the touristic promotion of the Na area, created no small amount of resentment on the part of the Na (see Shih 2010:132). The fact that all the data were eventually published (and reprinted in 2009), including the real names of the people who entrusted to the visiting ethnologists detailed information on their private lives, also comes as a shock in view of present-day ethical standards for the respect of human subjects. On a positive note, the three volumes of the initial report (close to one thousand pages in total) constitute to this day the most detailed description of Na family structure. The results of the survey are organized by village, and bring out subtle differences between villages and between individual households.

1.3.2. Cai Hua 1997: “A society without fathers or husbands”

The first book to present a study of Na family structure to a non-Chinese-reading audience was Cai Hua’s *Une société sans père ni mari: les Na de Chine / A society without fathers or husbands: the Na of China* (Cai Hua 1997). Cai Hua is careful to distance himself from his former colleagues such as Yan Ruxian, denouncing the evolutionary bias in their writings. But Cai’s book has its own bias: “in setting out to make certain points, Cai picks his un-referred cases rather selectively and ignores the cases which do not fit his argument” (Wellens 2003). The book is somewhat selective in its presentation of the data, in order to bring out forcefully the uniqueness of this society, represented as “the ‘other’ of the Han Chinese: a society free of the constrictions of Confucian morality” (ibid.). Rather than “a society without fathers or husbands”, Yongning Na society might be better described as a society where there is no change in an individual’s affiliation to a household during his/her lifetime. He Xueguang (p.c.) describes this as 不娶不嫁 (*bù qǔ bù jià*), i.e. men do not *take* a wife into their family, and women do not *leave* their family to join their partner’s.

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1.3.3. Shih Chuan-Kang (1993, 2010) and Weng Naiqun (1993)

Two important Ph.D. dissertations about the Na were completed in 1993: those of Shih Chuan-Kang and Weng Naiqun (followed in 1995 by Emily Chao's, which has a stronger focus on the Naxi). A Chinese translation of Shih's dissertation was published in 2008 (施传刚 2008), and an enlarged English edition, with additional fieldwork results, in 2010 (Shih 2010). These studies provide an in-depth analysis of Na society, on the basis of new fieldwork data.

On a critical note, Shih's conclusions on linguistic issues are somewhat hasty, as when accepting the folk etymology of the place name 'Yongning', /iɪdiɪ/, as 'the peaceful land' (2010, 23): phonetic correspondences with Naxi support the analysis of this name as 'the central land, the heartland' (Naxi: /lyɪdy/; /ly-/ means 'centre' in Naxi, as does /iɪ-/ in Na). One may likewise entertain reasonable doubt about the author's interpretation of the exonym 'Mosuo' and its variants found in Chinese chronicles. He believes that its origin is the same as that of English 'kangaroo', from an aboriginal word which Captain Cook assumed to refer to the animal when in actually meant 'I don't understand'. Shih Chuan-Kang relates 'Mosuo' to /məɪ-suɪ/ '[I] don't know' (2010, 25-26). But etymological research on terms of such antiquity should be based on reconstructed forms, not on a comparison of present-day Mandarin with present-day Na. The earliest Chinese term, 摩沙, goes back to the Jin dynasty (265-420 AD); reconstructions of Old Chinese suggest that its realization may have been close to /*ma sræ/ (Baxter 2000). This does not match up well with the current reconstructions for the Proto-Naish stage: 'to know' is reconstructed as *si (Jacques & Michaud 2011).

To the linguist, these slight shortcomings in linguistic aspects of an anthropologist's publications serve as a word to the wise: great care must be exercised to avoid oversimplifications in areas other than one's own. In the same way as a lack of precision in linguistic analyses on the part of anthropologists casts the shadow of a doubt on their conclusions, linguists run a risk of taking a simplistic view of social phenomena, and paying insufficient attention to the social nature of language. The most reliable and precise sources of information should be sought to understand the societies whose languages we study.

On historical topics, a potential bias in Shih's study is due to the author's relentless insistence that the Naxi and Na are distinct peoples. He proposes a distinct ancestry for the two groups, tracing the one back to the barbarians referred to as 'Maoniu zhong' 牦牛种 in Han-dynasty Chinese

chronicles, and the other to the ‘Ranmang 冉駹’ of Chinese chronicles. Identifications between present-day ethnic minorities and names given to “barbarian” tribes in early Chinese writings are the subject of intense debate in China. These identifications are highly speculative, however. Shih’s statement that “patrilineal descent has been the norm for thousand of years” among the Naxi’s forebears is not altogether convincing. One may have an impression that the author, who shows great sympathy for Na society throughout his study (the 2010 edition is entitled *Quest for Harmony*), is influenced by his consultants’ viewpoint that they are clearly distinct from the Naxi, and projects this difference into the indefinite past.

1.3.4. Studies of historical divergence between the Naxi and Na: Jackson 1979, Mathieu 2003

An unfortunate consequence of Shih Chuan-Kang’s entrenched belief in the great historical depth of the Na-vs.-Naxi divide is that it leads him to reject outright the studies of other researchers who hypothesize that the Na and Naxi share a common ancestry and put forward a historical synopsis of their gradual divergence. An extreme version of this hypothesis is explored by Jackson (1979:33–46), who points out “strong resemblances with regard to their kinship patterns in particular”, and suggests that the main differences between Naxi and Na society only have a time depth of about three centuries: they would mostly originate in the in-depth sinicization of Naxi culture since the 18th century. Shih vigorously rejects Jackson’s theses, and the 2010 edition of his book does not even mention Christine Mathieu’s 2003 study, *A History and Anthropological Study of the Ancient Kingdoms of the Sino-Tibetan Borderland - Naxi and Mosuo*, which explicitly sets out to explore the historical relationship between the Na and Naxi.

Some aspects of Jackson’s study, such as the discussion of the Naxi writing systems, clearly call for major revisions in light of more recent documentation. It must be remembered that much greater amounts of material are now available than at the time of Jackson’s study; this goes a long way towards explaining occasional mistakes, such as the interpretation of the Naxi name of the Na, /lyɿ-çiɿ/ (romanized as *Lü-khi*), as “the people of Lü, the Chinese name for the area” (p. 36), when it actually means ‘the people of the Centre’, and is an exact parallel (cognate) to the Na endonym /hiɿ-hĩʃɿ/. Also, some formulations are deliberately provocative: Jackson likes to sketch Naxi history in broad strokes, emphasizing decisive junctures such as the year “1723 A.D. when the Mu family was ignominiously

dismissed and the area was ‘nationalized’ by the Chinese” (p. 35). During that year, Lijiang was placed under direct Chinese rule and the Mu 木 family of feudal lords who had ruled the area since the Yuan dynasty ceased to exercise any real control. This is undoubtedly a major landmark in Naxi history. However, one may want to emphasize that the deliberate introduction of Chinese culture and Confucian ideology had begun much earlier: the Mu feudal lords’ unswerving allegiance to China dates back to the beginning of their rule, in the 14th century. Viewed in this light, the integration of Lijiang into Chinese territory in the 18th century is the outcome of decisions that were made by the ruling family several centuries earlier. Despite this, Jackson’s overall synopsis of divergence between the Naxi and Na remains a useful starting-point. Several major ethno-historic hypotheses in Jackson’s and Mathieu’s thought-provoking studies appear well worth pursuing.

Again adopting the linguist’s (admittedly narrow) perspective, a careful examination of kinship terms in Naxi suggests that terms for relatives on the father’s side are mostly borrowings (not to mention terms directly related to marriage, such as ‘husband’, ‘wife’, and ‘daughter-in-law’), whereas the terms for relatives on the mother’s side are of greater antiquity. Viewed in this light, the hypothesis of a gradual divergence in terms of family structure as the Naxi underwent growing Chinese (Confucian) influence should not be lightly dismissed (Jackson’s phrasing, p. 37: “This is the missing key to the confusion on Na-khi kinship: legal patrilinearity yet traditional matrilinearity”). Reflections upon possible paths of evolution of the social structures in the entire area certainly hold promise for increasingly refined research on these topics.

1.3.5. Studies of the impact of tourism since the 1990s

Since the 1990s, tourism has developed at a staggering pace in the Yongning Na area. A number of books, both in Chinese and in Western languages, cater for the tourist industry by presenting idealized pictures of Na society against its beautiful background: Lugu Lake and the Yongning plain (e.g. Refflet 2006; 拉木•嘎吐萨 1998). There also exists abundant literature on the effects of tourism on Na society. Foreign sociologists and anthropologists often take a highly critical stance, pointing out that “official representations of China’s ethnic minorities have created an image of minority people as dangerous, feminine, and erotic”, and that, in the case of the Na/Mosuo, “early state categorizations of Mosuo gender practices have

led to representations of Mosuo ethnicity built around notions of women freely available for sex, to whom present lovers have no future commitments, or of a land where women rule. Matriarchy and sexual availability are central in tourists' desire to visit the Mosuo" (Walsh 2005:449–450). These researchers bring to light the ironic reversal whereby "the cultural characteristics the Maoist government tried to change became celebrated as markers of Mosuo cultural uniqueness and value" (ibid., 457).

For obvious reasons, publications by scholars in mainland China refrain from such criticisms, and typically formulate proposals for striking a reasonable balance between the competing demands of economic development and the protection of tradition. Their perspective is in line with the national mottos of economic development, on the one hand, and preservation of social harmony, on the other. Nonetheless, these publications contain a wealth of information: see, for example, the 2007 collection of articles by Mosuo scholar 拉木·嘎吐萨 (Lamu Gatusa). In addition, articles in Chinese about the Na/Mosuo published from 1960 to 2005 have been collected in a two-volume set (Latami Dashi 2006), organized by themes (Vol. I: ethnology and anthropology; Vol. II: language, customs, religion, culture, music, and book reviews), which contains a bibliography. This edition has some minor limitations, such as incomplete information about the original publication references of work reprinted in the collection, and typographical errors for Latin characters and International Phonetic Alphabet transcriptions. For critical overviews of Chinese scholarship, see Knödel 1995 and 何撒娜 2008.

1.4. Previous studies of the Na language

1.4.1. Fu Maoji 1980: a study of kinship terms

Like anthropologists, linguists visiting Yongning have been intrigued by the Na family structure. Fu Maoji visited Yongning in May and June 1979 with He Jiren and Jiang Zhuyi. He collected data in the village of /dzɤŋbɤt-ɛwɤŋ/ (Jiabowa 甲波瓦) and wrote about kinship terms; his presentation at the 12th International Conference on Sino-Tibetan Languages and Linguistics (Paris, 1979) was then published in Chinese and French (傅懋勣 1980; French version: Fu Maoji 1983).

1.4.2. He Jiren and Jiang Zhuyi 1985

He and Jiang's 1985 book includes a word list of the Yongning dialect, as well as some observations on phonology, syntax, and dialectal diversity (*ibid.*, pp. 107-116; see also Jiang Zhuyi 1993).

The transcription is not phonemicized, and may not be fully consistent. Only four tones are transcribed over monosyllables: LM (ɿ), M (ɿ), ML (ɿ), and H (ɿ), whereas the analysis presented in this volume brings out six categories (see Chapter xyz). He and Jiang based their linguistic research on an analogy with Naxi, a language which both of them could speak (He Jiren as a native speaker, Jiang Zhuyi as a gifted second-language learner). Naxi has a four-way tonal opposition over monosyllables: High, Mid, Low (realized phonetically as low-falling, and transcribed as ɿ by He and Jiang), and Rising. When listening to Yongning Na, they failed to distinguish the two types of rising tones, LH and MH, although these are distinct even when a word is spoken in isolation. Moreover, they listened for a difference between M and H tones, which in fact does not exist. Of course, it may also be that the dialect that they investigated differs considerably from that spoken by the consultants who collaborated with me, but judging from the great phonetic proximity between their word list and mine, this is not particularly likely. On the other hand, it is not uncommon for phonemic and tonal analyses based on data collected during short field trips to differ greatly from one author due to incomplete phonemicization of the data (as pointed out by Matisoff 2004:329). For example, for Shixing/Shuhing, Sun Hongkai 1983 reports 58 initials, whereas Huang Bufan and Renzeng Wangmu 1991 report 43, for two sub-varieties which are mutually intelligible (Chirkova 2009).

Returning to tones M and H in Yongning Na, in the language variety described here, the two tones are neutralized to M in isolation. Phonetic realizations of this tone (which, under a Praguian approach, would be referred to as an architoneme) vary freely in the upper half of the speaker's tonal space, so that an investigator who starts out from the hypothesis that there exist H-tone monosyllables and M-tone monosyllables can readily hear differences in pitch that seem to support the hypothesis. The same process of pre-existing assumptions affecting linguistic observation happened to me in the early stages of my research: in my initial transcriptions, there were H-tone words and M-tone words. I later discovered that there was no such opposition in isolation. The phonological M and H tones of Yongning Na can only be brought out by placing the words in context, e.g.

adding the copula (as explained in Chapter xyz). The distinction between H and M tones made by He and Jiang on the basis of citation forms is thus spurious (unless, as mentioned above, there is a considerable gap between the dialects at issue). ‘Field’, glossed as ‘earth (地)’, is transcribed with a High tone: /lɿ̌/, when in fact it carries Mid tone: /lɿ̃/. ‘Man’ is transcribed as /xĩ̃/, with M tone; this is indeed the tone that the word carries in isolation, but its behaviour in context reveals that its lexical tone is H (my transcription: /hĩ̌/).

The distribution of Low(-falling) and Low-rising tones in He and Jiang’s data is a puzzle to me, since no monosyllables are pronounced with Low tone in isolation in the language variety that I investigated. Examples include ‘plain, flatlands’, ‘water’ and ‘goose’, transcribed as /dy̌̌/, /d̥zǐ̌/ and /ǒ̌/; these three items have different tones in my data: LH tone for ‘plain’, L tone for ‘water’, and LM for ‘goose’. My best guess at present is that, in the speech of He and Jiang’s consultants, L was a (relatively infrequent) free variant of LH in citation form. It is also possible that the word list combines data from several speakers, and is not dialectally homogeneous. The Naxi data in the same volume are a case in point: the authors present the data as coming from the dialect of the township of Qinglong 青龙 (present-day Changshui 长水), the home of Jiang Zhuyi’s teacher He Zhiwu 和志武; but some data were contributed by He Jiren on the basis of his native dialect, Yangxi 漾西. In the absence of indications about the origin of individual pieces of data, it is extremely difficult to determine which data come from which dialect.

There are also some issues with He and Jiang’s transcription of vowels and consonants, as is to be expected of initial field notes. Nasality is transcribed only in the syllables /xĩ̃/ (as in ‘man’, transcribed /xĩ̃/; my data: /hĩ̌/) and /ɣ̃r/ (the only example is ‘bone’, transcribed /ʂǎɣ̃r/; my transcription: /ʂæ̌ĩ̌/). The fieldwork reported in the present volume brings out eight nasal rhymes. He and Jiang do not transcribe the uvular consonants reported in Chapter xyz of this volume. Such discrepancies may be due to the fact that the variety described by He and Jiang had fewer phonemes than that described here; but it is not implausible that they failed to distinguish some sounds that were in fact phonemic.

Conversely, some differences transcribed by He and Jiang are likely to be spurious. The word list contains examples of /li/ (as in /lǐ/ ‘to look’), /lie/ (such as /liě̌/ ‘tea’), and /le/ (as in /ɲǎlě̌gɣ̌̌/ ‘daytime’). In my data ‘tea’ and ‘to look’ have the same initial and rhyme; the vowel /i/ is slightly diphthongized towards [e], and thus close to [li^e], which explains why it

could be sometimes transcribed as [i] and sometimes as [ie] before the investigator's ear attunes to the vowel system of Yongning Na. Of course it is also theoretically possible that these two words did not have the same phonemes in the dialect investigated by He and Jiang. As for the syllable /le/ in /ɲa˥le˥gy˥/ 'daytime', it is to be analyzed as the ACCOMPLISHED, /lə˥/, whose phonetic realization [le˥] is regular given the /y/ vowel of the following syllable. Of the three syllables /li/, /lie/ and /le/, only the first is an attested combination in Yongning Na.

1.4.3. *Yang Zhenhong 2009*

An outline of Yongning Na was published by Yang Zhenhong 杨振洪, a speaker of this language from /ə˥bv˥˥-ɬwɣ˥˥/ village: 阿布瓦村, close to the current location of the Yongning high school (original publication in Chinese: Yang Zhenhong 2006; English translation by Liberty Lidz published as Yang Zhenhong 2009). This outline by and large follows the structure of He and Jiang's description of Naxi. Some parts of the discussion of phonetics and phonology may require further analysis: among consonants, uvular and retroflex stops are not granted phonemic status; concerning the tones, the analysis is based on the four tones found in Naxi (like the analysis by He and Jiang, discussed in the previous section), which entails some shortcomings. Informal discussions with the author suggest that there are in fact more tone categories in the dialect at issue. Like many other researchers, Yang Zhenhong uses descriptive tools developed for syllable-tone systems such as those of Sinitic languages, which are not adequate for Na. (A similar problem was encountered in studies of Prinmi/Pumi, where advances were finally realized by researchers with a knowledge of other types of tone systems, such as those of Japanese dialects: see Ding 2001, 2006 and Jacques 2011.)

1.4.4. *Liberty Lidz 2010*

By far the most thorough description and analysis of Yongning Na to date is Liberty Lidz's Ph. D. dissertation (Lidz 2010), *A descriptive grammar of Yongning Na (Mosuo)*. It concerns the variety of Yongning Na spoken in the village of Luoshui 落水, on the shore of Lugu lake. The dissertation, based on in-depth fieldwork, contains 250 pages of fully transcribed and annotated narratives and includes an in-depth description of the morpho-

syntax of the language. Many of the glosses that I use take up labels proposed in this dissertation.

As a final remark about previous studies, the present book supersedes articles and data sets that I published earlier, in particular the phonemic and tonal analysis published in 2008 (Michaud 2008) and the version of the vocabulary list deposited at the STEDT archive in 2011.

1.4.5. Collections of oral literature: Na ritual texts

In Yongning, along with a full-fledged Buddhist religious system, there exist ritual practitioners, called /daɿpɣɿ/. The rituals are not written, unlike those of the Naxi – although some written characters are used for computing days in divination: see Yang Xuezheng (1985). The absence of a written form explains in part why these rituals have attracted less attention than the Naxi rituals; the much smaller size and socio-political weight of Yongning as compared with Lijiang, and the difficulty of access to the area until the late 20th century, also go a long way towards explaining why there were few efforts towards collection of this aspect of the Na oral tradition. A small bilingual collection was published in 201*; it contains a transcription in a romanization system inspired by Chinese *Pinyin* (zzzz cite and discuss). Recently, Latami Dashi and Yang Liquan are conducting extensive video recordings and aim to publish a collection of translated and annotated texts with accompanying video.

In-depth study of these traditions, and comparison with Naxi rituals, holds great promise for an understanding of Na culture; this study would require a good command of Tibetan traditions, and other skills way beyond the author's field of expertise. Only a few piecemeal observations from field notes are offered here.

Twentieth-century reports suggest that monks and /daɿpɣɿ/ cohabited peacefully, with an established division of labour: e.g. one would call the /daɿpɣɿ/ to perform a ritual when killing pigs, the monks on specific days of the calendar, and both monks and /daɿpɣɿ/ for the most important events, such as funerals. This peaceful coexistence, and the occasions for contact offered by the rites where both participated, apparently resulted in a measure of convergence. The Na /daɿpɣɿ/ appear to be influenced by the highly ritualized behaviour of Buddhist monks. They prepare their rituals with an attention to detail that approaches that of Buddhist monks, asking for all the necessary paraphernalia in advance (butter, different types of flour, candles, water...). By contrast, the Yi ritual specialists (called 'Bimo' in Chinese),

who do not usually practise have a habit of requesting objects and accessories suddenly, in the midst of the ritual, as if acting on their inspiration, on the spur of the moment. The gestures of the /daɪpɣɪ/ also come to resemble those of monks. Conversely, some monks are reported to learn the Na horoscope – one of the fields of competence of the /daɪpɣɪ/.

2. The aim of the present volume: to provide an in-depth description of an East Asian level-tone system

2.1. Why Yongning Na tone calls for in-depth description

The complexity of the Yongning Na tone system is immediately apparent when studying entire sentences. Sentences (1a) and (1b) provide an illustration.

- (1) a. njɣɪ biɪ-zoɪ-hoɪ.
 njɣɪ biɪ_c zoɪ hoɪ
 1SG to_go OBLIGATIVE FUT(/DESIDERATIVE)
 ‘I have to go. / I’m afraid I have to leave.’ (Field notes, 2006)

- b. njɣɪ ziɪ-biɪ-zoɪ-hoɪ.
 njɣɪ ziɪ_a biɪ_c zoɪ hoɪ
 1SG to_take to_go OBLIGATIVE FUT(/DESIDERATIVE)
 ‘I have to go and take [my luggage] now.’ (Field notes, 2006²)

The difference in the lexical tone on the main verb (in 1a: /biɪ_c/ ‘to go’, lexical tone category: M_c; in 1b: /ziɪ_a/ ‘to take’, lexical tone category: L_a) is reflected in the tones of the following syllables, all the way to the end of the sentence. Examples (1a-b) will be returned to in the conclusion of this

² This is the first sentence of Yongning Na that I transcribed. The context is as follows: I had just arrived at my future teacher’s house; my luggage had been left at someone’s house along the main street of Yongning. I asked my teacher’s son, who can speak fluent Mandarin, to translate an explanation for me: “I have brought a lot of stuff; I have to go back [to the main street] and pick it up now”. This yielded (1b). Later I elicited (1a) as a simpler form.

volume, explaining the processes by which their surface-phonological tonal strings obtain.

Such phenomena are reported in the linguistic literature about Yongning Na: it has been observed that the language has “tone sandhi, (...) which seems to be at least partly morphologically motivated” (Lidz 2006:4); the presence of tonal changes is also mentioned by Yang Zhenhong (2009). These authors did not work out the underlying system in detail, however.

Tonal changes permeate numerous aspects of the morphosyntax of Yongning Na; importantly, they are not the product of a small set of phonological rules, but of a host of rules that are restricted to specific morphosyntactic contexts. The complexity of this aspect of the language calls for a book-length description, applying “the old philological virtue of exactitude” (Scherer 1885:152) to this hitherto little-described system, in order to arrive at a reasonably comprehensive account.

As I looked around for full-fledged, book-length descriptions of similar systems in other languages, to serve as points of reference to approach morphotonology in Yongning Na, I realized that such reference works were relatively scarce. An obvious place to look seemed to be the extensive Bantu branch of the Niger-Congo family of languages, famous for the richness of its morphotonology, among other fascinating aspects.

Theoretical linguistics is primarily concerned with advancing the theoretical enterprise, and tends to produce short pieces – chapters, articles, squibs. It does not have the writing of grammars as a priority, and few of the theoretical grammars of African languages written during the heyday of transformational theory during the 1960s and 1970s have stood the test of time. (...) Are there enough grammars of sub-Saharan African, especially Bantu, languages? The answer is no. (...) The overwhelming impression is that of the small number of real grammars, and the number is not increasing. (Nurse 2011:xxiii–xxiv)

In addition to quantitative scarcity, there is also an issue of breadth and depth of coverage for those languages that have been the object of book-length descriptions. Citing, again, Derek Nurse: “Even the ‘well described’ languages often suffer from a lack of examples, by which to test the descriptive or theoretical claims” (Nurse 2011:xxiii; the need for in-depth descriptions is likewise emphasized by other Africanists, including Hyman 2005; Clements 2000).

In the field of Sino-Tibetan studies, there is a long-standing tradition of in-depth language monographs. But languages with level-tone systems and a rich morphotonological system have not yet been studied extensively. In

view of this situation, it appeared useful to produce a book-length description of Yongning Na tone: as a worthwhile pursuit in its own sake, as part of documentation and research on this endangered language; and also as an example of a level-tone system in the Sino-Tibetan family.

2.2. Theoretical backdrop

The theoretical backdrop to the present research is intended to be as unobtrusive as possible. This book is meant to be an in-depth description of the language's phonology. The aim is not to bring cherry-picked data to bear on topical issues in phonetic/phonological debates. It may nonetheless be useful to provide some information on the broader research agenda behind the present case study.

2.2.1. *Functional phonology*

The method used here essentially rests on the basic principles of classical functional phonology, as set out in introductory textbooks on phonological description (for instance Martinet 1956:15, 34–47). No claim is made to theoretical orthodoxy, however; the overarching guiding principle is to exercise the greatest vigilance to avoid Procrustean models. In the present description of Yongning Na, efforts were made to keep in mind issues of psychological (cognitive) plausibility. Generalizations over the data (“phonological rules”) should be formulated so as to approach the actual processes taking place in the speaker's brain. Needless to say, there remains a considerable gap between the model and the actual cognitive processes, and it would be necessary to devise specific experiments to make further progress towards this goal.

2.2.2. *Autosegmental phonology*

Some concepts used in the tonal analysis are drawn from autosegmental models (models in which the tones are AUTOnomous from the SEGMENTS: vowels and consonants), which were originally developed for Subsaharan tone systems but have been convincingly applied to certain Tibeto-Burman languages (see, in particular, Hyman and VanBik 2002). The choice of these descriptive concepts is motivated by language-internal evidence; it is by no means dictated by a priori theoretical commitments. I am fortunate to be familiar with a few strikingly different tone systems of Asia: that of

Yongning Na, which has phonetically simple and morphophonologically complex tones; and those of Vietnamese and Mandarin Chinese, which have phonetically complex and morphophonologically inert tones. To me, it is clear that Yongning Na is to be described as having a level-tone system, unlike Vietnamese in which “there are no objective reasons to decompose [...] tone contours into level tones or to reify phonetic properties like high and low pitch into phonological units such as H and L” (Brunelle 2009; see also Brunelle, Nguyễn Khắc Hùng & Nguyễn Duy Dương 2010; Kirby 2010; Kirby 2011).

2.2.3. Typology and universals

Concerning typology and universals, I fully adhere to the following conclusions:

...languages may differ at virtually all levels in their process of categorisation – not only in how they group sounds into emic categories (phonemes) but also in the way their particular constraints group these phonemes into meta-categories (classes of phonemes). These constraints, in turn, have to be defined system-internally, even when they derive from such supposedly universal parameters as sonority. Haspelmath (2007:129) reminds us that “structural categories of language are language-particular, and we cannot take pre-established, a priori categories for granted”. Such a stance does not rule out the possibility of universal generalisations, but entails that they can only be based on the empirical study of language-internal structures, and the acknowledgment of cross-linguistic diversity. (François 2010)

These conclusions by no means amount to a relativistic claim that each language is different and calls for a distinct approach and distinct concepts. On the contrary, they open into a programme for comparative work that emphasizes cross-language similarities in functional terms, and in terms of evolutionary potential, instead of static characteristics. This aspect is developed in the following paragraph under the heading of Panchronic Phonology.

2.2.4. Panchronic Phonology

Although the focus of the present book is on synchronic description, this description is supplemented by comparative and diachronic observations – an approach advocated by Martinet under the name of “dynamic synchrony” (Martinet 1990). Beyond case studies, this approach aims to

assemble data that lead to an inventory of common types of sound change and to an improved understanding of the conditions under which they occur. The most ambitious formulation of this programme has been provided by André-Georges Haudricourt under the name of Panchronic Phonology. This approach is described below in a brief discussion of Evolutionary Phonology and structural approaches to diachronic phonology.

Evolutionary Phonology, building on Ohala 1989, considers phonetic variation to be the primary source of phonological change (Blevins 2004; Blevins & Wedel 2009; also Smith & Salmons 2008). This emphasis on phonetic bases of change encourages a continuous and mutually profitable dialogue between experimental phonetics and historical phonology. However, the role played by phonetic factors may be slightly overestimated by this approach. Let us take nasality as an example. The temporal extension of nasality typically exceeds the duration of one single segment in ordinary speaking style: from a phonetic point of view, nasality tends to spill over neighbouring segments. Velum lowering tends to be anticipated, and nasal airflow tends to extend beyond the nasal segment. The aerodynamic study of the variability of nasal sounds in spontaneous speech brings out numerous cases of anticipation and carryover of nasal airflow, including an overwhelming proportion of cases of nasal carryover in NV sequences (Basset et al. 2001 on French). There is no reason to think that nasal consonants were any less phonetically variable in the past history of the Romance languages; however, despite the considerable potential for change revealed by phonetic studies, initial nasals are stable throughout their recorded history.

Hypothesized universals of language change based on phonetic properties seldom stand close scrutiny. Competing phonetic tendencies exist, and they do not have explanatory or predictive power when it comes to individual cases (Labov 1994:601; and the critical assessment of Evolutionary Phonology by Andersen 2006:168–171). Clearly, the existence of a pool of phonetic variation is only part of the thoroughly complex story of diachronic sound change. Structural approaches to diachrony study the way in which phonological systems respond to the causes of change (in particular Martinet 2005). A major source of change is the constant competition between the tendency towards phonological integration on the one hand and the tendency towards phonetic simplicity on the other. Phonological integration tends to fill structural gaps in phonological systems, while phonetic economy tends to create phonological gaps. A simple example can be drawn from tones: having five level tones (Top, High, Mid, Low, Bottom) is phonologically economical, as tone alone allows for numerous lexical

distinctions, and the combinations of the five levels open up immense morphophonological possibilities. But this is phonetically uneconomical, because the distinction between a large number of tones is perceptually difficult, e.g. distinguishing sequences such as Top+High, Top+Mid, and High+Mid.

Out of the pool of potential changes, the actual direction of evolution observed in a given language depends in part on the state of its phonological system, e.g. – again taking tone as an example – which tones it possesses, which phonotactic constraints they are subject to, and what functional load they have in the system.

Ultimately, what is needed is an approach that attempts to formulate generalizations about sound change that are independent of any particular language or language group. Haudricourt labels such an approach Panchronic Phonology (Haudricourt 1940; Haudricourt 1973; see also Hagège & Haudricourt 1978). Panchronic laws are obtained by induction from a typological survey of precise diachronic events whose analysis brings out their common conditions of appearance. In turn, these laws can be used to shed light on individual historical situations.

Let us consider two examples of panchronic regularities.

The first is from Haudricourt's programmatic 1940 article: there is a potential for the change from word-initial /st-/ to V(owel)+/st-/ when the following four conditions are met: (i) initial /st-/ is not significantly more frequent than V+/st-/; (ii) V+/st-/ is allowed in word-final position; (iii) there is no word-initial stress; (iv) if the word where the change is to occur has N(umber) syllables, words with N+1 syllables must be allowed in the language.

The second example of panchronic regularity is the transphonologization of the voicing opposition among initial consonants (Haudricourt 1965; Ferlus 1979). After evolving into an opposition between phonation types on the following vowel (breathy voice vs. modal voice), this opposition becomes tonal if the language already had tones (creating a split in the tone system); otherwise it becomes a vowel quality opposition, creating a two-way split in the vowel system. This model is verified in numerous East and Southeast Asian languages; it has also been applied to the reconstruction of Old Chinese, supplementing the model to include oppositions between single and geminate onsets as another diachronic source for phonation-type register oppositions (Ferlus 2009).

The term 'panchronic' is adopted to describe the approach used in the present volume, because I consider that the explicit research programme

defined by Haudricourt holds promise of an increasing degree of precision and explicitness in modeling historical change. The aims and methods of many researchers in historical phonology are actually close to this programme (see, e.g., Jacques 2011b; and the detailed epistemological discussion by Mazaudon & Michailovsky 2007). Labov's generalization that "(i)n chain shifts, peripheral vowels become more open and nonperipheral vowels become less open" (1994:601) can be considered as a panchronic statement: it aims to explain synchronic states in terms of the processes that lead up to them, and to arrive at general laws of sound change. I believe that, in practice, these common goals are more important than theoretical differences, and that practitioners of Panchronic Phonology, Evolutionary Phonology or other approaches to historical phonology would draw essentially the same conclusions from the data and analyses in the present book.

3. Chronology of the study, elicitation procedures, and online materials

The present results are based on data collected since 2006.

Four field trips to Yongning were conducted. Excluding the time spent on travel and on organizational tasks in Kunming and Lijiang, the duration of these stays was: 50 days in 2006; 35 days in 2007; 58 days in 2008; and 40 days in 2009.

3.1. Collaboration with consultants

On the first field trip, Mr. Latami Dashi, a native speaker of Na and a researcher in ethnology based in the Ninglang county seat who had been introduced to me by Picus Ding, accompanied me to his family's house, where I was invited to reside during all my stays in Yongning. He volunteered to work as consultant. (His code in the database of Naish speakers is M18.) Mr. Latami has near-native command of both Southwestern Mandarin and Standard Mandarin; it was immediately obvious to both of us, when we began an elicitation session, that long years of daily practice of Mandarin had taken their toll on his proficiency in Na. He proposed to find a speaker who had a relatively homogeneous linguistic experience, having lived continuously in Yongning since childhood. For my part, I wanted to work with a male speaker, for phonetic reasons: spectrogram reading and electroglottographic analysis, two techniques in which I had some experi-

ence, are easier to perform on data from male speakers. Also, we agreed to look for a speaker whose age ranged between 35 and 65. Younger speakers have limited command of the language; the oldest speakers are often the least bilingual and hence the most proficient speakers of Na, but at a certain age speech becomes less audible and communication with strangers more difficult.

Mr. Latami therefore set out to look for a suitable consultant in the neighbourhood. The procedure as he narrated it to me was the following. He invited a candidate over to his place after dinner. Mr. Latami Dashi treated him to wine and sunflower seeds, and launched a conversation about how the language was being lost by the younger generation. Then he explained that there was currently a foreigner staying in the house, who wanted to study and record the everyday language; and he asked if the person would agree to work as language consultant.

Several persons were thus invited, said they would consider the proposal, and finally declined. There may have been a number of various reasons for this. Mr. Latami's point of view is that, for want of knowing the ins and outs of linguistic fieldwork, they were suspicious of potential misuses of the information that they would provide, and wary of the blows that their reputation would suffer if their name became associated with debatable materials about Na language and Na culture. There are enough examples of ludicrously simplified portraits of Na culture produced to cater for the tourist industry (as reviewed in 1.3.5) to justify their cautious stand.

On the other hand, these people have known Mr. Latami since he was a child, and they would have reasons to trust him not to recommend someone lightly, or collaborate in a research project that may harm the image of the community. In his own research on Na/Mosuo culture, Mr. Latami takes care to gather viewpoints from a number of community members before one of his books goes to press. After he has finalized a draft of one of his books (e.g. 拉他咪·达石 2009), he will circulate copies to Na people who are literate in Chinese and ask for their comments. Only after he has received their criticisms, corrections and comments, and worked them into the final version, does the book go to press. While this offers no absolute guarantee against resentment on the part of other community members, it could go some way towards allaying suspicions.

These Na speakers' negative answer can be considered as providing an insight into traditional Na society, as a highly conservative agricultural society where deviant behaviour meets with sharp reproach. This has a strong bearing on language: according to linguists specializing in the study

of relationships between society and language, conservative societies favour not only archaism, but also the development of innovations that tend to complexify morphology – a process opposite to what happens in cases of creolization. For instance, reflecting on the case of the development of person agreement marking on complementizers in Bavarian German (reported by Bayer 1984), Peter Trudgill speculates that this can only happen in tightly-knit, rural communities. The example given is the following:

...obst du noch Minga kummst
whether you-sg. to Munich come ‘whether you are coming to Munich’

where *ob* ‘whether’ receives second-person agreement *-st* (Trudgill 2011:82, 112–113). To return to Yongning Na, the development of the flamboyant tonal morphology described in the present volume may have been favoured by the same social factors that initially led potential consultants to decline sharing their knowledge of Na with me.

Mr. Latami Dashi’s mother seconded her son’s efforts to convince potential consultants that they should not be intimidated by the tasks proposed to them, explaining that the purpose was not to collect folklore, but to study the everyday language; and that the initial stage of the work was as simple as saying the words for ‘head’, ‘hand’, and so on. While she did not succeed in convincing others, she apparently convinced herself, and volunteered as consultant.

3.1.1. *Main language consultant: Mrs. la-t^ha-mi* [æ-t^hsw-t-la]mv]

My Na language teacher, whose code in the database of speakers of Naish languages is F4 (fourth female speaker), was born in 1950 in the hamlet called /ə-t^hla-t-ɛwɣ#/ in Na, close to the monastery of Yongning, called *dgra med dgon pa* in Tibetan, a name rendered in Chinese as Zhāměisi 扎美寺. The administrative coordinates of this village are: Yúnnán province, Lǐjiāng municipality, Nínglàng Yí autonomous county, Yǒngníng district, Ālāwǎ village (云南省丽江市宁蒗彝族自治县永宁乡阿拉瓦村). The founding of this village is narrated in the online narrative *Elders3* (about online resources: see section 3 below). My teacher later established a home of her own in a neighbouring hamlet, slightly closer to the Yongning marketplace.

My teacher is attached to traditions, closely associated with the teachings of her grandmother, an outstanding character who tactfully managed a

large household. In narratives, she refers to her grandmother as /əɬsiɬ/, ‘great-grandmother; ancestor of the third generation’, the term of address used by her own children – a way to point her out to the next generation as a living model. My teacher is considered locally as a connoisseur of Na customs: in recent years, when someone in the village had doubts about how a certain ceremony should be performed, they would come to ask her for instructions.

On the other hand, she is well aware of how deeply the staggering pace of change since her birth has transformed Na society, and she does not cling to a bygone past. She is an open-minded character, gaily deriding in retrospect the prejudices that used to prevail in Na communities. Among the anecdotes not committed to digital memory in audio form is one about the introduction of vegetables such as courgettes and eggplant in Yongning: distrustful and indignant villagers would warn one another, “Don’t eat those: they are grown in shit!” But these new crops were eventually adopted, along with traditional Chinese methods for fertilizing soil.

In her childhood, she was one of the actors in a documentary film about the Na and their unusual family structure (*‘A-zhu’ marriage among the Naxi of Yongning*, a film realized as part of a series of scientific documentaries about “ethnic minorities” initiated in 1957: 少数民族社会历史科学纪录片)³. Later, one of her sons became an anthropologist, specializing in Na society, and she was visited by a number of his colleagues. She thus witnessed how the Na of Yongning became an object of curiosity and fantasy, and how Na culture became folklorized for the promotion of the tourist industry with its pleasant sides and its less lovely ones.⁴ These experi-

³ Chinese title: 《永宁纳西族的阿注婚姻》. Black and white. Duration: about 60 minutes (6 film portions of 10 minutes each). Production date: about 1966. Advisor: Qiū Pǔ 秋浦. Scenario: Zhān Chéngxù 詹承绪 and Yáng Guānghǎi 杨光海. Director: Yáng Guānghǎi 杨光海. Photography: Yuán Yáozhù 袁尧柱. Sound recording: Zhào Déwàng 赵德旺. Animations: Zhèng Chéngyáng 郑成杨. Narration: Zhōu Qīngyú 周庆瑜. Chinese summary: “在云南省宁蒗彝族自治县永宁公社的纳西族, 解放前处于封建领主社会, 但长期以来还保存着原始母系社会特征, 保存着以母系为核心的母系家庭, 保存着男不娶, 女不嫁的“阿注婚姻”。男阿注到女阿注家过夜, 晚上来白天走的“半同居”婚姻生活。本片对这种婚姻形式, 特点和母系家庭作了如实的记录。”

⁴ One example among many is a report done for the French tabloid *Paris Match*: its special issue “China is changing” (“La Chine change”, May 2001), contains no less than ten pages dedicated to the “Mosuo” (pp. 52-61), including an interview with Latami Dashi and his mother Latami Dashilame (p. 60).

ences gradually shook some of the traditional beliefs that had been passed on to her by her grandmother, such as Buddhist beliefs. While conscientiously going through the prescribed rituals on a day-to-day basis, her own belief in Buddhist teachings such as reincarnation was faltering, although without affecting her commitment to the ideals of benevolence and respect of others. The narratives recorded show her awareness of the cultural relativity of the waning customs and traditions of the Na, to which she remains deeply attached nonetheless.

Unlike more traditional parents in whose view the monastery was the most prestigious prospect for boys, she encouraged her children – girls as well as boys – to study in the Chinese school system, which she felt was a better gateway to an existence free from daily toil in the fields. Her four children have all found employment outside Yongning, one of them in the county town of Ninglang, two in Lijiang, and one in faraway Shenzhen (Guangdong). Although she lived continuously in the village since her birth, and very rarely left the plain of Yongning (and, indeed, seldom left her village) until she came over to the city of Lijiang to look after a newborn granddaughter in 2010, she was always well aware of the world beyond Yongning.

Her experience that the human heart is the same everywhere, below the surface of local customs, surfaces in places in the narratives that she agreed to record in the course of our collaboration. She likes to point out similarities between the situations described in her narratives and present-day situations. For instance, mentioning apprentice monks' hopes to find a good master, she brought out the analogy with my study of Na, for which I likewise needed attentive teachers, as did her grandson at the university in Kunming. Following her instruction, I have always called her /əˈməː/, and have been the grateful object of her affectionate care throughout my stays. She is a model of tact, masterfully fine-tuning relations within the family and beyond. She has been an admirably patient and encouraging teacher, despite her declining health and her heavy workload as a mother and a grandmother.

Currently standard procedures for data collection, as reflected in the 'Method' section of papers in phonetics journals, tend to avoid any mention of personal contacts between the investigator and the subjects. Such mentions would be worse than irrelevant, they would be suspicious, since exchanges with consultants beyond providing explicit instructions are viewed as a contaminagen, a threat to the objectivity of the experiment. However, to linguists who have an experience of working in collaboration with con-

sultants, whether in a language lab or in the field, it is clear how deeply the relationship established with the consultant influences research. A close look at data collection in language laboratories suggests that important dimensions in the selection of speakers and the formulation of instructions are often overlooked. Worries are seldom voiced about the bias introduced by the use of professional linguists, or multilingual students, as subjects. “The subjects were unaware of the purpose of the experiment” is considered a commendable state of affairs. Of course, different research purposes call for different data collection methods, and it would be thoroughly unreasonable to expect all investigators to develop strong personal familiarity with subjects who participate in their research. Nevertheless, it is clear that, in the process of describing a language, mutual understanding between the investigator and consultants is of the essence. In this light, the above personal information and personal statements are not simply fieldwork anecdotes, or idolatrous worship of consultant F4 as “guardian Angel, Muse and Madonna” (“l’Ange gardien, la Muse et la Madone”: Baudelaire 1857:88): in my view they represent relevant information on data collection.

Still on the topic of personal data concerning the main consultant (F4): she was a stutterer during her adolescence. She later overcame this difficulty. I may not have noticed had I not been informed, but I now interpret the rare cases of stuttering that occur in narratives as remnants of this earlier difficulty. Also, she is known in the community as a person who talks quickly. Finally, although she has never suffered from any major otorhinolaryngological ailments, she has noticed changes in her voice over the years, and is no longer able to sing the high-pitched songs of the Na.

She occasionally conversed with Na speakers from other villages, but never travelled to Na villages outside the Yongning plain, such as Labai or the Na villages in Muli county (see map on page xyz). She can speak a little Southwestern Mandarin Chinese, and occasionally borrows common Chinese words when speaking Na, but her proficiency was very limited until she moved to Lijiang in 2010 and found herself in a predominantly Chinese-speaking environment. She does not know other languages of the area, such as Prinmi (Pumi), Lisu, Naxi, or Yi, although since she moved to Lijiang she has relatively frequent contacts with Naxi speakers.⁵ Apart from

⁵ The study of the subtle effects of language contact on her practise of Yongning Na would warrant a monograph by themselves. Here is an example. The Naxi are referred to by the Na as /naJhĩ#/, by a calque of the word structure of the Naxi word /naJçi/, made up of an endonym (/na/) which is segmentally identical in

initial vocabulary elicitation, which was done in Chinese, fieldwork was conducted in Na, the consultant providing explanations in her own language, without translation into Chinese. This certainly made the elicitation process slower than it would have been with a bilingual consultant, but monolingual fieldwork also has its advantages, allowing the investigator to develop a better command of the language.

3.1.2. *Other language consultants*

During the first field trip (2006), as work with consultant F4 began, I reflected on possibilities to extend the work to other speakers. There are strong argument for working with several speakers.

Data from varied sources can guard against distortions resulting from dressage, the observer's paradox, faulty questioning, or prescriptive influences of one individual's idiolect. Working with several speakers will provide the researcher with points of comparison so that he or she can learn to distinguish between reliable and unreliable data. (Chelliah & de Reuse 2011:180–181)

In the family where I stayed, two members were living in Yongning all the year round: F4, and a daughter-in-law: the wife of her second son. Her daughter-in-law (speaker code: F5), born in 1973, accepted to act as language consultant for basic elicitation, while declining to record any continuous texts: narratives, dialogues, explaining that she did not feel up to the task. Unlike F4, who after a couple of days eliciting vocabulary accepted to record a narrative, F5 maintained their initial decision not to record anything other than short responses to my questions, except for a few short songs recorded in 2007.

Both F4 and F5 had relatively little spare time, so I would work with one or the other depending on who could find the time. One day in Decem-

both languages, and of the word for 'person, human being': Naxi /çi-/ , Na /hĩ/. Accordingly, F4 used this Na pronunciation when discussing with Naxi people in Lijiang, e.g. to explain to them that she was not 'Naxi' but 'Mosuo', from Yongning. But to a Naxi listener, the realization /naJhĩ#/ does not sound right: the Naxi do not have nasalization in the syllable for 'person, human being'. Whether at Naxi speakers' suggestion, or through a spontaneous process of adjustment, F4 began to refer to the Naxi as /naJci-/ , denasalizing the second syllable. This amounts to borrowing the entire word from Naxi, instead of calquing it with Na morphemes.

ber 2007 when both were busy, F5 asked a niece to “replace” her for a work session. This offered an opportunity to get insights into the speech of the younger generation. This speaker, F6, was born in 1987. As a high school student in the Ninglang county seat, she only came back home for holidays. Vocabulary elicitation showed that she knew few words, and that her Na phonological system was highly simplified. These observations are reported in a joint book chapter with Latami Dashi: “A description of endangered phonemic oppositions in Mosuo (Yongning Na)” (Michaud & Latami Dashi 2011; Chinese translation: Michaud & Latami 2010).

In 2008, two more speakers were recorded. The first was Mr. /ho·ldzɿ·tsʰe/ (Chinese: 何甲泽 He Jiaze), hereafter M21, born in 1942. He was a retired cadre (干部), and had lived two years in Kunming and three in Yongsheng. The opportunity to extend the investigation to a male speaker was welcome; and M21 was extremely encouraging and motivated. Elicitation tasks proved highly challenging for him due to some hearing difficulties, however: he reported full deafness of one ear, and highly reduced sensitivity of the other. His experience of various dialect areas also made him more changeable in linguistic behaviour than the investigator would have wished. Specifically, it did not prove feasible to elicit consistent tone patterns for compound nouns, as some patterns that had been elicited in one session were dismissed in another, only to be reasserted with full confidence at a later point. Later, M21’s youngest son, /dzu·ldzɿ·/ (Chinese: 何独知 He Duzhi), born in 1974, kindly accepted to participate in the linguistic investigation. His knowledge of Na is comparable to that of F5. Like F5, M21 and M23 declined to record anything except vocabulary, phrases and sentences. This is in fact an indication that they received some exposure to the oral traditions, and still take them seriously enough to consider that they are not to be treated casually. The speakers who accept most readily to tell stories are not necessarily those who are most familiar with them. On the contrary: some speakers who have a strong footing in another language and culture (in the case of Naish: Chinese) can tell simplified versions of traditional stories all the more easily as they mean less to them.

In 2011-2012, my home institution, *Centre National de la Recherche Scientifique*, allowed me the wonderful opportunity of staying in China for long-term fieldwork. As my main consultant (F4) had by that time moved to the town of Lijiang to take care of a granddaughter, that is where I was also based during 14 months, combining documentation and research; I worked with F4 for an average two hours a day. In 2013, a 45-day stay in Lijiang was conducted, again organizing the work along the same lines.

(On that trip I was accompanied by a student from the University of Ottawa, Meng Yang, who wanted to develop a familiarity with linguistic fieldwork in East/Southeast Asia.)

3.2. Elicitation procedures

3.2.1. *Examination of transcribed texts and direct elicitation*

Following classical methods in linguistic fieldwork, observations from continuous speech (in the case of the present study: mostly narratives) are verified and further investigated through elicitation. A fair amount of transcribed narratives has been collected: more than four hours; but a considerably greater amount would be necessary to be able to study the language's tonal grammar on the basis of these texts alone. Not all possible tonal combinations in compound nouns are found in these texts; and no amount of continuous speech would be enough to obtain all the combinations of numerals from 1 to 100 with the various tonal categories of classifiers, as required for the study of numeral-plus-classifier phrases (Chapter xyz). Systematic elicitation was therefore used to investigate one area after another of the tonal grammar of Yongning Na.

Larry Hyman, reflecting on his study of the tones of another Tibeto-Burman language (Thlangtlang Lai), makes the following observation:

“Clearly the speaker had never heard or conceptualized noun phrases such as “pig’s friend’s grave’s price”, “chief’s beetle’s kidney basket” (...). It would not impress any psychologist, and it would definitely horrify an anthropologist (...) However, when I need to get $3 \times 3 \times 3 \times 3 = 81$ tonal combinations to test my rules, the available data may be limited, or the language may make it difficult to find certain tone combinations. I am personally thankful that speakers of Kuki-Chin languages are willing to entertain such imaginary notions. It is most significant that the novel utterances are produced with the appropriate application of tone rules.” (Hyman 2007:34)

Using this method, L. Hyman completed elicitation of data on Thlangtlang Lai tone within six hours (Hyman 2007:9). Such swift progress is possible when the linguist is fortunate to work with consultants possessing high metalinguistic abilities, who enter into the linguistic reasoning, and collaborate with the linguist as colleagues. Famous cases include François Mandeville, a speaker of Chipewyan who “possessed the extraordinary ability to dictate texts and to explain forms with lucidity and patience” (Li Fang-kuei 1964:132).

In the case of Yongning Na, the relationship with the consultants was somewhat different. In the course of our collaboration, they developed an understanding of a linguist's interests and aims; in particular, tens of hours of work together made consultant F4 familiar with the investigator's body language, so she would understand a repetition-beseeching glance upward from the laptop screen, or volunteer an explanation when a long pause suggested that the investigator was experiencing a doubt. On the other hand, the consultants did not develop metalinguistic intuitions beyond the notion of full homophony between two words. They did not develop any particular interest in linguistic forms, and would only provide linguistic forms corresponding to a precise context. This meant that the elicitation of each desired combination required a great deal of care. To take the example of compound nouns, compounds that were not sufficiently contextualised were produced either as possessive constructions – an English equivalent would be 'skin of the horse', as opposed to the desired 'horse('s) skin' – or as an ungrammatical expression consisting in the mere juxtaposition of the citation forms of the two words. To elicit the compound 'woman('s) blood', for instance, the consultant and the investigator took the time to look for a possible context: imagining that a man-eating demon feels an urge to drink *woman's blood*. Each combination was then double-checked – or rather 'multiple-checked' – by using different example words for the same tonal combination, and eliciting tokens several times during different elicitation sessions. As a result, the elicitation of data from four speakers about this particular point of the tonal grammar extended over the first three field trips, from 2006 to 2008.

3.2.2. The issue of cross-speaker differences

One of the findings from the systematic study of compound nouns (reported in Chapter xyz) was the high degree of cross-speaker differences.

It is a general observation that tone is highly susceptible to dialectal variation; and in view of existing reports, it seems clear that the greater Yongning area is the part of the Naish-speaking area that has the most complex tone systems, and the greatest dialectal diversity. In this light, differences observed within the same village, and even within the same family, did not come as a huge surprise.

Another factor of diversity is the gap between age groups created by ongoing language shift to Chinese. F4's four children are more proficient in Chinese than in Na. All four left Yongning to work; two married Han Chi-

nese spouses without any command of Na; one married a Na spouse from a different dialect area and difficulties of mutual comprehension led the wedded pair to communicate in Chinese instead; one married a Na spouse (F5) but works in faraway Shenzhen and seldom returns home. The generation of her four grandsons and granddaughters has even less command of Na, even though it was F4 who took charge of them in their early years. But there are also notable differences in tonal terms between the speech of F4 (my main language consultant) and F5 (her daughter-in-law), despite their living under the same roof. Documenting the tone system of several speakers is therefore not simply a matter of verifying data: the description is to be conducted separately for each speaker, only comparing the results as a second step. Another difficulty was that transcribed texts are necessary in order to confirm at least part of the patterns obtained through systematic elicitation, but speakers F5, M21 and M23 declined to record narratives, and even if they agreed, arriving at a sizeable collection of texts for each of the four speakers would represent a formidable amount of work – not to mention the difficulty, for the investigator, of keeping the four systems distinct: avoiding unwarranted carry-over of transcription habits developed when working on data from one speaker.

3.2.3. A dilemma: breadth of coverage of the tone system vs. breadth of sociolinguistic coverage

Clearly, it did not appear feasible to explore all areas of the tone system with the same degree of detail for four speakers. This led to the following dilemma: either limiting the extent of investigation – for instance, focusing on compound nouns, or numeral-plus-classifier phrases –, but eliciting data from a broad sample of speakers, to arrive at adequate sociolinguistic coverage; or extending the investigation to more parts of the linguistic system, working towards a complete picture of the tonal grammar of a speaker chosen as main consultant, with occasional extension of the investigation to other speakers.

The second option was preferred: attempting as complete a description as possible of the entire linguistic system. Work with consultant F4 appeared more promising because of her much stronger proficiency in Na than the two younger consultants (F5 and M23), and of her relatively homogeneous linguistic lifecourse, as opposed to M21's long years of practice of various dialects of Na and of Chinese. Basing the work primarily on

data carefully verified with F4 appeared as a reliable starting-point for later comparative work, including cross-speaker and cross-dialect studies.

The ultimate research goal – viewed as a collective endeavour – consists in documenting in great detail the synchronic tone system of a number of research spots in the Na-speaking area, and, on this solid empirical basis, conducting comparisons and gradually reconstructing the history of the evolution of tone systems. Ideally, this will lead to a complete account of the origin and development of tone systems in Naish, shedding light on all the stages that led from a non-tonal stage to each of the present-day varieties. This is clearly a long-term endeavour; the first task to be addressed is to attempt a description of the tonal system of one dialect in its full synchronic complexity.

The analyses of Yongning Na tone reported in the present volume are therefore based on data from consultant F4, unless otherwise mentioned.

3.3. Online materials

A guiding principle in the present research is that a close association between documentation and research is highly profitable to both. Abundant recordings were conducted, and made freely available online, document after document, as their annotation was completed. The recordings are mostly narratives and lexical or phonological elicitation sessions. They are accompanied by metadata (information about the recordings), and, to the greatest extent possible, by full transcriptions, and translations.

The data are hosted by the Pangloss Collection (http://lacito.vjf.cnrs.fr/pangloss/index_en.htm), a language archive developed at the research centre *Oral Tradition: Languages and Civilizations* (LACITO) of the French National Centre for Scientific Research (CNRS) since 1994. The goal of this archive is to preserve and disseminate recorded and transcribed oral literature and other linguistic materials in (mainly) endangered or poorly documented languages, giving simultaneous access to sound recordings and text annotation.

The necessity to document the world's languages is now well-known to linguists and the general public. Fewer people are aware of the dismal current state of multimedia linguistic documentation. Looking back at a century of speech recording, the legacy is not as extensive – and nowhere near as tidy – as the layman would think. If it is true, as Whalen (2004) puts it, that “the study of endangered languages has the potential to revolutionize linguistics”, and that “the vanguard of the revolution will be those who study

endangered languages”, then it is all the more unfortunate that “enormous amounts of data – often the only information we have on disappearing languages – remain inaccessible both to the language community itself, and to ongoing linguistic research” (Thieberger & Nordlinger 2006; see also Woodbury 2003; Woodbury 2011). The Pangloss Collection (etymologically “all languages”) intends to address this major need of the linguistic community by sharing annotated spoken texts of lesser-studied languages, while contributing to the collective effort of preserving the memory of endangered languages. (For a detailed introduction to the Pangloss Collection: Michailovsky et al. 2014.)

For some of the Yongning Na recordings, an electroglottographic signal was collected simultaneously with the audio from the head-mounted microphone. The electroglottographic signal allows for a high-precision measurement of the voice’s fundamental frequency (as well as of other glottal parameters; about electroglottography, see the initial report of the invention: Fabre 1957; a synthesis: Baken 1992; some caveats: Orlikoff 1998; discussions about parameters that can be measured: Henrich et al. 2004, Michaud 2004; and applications to the study of specific linguistic issues, e.g. Mazaudon and Michaud 2008, Brunelle et al. 2010).

The data can currently be accessed at the following address: http://lacito.vjf.cnrs.fr/pangloss/languages/Na_en.htm The documents are perennially archived and will continue to be accessible despite future changes that may take place in the Uniform Resource Locator of the Pangloss Collection’s web interface.

The availability of these audio and electroglottographic data with synchronized transcriptions makes it possible for interested persons to get a feel for the data; it also opens perspectives for further research into a broad range of phonetic topics. Given the amount of time that is necessary to produce a state-of-the-art experimental phonetic investigation, it is simply impossible for linguists who are working at the description of an entire language (or of several languages) to launch into a phonetic study to substantiate and refine each of their observations; on the other hand, it appears feasible to collect a sufficient amount of data for interested colleagues to conduct such a study. To take the example of recorded data about numeral-plus-classifier phrases (analyzed in Chapter xyzO2), here are two examples of phonetic phenomena that can be studied in future on the basis of the recorded data Yongning Na data:

(i) The implementation of tone. The electroglottographic signal has not been exploited so far, except for its occasional use in auditory verification

(the pitch can be clearer when listening to the electroglottographic signal than when listening to the audio). This signal could serve in future for a phonetic study of the implementation of tone in Yongning Na. There is a large gap between phonological representations in terms of sequences of level tones, on the one hand, and observed fundamental frequency curves, on the other: “both F_0 height and F_0 velocity are relevant parameters (...) even for the simplest level tone languages” (Yu 2010:1). A study of the implementation of tone sequences in Na would be a useful addition to the existing literature on contextual tonal variation and segmental effects on tone, as studied e.g. by Abramson 1979, Gsell 1985 and Gandour and Potisuk 1992 for Thai, and Xu Yi 1997, 1998 for Mandarin.

(ii) The weakened (hypo-articulated) realization of repeated words. When a consultant pronounces a sequence of numeral-plus-classifier phrases, such as /ɕwɪt-kʰwɪɽ | ɲɪt-kʰwɪɽ | soɽ-kʰwɪɽ | zɣɪt-kʰwɪɽ/ (‘one piece, two pieces, three pieces, four pieces...’), the tone of the classifier changes (High, High, Low-to-High, Mid...) but its consonants and vowels do not. As a result, the speaker’s attention focuses on the realization of the new information (essentially: the correct tone sequence for the phrase); in terms of the continuum from hyper-articulation to hypo-articulation (Lindblom 1990), the classifier is hypo-articulated. Specifically, the unvoiced lateral /ɬ/ in classifiers such as /ɬɪ/ ‘month’ and /ɬɪ/ ‘armspan’ is occasionally realized as voiced, despite the existence of a voicing opposition between /ɬ/ and /l/ in Na. Pursuing such observations would shed light on the field of allophonic dispersion of Na phonemes. Due to the nature of the corpus, numerous tokens of each numeral and classifier are available, offering a good basis for statistical treatments.

H1 category of classifiers				
classifier for...	recordings WITH electroglottographic component		recordings WITHOUT electroglottographic component	
	30 to 100	1 to 100	1 to 10	1 to 30
chunks	AUDIO + EGG	AUDIO + EGG (1st recording); AUDIO + EGG (2nd recording)		AUDIO
trees			AUDIO	

H2 category of classifiers			
classifier for...	recordings WITH electroglottographic component		recordings WITHOUT electroglottographic component
	30 to 100	1 to 100	1 to 30
days	AUDIO + EGG	AUDIO + EGG	AUDIO

M1 category of classifiers		
classifier for...	recordings WITH electroglottographic component	recordings WITHOUT electroglottographic component

Figure 1. Screen shot showing a fragment of the static HTML page presenting the list of resources in Yongning Na in the Pangloss Collection

W9	<input type="checkbox"/> <input type="checkbox"/>	gʷl-ɤwɤʎ/	9 堆 (粮 食.....)	9 heaps (e.g. of grains, of cut wood)	9 tas (de céréales, de bois coupé...)
W10	<input type="checkbox"/> <input type="checkbox"/>	ts ^h eɫ-ɤwɤʎɫ	10 堆 (粮 食.....)	10 heaps (e.g. of grains, of cut wood)	10 tas (de céréales, de bois coupé...)
W11	<input type="checkbox"/> <input type="checkbox"/>	ts ^h eɫqɯɫ-ɤwɤʎɫ	11 堆 (粮 食.....)	11 heaps (e.g. of grains, of cut wood)	11 tas (de céréales, de bois coupé...)
W12	<input type="checkbox"/> <input type="checkbox"/>	ts ^h eɫɲɪɫ-ɤwɤʎɫ	12 堆 (粮 食.....)	12 heaps (e.g. of grains, of cut wood)	12 tas (de céréales, de bois coupé...)
W13	<input type="checkbox"/> <input type="checkbox"/>	ts ^h eɫsoɫ-ɤwɤʎɫ	13 堆 (粮 食.....)	13 heaps (e.g. of grains, of cut wood)	13 tas (de céréales, de bois coupé...)
W14	<input type="checkbox"/> <input type="checkbox"/>	ts ^h eɫzɯɫ-ɤwɤʎɫ	14 堆 (粮 食.....)	14 heaps (e.g. of grains, of cut wood)	14 tas (de céréales, de bois coupé...)
W15	<input type="checkbox"/> <input type="checkbox"/>	ts ^h eɫɲwɤʎɫ-ɤwɤʎɫ	15 堆 (粮 食.....)	15 heaps (e.g. of grains, of cut wood)	15 tas (de céréales, de bois coupé...)

Figure 2. A passage from one of the documents as displayed on the web interface.

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Chapter 2

Vowels and consonants

1. Introduction: no phonological alternations; rich coarticulatory phenomena

The vowels and consonants of Yongning Na are relatively static from a phonological point of view: they are not involved in synchronic phonological rules and processes. In this respect, Yongning Na is at the opposite end of the typological continuum from a language such as Kifuliiru (Bantu), which has (i) a range of phonological rules, such as the strengthening of /h/, /l/ and /r/ to a plosive when preceded by a nasal, and the total assimilation of a non-high, non-back vowel (/e/ or /a/) to a following vowel at morpheme boundaries within the word, e.g. /a/+u/→/uu/, and (ii) morphological rules, such as the deletion of final consonants in resultative verb forms (Van Otterloo 2011, 37–96).

When studying Yongning Na, attention is directed instead to phonetic properties of vowels and consonants within tightly coarticulated syllables. Syllabic structure in Yongning Na is simply (C)(G)V, where C is a consonant, G a glide – with a severely restricted distribution – and V a syllable nucleus; the brackets indicate that C and G are optional. Coarticulation constitutes a salient part of a language's sound system. Structural approaches to phonological systems predict cross-linguistic differences in phenomena of coarticulation and articulatory reduction. To take an example, the extent to which the palatalizing influence of high, front vowels makes itself felt depends in part on the number, nature and functional yield of existing phonemic oppositions: in Na, which contrasts /ki/ and /tɕi/, the range of allophonic variation of /ki/ can safely be predicted to be narrower than in Naxi, which does not have this contrast.

Phonetic studies confirm the language-specific nature of coarticulation. A recent article (DiCanio 2012, 162) recapitulates the following conclusions: “Language-specific factors which influence coarticulatory timing include lexical contrast (Scarborough 2004), phonological inventory size (Manuel 1999), and the phonological distribution of contrasts (Bird et al. 2008; Howe and Pulleyblank 2001; Manuel 1999; Miller 2007).” In the description that follows, special attention will be paid to coarticulation, allophonic variation, and phenomena of articulatory reduction.

2 Vowels and consonants

Given the (C)(G)V structure of Yongning Na syllables, it appears simplest to present the inventory in terms of initials, corresponding to consonants, and rhymes, corresponding to (G)V: see Table 1 and Table 2.

Table 1. The initials of Yongning Na. Approx. =approximant.

	bilabial	dental	alveolo-palatal	retroflex	velar	uvular	glottal
plosive	p ^h p b	t ^h t d		t̪ ^h t̪ d̪	k ^h k g	q ^h q	
affricate		ts ^h ts dz	tɕ ^h tɕ dʒ	tʂ ^h tʂ dʐ			
nasal	m	n		ɳ	ŋ		
fricative		s z	ɕ ʑ	ʂ ʐ		ʁ	h
lateral		ɬ l					
approx.				ɻ			

Table 2. The rhymes of Yongning Na.

i			u
e	ɤ		o, jo
			ɤ, wɤ, jɤ
	ə		
		ɻ	
æ, wæ, jæ			ɑ

To these must be added the nasal vowels /ĩ/, /ỹ/, /w̃ɤ/, /ã/ and /ã̃/ appearing only after /h/; the syllables /ĩ/ and /w̃æ/; and the nasal vowel /õ/ appearing after /h/ or on its own (/hõ/, /õ/).

The notation used throughout this book, and in the transcription of texts, is phonemic in orientation. In a few borderline cases, discussed in detail below, such as those of the syllables [ni], [ɻ] and [fɤ], pushing phonemization to its extreme could obscure ongoing evolutions; in those cases, the choice made consists in keeping the transcriptions close to the surface forms.

2. The syllable nuclei: vowels and syllabic consonants

2.1. Consonantal nuclei

Some consonantal sounds function as syllable nuclei. In the International Phonetic Alphabet such a sound is called ‘syllabic’, because it functions as the nucleus of a syllable. Fricative syllabics are an areal characteristic: in particular, they are common in neighbouring Yi languages, which belong to the Nasoid subgroup of Loloish (a.k.a. Ngwi; see Bradley 1979, 70). Local dialects of Chinese also have a fricative syllable nucleus, /fʏ/: ‘lake’, Standard Mandarin *hú* 湖, is pronounced [fʏ]. Since Na does not have coda consonants, ‘consonantal nuclei’ will also be referred to as ‘consonantal rhymes’. Yongning Na has the following consonantal rhymes: [ʏ], [ʐ], [ʑ], [ɬ] and [ʃ].

2.1.1. The voiced fricative /ʏ/

The voiced fricative /ʏ/ can only appear as a rhyme, not as an initial. On the whole, the friction for /ʏ/ is weaker than in Naxi. There is some amount of formant movement towards a central articulation: [v³]. Since friction noise is small even at the beginning of the rhyme, this /ʏ/ could be described as close to an approximant, [v]. Martinet makes a distinction between fricatives proper, which have a firm articulation and are characterised by fricative noise, and spirants, which have a relaxed articulation, tending towards a vowel-like aperture (Martinet 1956, 24; Martinet 1981). In terms of this distinction, unfortunately not taken up in the International Phonetic Alphabet, the articulation of /ʏ/ in Yongning Na is spirant rather than fricative. After bilabial initials, /ʏ/ has a tendency towards trilling (though, again, less markedly so than in Naxi): /bʏ/ is realised close to [ʙ], /pʏ/ close to [pʙ], and /p^hʏ/ close to [p^hʙ].

In the absence of strong friction, the rhyme /ʏ/ can be difficult to distinguish from the high back vowel /o/, especially after consonants that exert similar coarticulatory effects on the rhyme. Uvular stops result in a retracted (backed) articulation of both /ʏ/ and /o/, making the opposition between syllables such as /qʏ/ and /qo/ difficult to hear at first. Minimal pairs are found, such as /mæɬqʏ/ ‘tail’ vs. /mæɬqo/ ‘end; back’.

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2.1.2. *Apicalized vowels*

The vowel /u/ has fricative allophones after dental and retroflex fricatives and affricates. This situation is identical to that found in Naxi. For instance, /ts^huɿ/ ‘goat’ is realised [ts^hʒɿ], and /dʒuɿ/ ‘market, city’ is realised [dʒʒɿ]. It is customary to transcribe these sounds phonetically by means of the symbols coined by Chao Yuen-ren: [ɿ] and [ʌ], respectively. (The whole set proposed by Chao Yuen-ren consists of the plain apical vowel [ɿ], the retroflex apical vowel [ʌ], the rounded plain apical vowel [ʊ], and the rounded retroflex apical vowel [ʊ̣]: see Pullum and Ladusaw 1986.)

Additionally, there exists in Yongning Na an opposition between /i/ and /u/ after the alveolopalatal initials /dʒ/, /tɕ/ and /tɕ^h/. Syllables /dʒi/, /tɕi/ and /tɕ^hi/ have moderate friction during the initial, and the rhyme is not strongly apicalized. The syllables analyzed as /dʒu/, /tɕu/ and /tɕ^hu/, on the other hand, have apicalized rhymes: they are realized close to [dʒʒ], [tɕʒ] and [tɕ^hʒ], respectively.

Phonetically, the syllables /dʒu/, /tɕu/ and /tɕ^hu/ are not easy to distinguish from /dʒu/, /tsu/ and /ts^hu/, which are realized as [dʒɿ], [tsɿ] and [ts^hɿ] (standard International Phonetic Alphabet notation: [dʒ], [tsɿ] and [ts^hɿ]). An added complexity is related to Voice Onset Time oppositions among alveolopalatal initials. Syllables with an unvoiced or aspirated initial, /tɕ/ or /tɕ^h/, have stronger affrication than those with initial /dʒ/; this has coarticulatory consequences on the following vowel, so that both /i/ and /u/ are somewhat less open after /tɕ/ and /tɕ^h/ than after /dʒ/.

A recording was specifically conducted for words containing one of the following syllables: /dʒi/, /dʒu/, /tɕi/, /tɕu/, /tɕ^hi/ and /tɕ^hu/. The corresponding sound file is: F4_Palatalized_Apicalized.¹

2.1.3. *Rhotic rhymes*

Further consonantal rhymes are /ɹ/ and its nasalized counterpart /ɹ̃/. From a phonetic point of view, the rhyme /ɹ/ does not display the considerable lowering of the third formant which is the telltale characteristic of rhotic vowels (Ladefoged and Maddieson 1996, 313), such as Naxi [ɻ]. The dia-

¹ I overlooked this opposition until it was brought to my attention by Roselle Dobbs, who confirmed its presence in several locations in and around the plain of Yongning by means of a perception test (p.c.).

critic indicating syllabic status distinguishes this rhyme from the consonant phoneme /ɿ/ described in §3.3. As a rhyme, /ɿ/ can appear on its own or preceded by a retroflex fricative or affricate. Examples of syllables containing a /ɿ/ rhyme preceded by a retroflex affricate are presented in Table 3, together with syllables made up of the same consonant followed by the rhyme /ʏ/.

Table 3. Some examples illustrating the phonemic contrast between /ɿ/ and /ʏ/ after retroflex fricatives and affricates.

	ʏ	ɿ
tʂ ^h	/tʂ ^h ʏ-/ ‘breakfast’, /tʂ ^h ʏ-ɿŋ/ ‘ant’, /bʏ-tʂ ^h ʏ-/ ‘cymbals’	/tʂ ^h ɿŋ/ ‘lungs’
tʂ	/mʏ-tʂʏŋ/ ‘wrinkles’	/tʂɿŋ/ ‘to cough’
dʒ: no contrasts observed		
dental and retroflex stops (t ^h t̪ d t ^h t̪ d): no contrasts observed		
ʂ	/ʂʏ-dʏ-/ ‘to think’	/ʂɿŋ/ ‘full’
ʐ: no contrasts observed		

Under the present analysis, the rhyme /ɿ/ has a nasal counterpart, /ĩ/. Only two items have been found so far: the highly frequent word ‘bone’, /ĩŋ/, which also has the meaning of ‘stem’; and ‘helpless, impoverished, troubled’, /ĩŋ/. Notation as a nasal rhotic vowel, /ẽ/ or /œ̃/, could also be acceptable; the symbol /ĩ/ was chosen because the rhymes transcribed as /ɿ/ and /ĩ/ have phonetic similarities and plausibly stand in a relation of structural opposition, the one oral, the other nasal.

The word for ‘bone’, here transcribed as /ĩŋ/, is transcribed phonetically as [ʔm̩ɿ] and analyzed phonemically as /ŋʏɿ/ by Fu Maoji (1983, 25). Concerning the phonetic transcription, the sequence of two symbols is not to be understood as a succession of two sounds: here as in his other publications, Fu Maoji uses the symbol /ɿ/ to indicate a rhotic quality of the preceding vowel symbol. Concerning the phonemic analysis, /ŋʏɿ/ is an attractive solution: nasality would be due to a nasal onset, and rhoticity to a rhotic, fricative rhyme, /ʏɿ/. However, in the attested syllable /ŋʏ/, coarticulation between the initial and rhyme does not go so far as to result in complete coalescence: the syllable retains two parts, first [ŋ], with complete oral closure, then [ʏ], which is nasalized but without oral closure. A syllable that is identical with /ŋʏ/ except for a feature of rhoticity would be expected to begin similarly by a nasal consonant (with complete oral

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closure). For this reason, this syllable is not analyzed here as a rhotic counterpart to /ŋʏ/ (with nasal onset and oral rhyme), but as a monophonemic syllable consisting simply of a nasal rhyme. As for its analysis as /ĩ/ or /ỹ/, both options are open, since there is no opposition between those on onset-less syllables. On the basis of phonetic considerations, I believe that notation as /ĩ/ is much more adequate synchronically.

2.1.4. Potential for the creation of new syllabic consonants and monophonemic syllables

In syllables of simple CV (consonant+vowel) segmental structure, the consonant and vowel paired together become strongly coarticulated; their features tend to be realized over the syllable as a whole. Numerous examples are found in the Yi (Lolo) branch of Sino-Tibetan languages: while the impetus for monosyllabification can safely be hypothesized to have come from Old Chinese, which influenced – directly or indirectly – languages of the Sino-Tibetan, Tai-Kadai, Hmông-Miê and Austroasiatic families, segmental depletion has reached a more extreme point in Yi than within Chinese itself (as pointed out by Haudricourt 1991). In Naish as in Loloish, coarticulation in CV monosyllables tends to create compact units that become less and less tractable to a straightforward analysis into two distinct phonemes, until the syllable becomes monophonemic.

In addition to apicalized vowels, discussed above (§2.1.2), syllabic nasals can also be interpreted in this light. “In various Loloish languages some or all of the nasals occur as syllabics. In most such cases the diachronic source is syllables with a nasal initial and a high vowel; sometimes one dialect has nasal syllabics where others have nasals plus a high vowel. This could be called rhyme-gobbling” (Bradley 1989, 150; see also Björverud 1998, 8). Yongning Na reveals an intermediate stage: the syllable /mʏ/ is phonetically realized as [m̥] except in careful (hyperarticulated) speech – whereas /nʏ/ and /ŋʏ/ are pronounced as [nʏ] and [ŋʏ] respectively, retaining an oral portion after the initial nasal. Other syllables that tend towards articulation as one single sound include /k^hu/, which is often devoiced when it carries a L tone: [k^hu̥]. The entire syllable is realized as a [k^h] that adopts the lip and tongue configuration of the vowel /u/. In the present state of the language, these are simply phonetic variants; they are mentioned to illustrate the potential for the further evolution of highly eroded syllables in Yongning Na.

2.2. Close vowels

The close vowels /i/ and /e/ contrast after dental fricatives and affricates, e.g. /dzi/ ‘to sit’ vs. /dze/ ‘to fly’, /tsi/ ‘to boil’ vs. /tse/ ‘to lock’, /ts^hi/ ‘classifier for animal skins’ vs. /ts^he/ ‘salt’, and /si/ ‘wood’ vs. /se/ ‘to walk’. The syllable /zi/ was only found in /ts^hi-tzi#/ ‘highland barley’ and /lɑ-tzi/ ‘painter’, as against about forty instances of /zu/.

In this context, both vowels are apicalized, which makes their phonetic difference a very fine one. Apicalization is stronger for /u/ than for /i/; another difference is that the lips are stretched for /si/, /dzi/, /tsi/ and /ts^hi/. In the first transcriptions, the contrast between the two apicalized vowels /i/ and /u/ was overlooked, and the syllables above were mistakenly transcribed as /*su/ (for ‘wood’), /*zu/ (for ‘barley’), /*dzu/ (for ‘to sit’), /*tsu/ (for ‘to boil’) and /*ts^hu/ (for the classifier for animal skins). In the many contexts where the opposition between /i/ and /e/ is neutralized, the transcription follows their phonetic realization, which is closer to [e] after retroflex fricatives and affricates, and to [i] in all other contexts (after bilabials, velars, retroflex stops and fricatives, laterals, nasals, alveolopalatals, and the glottal /h/).

After the dental nasal /n/ and the dental lateral /l/, the close vowels /i/ and /e/ are marginally contrastive. The syllable /ne/ is only found in a grammatical morpheme, /-ne/ ‘as, like’, which appears in the interrogative /q^hɑ-ne/ ‘how’, the manner demonstratives /tṣ^hu-ne-t-jɪ/ (proximal) and /t^hɣ-ne-t-jɪ/ (distal), and constructions such as /tɕ^hɣ-tɲi-t-ne-t-jɪ/ ‘every day; repeatedly, all the time’. The recognition of the morpheme /ne/ was delayed by the fact that the highly frequent expression /tṣ^hu-ne-t-jɪ/ ‘thus, in this way’ is pronounced very close to [tṣ^hu-ne-tɪ], and hence was initially transcribed as /*tṣ^hu-ne-tɪ/. It gradually appeared that there was an issue with this transcription, however, as the manner demonstrative cannot project a H tone onto a following syllable, as would be expected if it carried tone MH#. For instance, it came as a puzzle that the passage initially transcribed as /tṣ^hu-ne-tɪ | gwɣ-tɲi-mæ/ ‘This is how [people] sing’ (Caravans.53) did not allow a variant /*tṣ^hu-ne-tɪ gwɣ-tɲi-mæ/, with integration in a single tone group and reassociation of the H part of the MH contour to the verb /gwɣ/ ‘to sing’. This state of affairs becomes self-evident once it is understood that ‘thus, in this way’ remains trisyllabic, /tṣ^hu-ne-t-jɪ/, despite the strong phonetic coarticulation between its last two syllables. (This is a

highly frequent morpheme, occurring over 500 times in 25 texts; this goes some way towards explaining its phonetic erosion.)

Another marginal case where it appears reasonable to posit a /e/ vowel distinct from /i/ is in combination with initial /l/. The syllable /li/ is common, appearing in about thirty words. A [le] syllable appears in the ACCOMPLISHED, /le-/, and in derived items, such as [njɣ-le-ɣv#l] 'daytime', which is perceived by consultant F4 as 'the day is flowing/going by': 'day', /ɲi/, followed by the ACCOMPLISHED, /le-/, and the verb 'to flow, to go by, to fly (time); to take place, to occur (event)', /gɣ/. (The change of the first syllable from /ɲi/ to /njɣ/, which testifies to the advanced stage of lexicalization of this phrase, cannot be accounted for at present.) Should its etymology cease to be clear to speakers, the word [njɣ-le-ɣv#l] 'daytime' would introduce /le/ as an attested syllable in nouns.

To sum up, the opposition between /e/ and /i/ is restricted to dental sounds, and within this order, it is mostly restricted to fricatives and affricates. This is one of the many cases where a phonemic opposition is found in highly restricted contexts; in Praguian terms, these constitute extreme cases of neutralization. This issue will be taken up in the discussion of the inventory of syllables, in section 4.

As for close back vowels, [o] and [u] are contrastive in a single context: after the glottal initial, /h/, i.e. in the syllables /hu/ and /ho/. Phonetically, there is stronger friction in the initial for the latter: this could be approximated phonetically as [hu] vs. [χo]. Examples of /ho/ include /ta-ho-/ 'together', /ho#l/ 'porridge, gruel', /qoJho-ɪ/ 'wicker box', /ho-ɪ/ 'to sip', /hoJ_a/ 'correct', /ho#l/ 'partridge', and /-hoJ/ 'future/desiderative'. Examples of /hu/ are fewer; they include /hu-ɪmiɫ\$/ 'stomach', /huɪ/ 'to wait', and /hu-ɪ/ 'to miss, to long for'.

In all other contexts, there is no opposition between close and close-mid rounded back vowels, [o] and [u]. Phonetic realizations are very close to [o] after dentals and uvulars; auditory impression suggests that realizations are often close to [u] after the other consonants: bilabials, alveolopalatals, and retroflexes. Unlike the front close vowel, which is more open after retroflex fricatives and affricates (making it sound more like [e]), the back close vowel is less open in this context.

In the speech of consultant F4, the sounds that I hear as [o] and [u] could be treated as allophones (except after /h/); the archiphoneme could be transcribed as /O/ or /U/. For the sake of visual simplicity, and in view of the contrastive status of /o/ and /u/ after /h/, these two vowel sounds are distinguished in the notations, following the auditory impression reported

above: that phonetic realizations are very close to [o] after dentals and uvulars, and often closer to [u] after the other consonants: bilabials, alveolopalatals, retroflexes, and the labial-velar approximant /w/. Finally, the rhyme made up of this vowel preceded by a palatal approximant is transcribed as /ju/.

The two sounds [o] and [u] may have stronger phonemic status in the speech of younger speakers, whose increasing proficiency in Standard Mandarin makes them familiar with a phonemic /u/ (contrasting with /o^w/ and /^wo/; the Pinyin transcription of these three vowels is: *u, ou, uo*). Southwestern Mandarin does not exert direct pressure in this direction, since /u/ is fricativized in this dialect of Mandarin. For instance, the word /ts^hu/ ‘vinegar’ is pronounced [ts^hɿ]. This word, which is in common use in Yongning, is accordingly pronounced as [ts^hɿɿ] in the speech of the older speaker F4.

Finally, the vowel transcribed as /u/ is articulated less to the back than the Naxi vowel transcribed with the same symbol. From a phonetic perspective, one could argue in favour of using the symbol /i/.

2.3. A neutral vowel: /ə/

The symbol /ə/ is used only to transcribe the vowel of some grammatical words, which undergoes harmony with the vowel of the following syllable, and the first syllable of some lexical words, where it can plausibly be analyzed as a prefix. It is present in kinship terms, such as /əɬmiɬ/ ‘mother’, realized as [eɬmiɬ]; /əɬmaɬ/ ‘mother (VOCATIVE)’, [aɬmaɬ]; and /əɬɣɬ/ ‘uncle’, [ɣɬɣɬ]. The NEGATION, /mə/, likewise undergoes harmony with the vowel of the syllable that follows. Realizations are close to [æ] before /æ/ and apicalized allophones of /u/; to [ɛ] before /i/, /i/ and /e/; to [ɑ] before /ɑ/ and /wɣ/; and to [ɤ] before /ɤ/, /o/, /u/, /jɣ/, /jo/ and /ɿ/. Before /ɿ/, the neutral vowel /ə/ harmonizes differently depending on whether there is an intervening consonant or not: it is realized close to [ɣ] when immediately followed by /ɿ/, as in /əɬɣɬ/ ‘uncle’ (phonetic approximation: [ɣɬɣɬ]); and it is close to [æ] when the /ɿ/ is preceded by a consonant, as in /əɬp^hɿɬ/ ‘mother’s uncle; male ancestor of the second generation’ and /əɬmɿɬ/ ‘older sibling’ (phonetic approximation: [æɬp^hɿɬ] and [æɬmɿɬ]). (This analysis was suggested by Roselle Dobbs.)

Note, however, that phonetic (incomplete) vowel harmony is not restricted to the vowel transcribed as /ə/. This topic is taken up in §2.8.

No phonetic difference could be identified with the [a] realization of /ə/ before /a/, on the one hand, and the realization of the /a/ vowel phoneme; for instance, the clan name [a-lɑ-] is phonemicized as /ə-lɑ-/, but an interpretation as /a-lɑ-/ cannot be ruled out. Some more details about the realization [æ] are provided in the following section, since this issue intersects with the phonemic analysis of the vowel /æ/.

2.4. Nasal rhymes

2.4.1. Nasal rhymes after the glottal /h/

Yongning Na has a relatively large inventory of nasal rhymes: it comprises /ĩ/, /ỹ/, /õ/, /w̃ɣ/, /ẽ/ and /ã/, and the syllables /ĩ/ and /wẽ/. The first six are found after /h/, where they contrast neatly with their non-nasal counterparts, as illustrated in Table 4.

Table 4. Examples of /h/-initial syllables that are part of a correlation of nasality: /hi/-/hĩ/, /hy/-/hỹ/, /ho/-/hõ/, /hwɣ/-/hw̃ɣ/, /hæ/-/hẽ/, and /ha/-/hã/.

oral rhyme	nasal rhyme
/hi/ ‘tooth’	/hĩ/ ‘man’; /hĩ-ɪ/ ‘to stand’
/hy-ɪ/ ([fɥ-ɪ]) ‘to like’	/hỹ/ ‘red’; /hỹ/ ‘hair’; /nɥ-ɪhỹ/ ‘kidney bean’; /dʒi-ɪhỹ/ ‘clothes’; /hỹ-ɪ-hỹ/ ‘to stir-fry’
/ho-ɪ/ ‘to sip’; /ho/ ‘to wait’	/hõ-ɪ/ ‘eight’; /hõ-ɪ/ ‘to go (IMPERATIVE)’
/hwɣ/ ‘to pass over, to hand over’	/hw̃ɣ/ ‘late’
/hæ-ɪ/ ‘Chinese’; /hæ-ɪ/ ‘lime’; /hæ-ɪpɣ-ɪ/ ‘plait’	/hẽ-ɪ/ ‘wind’; /hẽ/ ‘gold’
/ha/ ‘food’	/hã-ɪ/ ‘night’

Diachronically, these syllables illustrate a process of transfer of nasality from a syllable-initial consonant cluster to a following vowel. This process is attested in several languages of Asia. In Kam-Sui (Tai-Kadai family), Sandong Sui lost the stop part of the original cluster: the stop+nasal clusters *km-, *kn-, *tn- and *kɲ- merged with the preglottalized *ʔm-, *ʔn- and *ʔɲ- initials. The latter are preserved in Sui, e.g. /ʔma¹/ ‘vegetables’, /ʔma³/ ‘flexible’, both corresponding to a Proto-Kam-Sui *ʔm initial (Ferlus 1996, 251–252). Lakkia preserved the initial stop, while the nasal underwent leni-

tion, nasalizing the following vowel in the process. Northern Sui dialects (Pandong 潘洞 and Yang'an 阳安) illustrate a possibility for the later evolution of glottal+nasal onsets: distinctive nasality is transferred onto the following vowel, and only the glottal remains, yielding [ʔ̃V] or [h̃Ṽ]; the entire syllable is nasal, including the initial glottal sound (Haudricourt 1967, 176). This is exactly parallel to the facts of Yongning Na and other Naish languages, as brought out in Table 5, taken up from a cross-linguistic (pan-chronic) analysis of historical transfers of nasality between consonantal onset and vowel (Michaud, Jacques, and Rankin 2012).

Table 5. Comparative vocabulary for five words in Rgyalrong and in Naxi, Na and Laze, pointing to the diachronic development of distinctive nasality on vowel rhymes in Naxi, Na and Laze from earlier /*rN-/ onsets.

	red	to stand	person	body hair	to stir-fry	two
Japhug Rgyalrong	yurni	rma ("stay at s.o.'s place")	tu-rme	tx-rme	rɲu (loan from Tibetan)	ɣnuus <*qnis
Fengke Naxi	hỹɿ	hỹɿɿ	hĩɿ	hỹɿ	—	ɲiɿ
Yongning Na	hỹɿ	hĩɿɿ	hĩɿ	hỹɿ	hỹɿ~hỹɿ	ɲiɿ
Laze	—	hĩẽɿ	hĩɿ	hỹɿ	—	ɲiɿ

As seen in Table 5, Rgyalrong has some initial clusters; indeed, it is the only language in this part of Sino-Tibetan that preserves a broad range of initial clusters. Rgyalrong provides more relevant evidence than Written Tibetan: taking the third word in Table 5 as an example, Written Tibetan does not have an initial cluster in the word for 'person' (*mi*), whereas Rgyalrong has /rme/.

Table 5 brings out a correspondence between the /h̃Ṽ/ syllables of Naxi, Na and Laze and etyma with initial /rm-/ or /rn-/ in Rgyalrong. (The meaning of Rgyalrong /rma/, 'to stay at someone's place', must be considered to be a development from the meaning 'to stand'.) On the analogy of the cases described above, we conclude that these /h̃Ṽ/ syllables do not simply result from rhinoglottophilia (a term coined by Matisoff 1975 to refer to "an affinity between the feature of nasality and the articulatory involvement of the glottis"), but that they originate in earlier *CNV syllables. This analysis seems almost trivial in view of the wealth of examples from various languages set out above; it nonetheless constitutes a less than trivial contribution to the study of nasal vowels in Sino-Tibetan. The hypothesis that the

nasal vowels found in some Sino-Tibetan languages could be attributed to the influence of syllable-initial nasals was already expressed by Huang Bufan 1991; on the other hand, no hypotheses had been proposed heretofore as to which specific sequences of phonemes were involved in the change.

The last example in Table 5, ‘two’, illustrates the preservation in Naxi, Na and Laze of nasals that originate in onsets other than */*rN-*. It appears reasonable to hypothesize that the **CN-* onsets that led to vowel nasalization all went through a */*sN-* stage; indeed, *sN*-initial cognates are observed in Tibetan for some of these items. (For general phonetic reflections on this topic see Ohala and Ohala 1993, 233: “children learning English sometimes pronounce target *sm* and *sn* clusters as voiceless nasals”.)

In front of nasal rhymes, */h/* is nasalised; the lowered velum prevents the buildup of intra-oral pressure required for a strong friction noise. Since the entire syllable is nasalized, another option for phonemic analysis would be to posit an initial nasal glottal fricative, */ɦ/*; the decision made here to interpret nasality as a characteristic of the vowel rather than the consonant is based on the observation that nasal vowels are also found in a small set of syllables that do not have an initial glottal fricative.

2.4.2. Onset-less nasal syllables: */õ/*, */ǣ/* and */ĩ/*

Among onset-less nasal syllables, */õ/* contrasts with */o/*, */ǣ/* with */æ/*, and */ĩ/* with */ɨ/*. Examples of */o/* (realized with a glide onset, [wo]) include */woɭ/* ‘hard’; examples of */õ/* include */õɭɿ/* ‘(one)self’, */õɭɿswɿɿ/* ‘mosquito’ and */õɭɿɿɿ/* ‘wolf’. Synchronically, initial glottalization contributes to a clear phonetic contrast between */o/*, realized [wo], and */õ/*, realized [ʔõ]. Examples of */ĩ/* and */ɨ/* were presented above (§2.1.3). The syllable */ǣ/* always has a glottalized onset: [ʔǣ]. A non-nasalized syllable [ʔæ] is also found in the system, and is analyzed as */æ/*, i.e. recognizing the phonemic status of both */æ/* and */ǣ/*. Examples of */ǣ/* are relatively numerous: it is found in words such as ‘chicken’, ‘bronze’, ‘plow’ and ‘soul’. Among disyllables, examples include */ǣɿɿzuɿ/* ‘agate’ vs. */æɿgvɿ/* ‘ard’; */ǣɿ-miɿ/* ‘hen’ and */æɿmiɿ-kwɿɿɿ/* ‘the village of A-Mi’ form a quasi-minimal pair.

From an evolutionary point of view, the glottal onset of [ʔõ] and [ʔǣ] may be due to the same phenomenon of hardening of empty onsets which results in the presence of an initial [ɰ] in words such as */kwɿɿɿ/* ‘village’, corresponding to Naxi */wɿɿɿ/* (more about this phenomenon below, §2.5).

Still on a speculative note, it may be that the nasality accompanying the glottal initial is an instance of rhinoglottophilia (Matisoff 1975).

2.4.3. *Phonemic analysis of the onset-less nasal syllable [w̃æ]*

As mentioned above, the syllable realized as [ʔw̃æ] appears in a single word: ‘to swell, to inflate (e.g. the belly is swollen)’, [ʔw̃æɪ]. It does not have a non-nasal counterpart. In the absence of an opposition with an oral syllable [wæ], nasality and initial glottalization might be considered the product of implementation rules, rather than as part of the phoneme’s definition. In this perspective, phonemic analysis could be simply /wæ/. However, the Chinese syllables *wa*, *wan* and *wang* (as in 王 *wáng*, a very common family name) are pronounced as [ɤwæ] by consultant F4, rather than as [w̃æ]. If the underlying, phonemic form of syllables such as ‘to swell’ were simply /wæ/, one would expect these Chinese forms to fall into the /wæ/ category (phonetically [ʔw̃æ]), not into the [ɤwæ] category. The transcription used here is therefore /w̃æ/, granting phonological status to nasality, which plays a role in the vowel system of Yongning Na, but not to initial glottalization, which does not. To sum up the analysis: the syllable /w̃æ/, realized as [ʔw̃æ], contrasts with /wæ/, realized as [ɤwæ] (see §2.5.3).

In the syllable /w̃æ/ as in the syllable /h̃w̃ɤ/, the diacritic for nasality is placed on the glide rather than on the final vowel because the degree of phonetic nasalization decreases in the course of the rhyme.

2.4.4. *The syllable /ĩ/*

The syllable /ĩ/ appears in one single word, the interjection ‘Yes!’, ‘Okay!’, used as a response to an instruction given by a person having authority (either one’s elder, or another person detaining authority): /ĩɪ/ (phonetically: [ʔĩɪ]). This item is described as having a mid tone, but could also be analyzed as a toneless interjection generally realized on a level pitch.

2.4.5. *The nasal rhyme /õ/ appears as a variant on two Tibetan loanwords*

Some Tibetan loanwords preserve a nasal rhyme /õ/ in Na, alternating with oral realizations: /o/. Only two examples have been found so far: /ts^hoɪpæ#ɿ/~ts^hõɪpæ#ɿ/ ‘head of caravan’ (compare Written Tibetan *tshong*

pa ‘merchant’), and /la+ma+ko+tsʰo+/-/la+ma+ko+tsʰõ+/-/ ‘name of deity’ (see the narrative Lake4). On the other hand, the word for ‘monastery’, /go+bx/ (compare Written Tibetan *dgon pa*), does not have a nasalized variant /*gõ+bx/.

2.5. A presentation of on-glides, with a hypothesis about a diachronic onset of hardening of initial glides

2.5.1. Smooth phonetic onsets

The high vowels /i/, /u/ and /o/ have a phonetic on-glide: they are realized as [ji], [yu] and [wo]. The phonetic realization of the syllable /u/ could also be transcribed with an approximant initial: [ɥu]; this is the choice made in a dictionary of Naxi (Pinson 2012), a language where the phonemic analysis is the same and the phonetic realization does not sound any different to me.

The phonetic on-glide in [ji], [yu] and [wo] appeared salient enough to be indicated in transcriptions, departing slightly from considerations of notational economy. However, it does not involve the noticeable change in vowel quality (formant movement) associated with the phonemic on-glide found in the complex rhymes, /jo/, /jɤ/, /jæ/, /wɤ/, /wæ/, /wa/ and /wɤ/. There is a potential for phonetic coalescence of onset-less syllables with the preceding syllable in polysyllabic words or tightly-knit polysyllabic expressions. For instance, I mistakenly believed, up until 2013, that the manner adverbials ‘in this way, thus’ and ‘in that way’ were /tsʰu+ni+/-/ and /tʰv+ni+/-/, respectively; these are in fact /tsʰu+ne+ ji+/-/ and /tʰv+ne+ ji+/-/, made up of a manner adverbial (/tsʰu+ne+/-/, /tʰv+ne+/-/) followed by the verb ‘to do’, /ji+/-/. Realization of the trisyllabic structure of these phrases did not come from phonetic evidence, but from their tonal behaviour. Consider example (xyz), shown here as initially transcribed:

(xyz) tsʰu+ni+/- | gwɤ+/-ni+/-mæ+/- |
 in_this_way-to_sing-CERT_STR-AFFIRM
 ‘This is how [they] used to sing!’ (Caravans.51, 53, 57)

If the notation /tsʰu+ni+/-/ were correct, it should be possible to link up the adverbial together with the following verb phrase into a single tone group, as /*tsʰu+ni+ gwɤ+/-ni+/-mæ+/-/ (about tone groups, see Chapter xyz). But this stylistic option is not open, which shows that there is a problem

with the analysis. The solution is that the correct notation of (xyz) is /tʂ^hu˧ne˧ ji˧ | gwɤ˧-ni˧-mæ˧/, where a H tone is moored on the verb ‘to do’, /ji˧/.

Unlike in Naxi, where /ɤ/ is realized as /yɤ/, in Na the vowel /ɤ/ never constitutes a syllable on its own. As will be seen in §2.6, the opposition between /ɤ/ and /a/ is restricted to a few contexts; synchronically, it may be considered to be neutralized in onset-less syllables.

No distinct onset portion is found for /y/, realized simply as [y].

Vowels /æ/ and /a/ may begin either with a glottal stop or with soft phonation: [hæ]~[ʔæ], [hɑ]~[ʔɑ]. As for the rhyme /ɿ/, it is not separated from the preceding rhyme by a glide or glottal stop: for instance, in /bv˧ɿ#˧/ ‘fly’ the /y/ and /ɿ/ follow each other: [byɿ].

2.5.2. *Hard phonetic onsets*

The rhymes /ə/ and /ɿ/ begin with a phonetic glottal stop when said in isolation, and also word-medially in hyperarticulated realizations: e.g. /sæ˧ɿ˧/ ‘bone’ is realized as [sæ˧ɿ˧] in careful speech, and as [sæ˧ɿ˧] in casual speech.

2.5.3. *The initial voiced uvular fricative /ɣ/ as a phonemicized empty-onset filler*

The situation of /wɤ/, /wæ/, /o/, /ɑ/ and /æ/ is especially interesting. These rhymes can combine with an initial voiced uvular fricative, /ɣ/. (Phonetically, this /ɣ/ is weakly articulated, and can be mistaken for /w/ in some hypoarticulated tokens.) Some of the words at issue appear to derive diachronically from onset-less syllables, such as ‘village’, /ɣwɤ˧/, corresponding to /wɤ˧/ in Naxi and Laze, and its homophone ‘mountain’, /ɣwɤ˧/, likewise corresponding to /wɤ˧/ in Naxi (where it means ‘hill, hillock’); others from syllables with an initial velar (or uvular) cluster, such as ‘sword’, /ɣæ˧mi˧/, corresponding to Naxi /ŋgæ˧/. (A process of hardening of initial glides has been reported in Zeluo Ersu, where “w- is sometimes pronounced with frication, as [ɣ^w-]”: Yu 2012, 11.)

The hardening of soft onsets should in principle result in the absence of any syllable realized as [wɤ], [wæ], [o], [ɑ] or [æ], since these became [ɣwɤ], [ɣwæ], [ɣo], [ɣɑ] and [ɣæ]. This is true for /wæ/: only [ɣwæ] is attested, not [wæ] (e.g. /ɣwæ˧/ ‘left, leftward’, corresponding to Naxi /wæ˧/ and Laze /væ˧/). For the other syllables, however, there exist oppositions

between syllables with and without a /ɣ/ onset: a process of structural gap-filling has taken place. Progress in the etymological study of individual examples will be necessary to understand the various processes whereby onsetless syllables were reintroduced into the system. The hardening of empty-onset fillers must date back a relatively long way, judging from the number of onsetless syllables that currently exist: e.g., for /wɣ/, the classifier for loads, /wɣɿ/; the classifier for generations, /wɣɿ/; ‘slave’, /wɣɿ/; ‘again, anew’, /wɣɿ/; ‘to detour past, to bypass’, /wɣɿ~wɣɿ/; and the final exclamative particle /wɣ/ (currently analyzed as toneless).²

The change from Proto-Naish *j to Na /z/ may be part of the same process of hardening. ‘To sleep’, Na /ziɿ/, corresponds to Naxi /jiɿ/ (phonemically a simple /i/, to which an empty-onset-filler gets added) and Laze /ziɿ/; the reconstruction proposed by Guillaume Jacques and myself is *jip.

2.6. The open vowels /a/ and /æ/, and the vowel /ɣ/

Na, Naxi and Laze all have an opposition between two open vowels. For Naxi, some authors transcribe them as /a/ vs. /æ/ (for instance He Jiren and Jiang Zhuyi 1985), others as /a/ vs. /æ/, others still as /a/ vs. /a/. The use of the symbol /a/ can therefore cause some confusion for linguists juggling with data from several sources and several languages. This leads me to adopt a notation as /a/ vs. /æ/ for all Naish languages. Phonetically, the vowel transcribed as /a/ is clearly a back vowel in Naxi, close to cardinal /a/, whereas in Na and Laze it is closer to /a/. I do not hear any cross-language difference in the pronunciation of the vowel transcribed as /æ/.

The sounds [a] and [ɣ] are contrastive in some contexts; although it is clear from their present-day distribution that the opposition used to be neutralized in most contexts, it is now becoming stronger through processes of structural gap-filling.

After labials, only [ɣ] and not [a] is found, but the combination /ma/ (contrasting with /mɣ/) has been introduced by Tibetan borrowings, as in the names /ɬuɿmaɿ/, /niɿmaɿ/ and /gyɿmaɿ/, and in /laɿmaɿ/ ‘priest, lama’, /maɿŋuɿdoɿbyɿ/ ‘pile of stones with sacred inscriptions, chorten’,

² The voiced uvular fricative /ɣ/ is not uncommon in this linguistic area, but with a widely different phonemic status from one language to another. For instance, in Lizu (Chirkova and Chen 2012), it is an allophone of the voiced velar fricative /ɣ/ in front of /ɐ/ and /wɐ/, e.g. /ɣɐ/ [ɣɐ] ‘needle’, /ɣwɐ/ [ɣwɐ] ‘to thunder’.

and /maɪpʰvɪ/ ‘butter’ (the second syllable is a Na adjective meaning ‘white’). Somewhat paradoxically, the first syllable of this word is perceived as semantically and phonemically different from /mɤ/ ‘animal fat’, even though ‘butter tea’ is /mɤɰiɪ/. The combination /ma/ is also found in the term of address /əɪmaɪ/, ‘Mum, mother’. Finally, there exists a clan name, /laɪmaɪ/, which also contains this syllable; it may be Tibetan in origin, but this could not be verified. In the remaining two items, the syllable /ma/ may result from vowel harmony: /maɪdzaɪ/ ‘solid ink’, and /maɪtsaɪ/ ‘origin, cause’.

After dental stops, lateral /l/ and /ɬ/, and nasal /n/, only [a] is found, except in /hiɪɬɤ/ ‘rapidly’, in the marginal sequences /dɤ.ɪ/ and /tɤ.ɪ/, and a single case of /dɤ/ (an expressive extra-distal demonstrative), discussed in §2.7.1. On the other hand, /a/ and /ɤ/ are contrastive after affricates and fricatives, e.g. /tsaɪ/ ‘busy’ vs. /tsɤɪ/ ‘greedy’ and /saɪ/ ‘hemp, *Cannabis sativa*’ vs. /sɤɪ/ ‘blood’.

Only [ɤ] is found after velars, and only [a] after uvulars.

After the glottal, /h/, there is an opposition between /a/ and /ɤ/: /haɪ/ ‘to open (one’s eyes)’ vs. /hɤɪ/ ‘to dry beside or over a fire’.

2.7. Marginal vowels and sequences

2.7.1. Dental stop plus /ɤ/

Few words contain a dental stop plus /ɤ/; the only two attested syllables are /dɤ/ and /tɤ/ (no /tʰɤ/). There exists an extra-distal demonstrative: ‘way over there’, realized as /dɤɪɪ-qoɪ/ or /dɤɪɪ-qoɪ/, with the locative /qo/ as its second syllable (like in /tɕʰuɪ-qo/ ‘here’ and /tʰɤɪ-qoɪ/ ‘there’). The pitch of the first syllable depends on the intended distance: a realization with a mild rise, transcribed as /dɤɪɪ-qoɪ/, points to a less distant place than a realization with a super-high, decreasing pitch, transcribed as /dɤɪɪ-qoɪ/. The same phenomena are observed for /dɤɪɪtʰvɪ-qoɪ/~/dɤɪɪtʰvɪ-qoɪ/ (same meaning, with added distal demonstrative) and /dɤɪɪtʰvɪ-giɪ/~/dɤɪɪtʰvɪ-giɪ/ ‘that side, way over there’. The expressive load of these phrases goes a great distance towards explaining oddities in the phonemes and tone of their first syllable, where the expressivity is at its strongest.

All the other examples of syllables /dɤ/ and /tɤ/ are found with a following /ɪ/, in stative verbs: /hɤɪ-dɤɪɪɪ/ ‘clumsy’, /õɪ-dɤɪɪɪ/ ‘fundamentally’ (from /õɪɪ/ ‘(one)self’), /ɕuɪ-tɤɪɪɪ/ ‘smooth (e.g. carefully planed wood)’, and /dɕuɪ-tɤɪɪɪ/ ‘humid, moist’ (from /dɕuɪ/ ‘water’).

These words contain a phonetic sequence which sounds like a trilled rhyme. They were initially transcribed as /dr/ and /tr/, adding another unit to the inventory of rhotic rhymes. This analysis appears correct for the phonological system of speaker F5 (F4's daughter-in-law): when repeating the phrase [hṽɪdrɪ~hṽɪdrɪ-zoŋ] 'clumsily' very slowly, she clearly syllabifies the phonetic sequence [dr] as one single syllable. In the speech of F4, phonetic realization is slightly less packed together, ranging between [dər] and [dæɹ], and there exists a phonological argument demonstrating that there are two syllables, not one: /tɹ.ɹ/. This argument comes from the noun /hoɪdzɯɪtɹɹɹ/ 'paste, starch', literally 'watery gruel', derived from /hoɹ/ 'porridge' and /dzɯɪtɹɹɹ/ 'humid, moist'. The noun carries H tone on its penultimate syllable and L tone on its final syllable. No HL falling tone (or any other falling tone, HM or ML) is ever observed on a single syllable in Yongning Na, so one is led to conclude that there are two syllables here.

Interestingly, the two tokens containing /tɹ/ have a variant with /dɹ/: /ʃɯɪɪ-dɹɹɹɹ/ for 'smooth', and /dzɯɪɪ-dɹɹɹɹ/ for 'humid, moist'. The reverse is not true: the two tokens containing /dɹ/ do not have a variant with /tɹ/; it is not acceptable to say /*hṽɪɪ-tɹɹɹɹ/ for 'clumsy', or /*ōɪɪ-tɹɹɹɹ/ for 'fundamentally'. This suggests that /-dɹ.ɹ/ was, at one stage, a suffix used to derive adjectives (also used adverbially). This suffix must have ceased to be productive quite some time ago, since two of the four examples underwent a separate phonetic evolution. It may, in fact, never have been highly productive.

2.8. A note on vowel harmony

Anticipatory vowel harmony ('right-to-left' harmony) is a salient phonetic tendency in connected speech in all the Naish languages studied so far. For instance, in Laze, /jiɪdyɪ/ 'family' is sometimes realised close to [jɪɪdyɪ]. This is not a phonological phenomenon: vowel oppositions on the first syllable of disyllables are not neutralized. But this phonetic tendency becomes lexicalized on some disyllables: for instance, 'pigswill' is /buɪɪ-haɪ/ (from /buɪ/ 'pig' and /haɪ/ 'food') in some Naxi dialects, including A-sher; in other dialects, including Nda-le, it has become /baɪɪ-haɪ/. (This phenomenon is reported by He Jiren and Jiang Zhuyi 1985, 11 but without mention of the dialects concerned.)

In detail, this phenomenon is highly language- and dialect-specific. Among the three Naish languages studied so far (Laze, Na and Naxi), Naxi is least prone to the lexicalization of such phenomena, and Laze most prone

to it. The lexicalization of vowel harmony sometimes goes hand in hand with other processes such as the voicing of intervocalic voiceless consonants. A typical example in Laze is /ʃie-ɫie-ɫmie-ɫ/ ‘seventh month’, from /ʃuu-ɫ/ ‘seven’ and /ɫie-ɫmie-ɫ/ ‘month’: in addition to the change in the vowel of the first syllable, note the voicing of /ʃ/ to /ɫ/.

In Na, the phonetic tendency towards regressive vowel harmony is especially strong for the vowel /æ/. For instance, /ŋwɣ-ɫ/ ‘five’ plus the monetary unit, /mæɭ/, is pronounced [ŋwæɫ-mæɭ] ‘five yuan’, although in careful (hyperarticulated) speech the pronunciation is [ŋwɣ-ɫ-mæɭ]. Also, function words are more susceptible to vowel harmony – this is one of the manifestations of their overall weaker realization. Here are two examples. (i) The ACCOMPLISHED, /le-ɫ-/, is realized close to [læ] when the vowel of the following verb is /æ/ or an apical vowel; vowel harmony for this morpheme is so strong that it was initially transcribed as /lə-ɫ-/, with a neutral vowel. (ii) The NEGATION, /mɣ-ɫ-/, is realized close to [ma] when the vowel of the following verb is an apical vowel; at one point (2009-2011), this morpheme was analyzed as /mə-ɫ-/, with a neutral vowel, until it was realized that vowel harmony was not exceptionally strong on this morpheme, and that its vowel did not require special phonemic status.

The sporadic lexicalization of vowel harmony sometimes create new phonotactic combinations. For instance, syllables containing a dental stop followed by /æ/, such as /læ/, /tæ/ and /tʰæ/, are scarce in Na, and most of them appear to originate in vowel harmony (see §3.2).

3. Consonants

3.1. Velar and uvular stops

Velar and uvular stops are in complementary distribution, except in front of /ɣ/, /wɣ/, and /o/, where they are contrastive, as shown in Table 6. A single instance of /qi/ (contrasting with /ki/) has also been found.

Table 6. Examples of the syllables /kʏ/, /qʏ/, /kʰʏ/, /qʰʏ/, /ko/, /qo/, /kʰo/ and /qʰo/.

/qʏ/		/kʏ/	
qʏɿ	handle	kʏɿ	garlic
qʏɿɿ	to frighten	kʏɿɿ	to be able to
qʏɿt͡sæɿ	throat	kʏɿt͡suɿ	nail
mæɿqʏɿ	tail	kʏɿd͡zuɿ	tent
/qʰʏ/		/kʰʏ/	
qʰʏɿɿ	six	mʏɿkʰʏɿɿ	smoke
qʰʏɿ	horn	kʰʏɿ	to cut (grass)
qʰʏɿ	hole	kʰʏɿ	dog
bʏɿqʰʏɿ	conch shell	kʰʏɿɿ	year
/qo/		/ko/	
qoɿ	to love	koɿ	hill
qoɿhoɿ	bamboo box	koɿ	to bask
qoɿqaɿ	mountain pass	koɿd͡zoɿ	flail
qo	LOCATIVE: inside	mæɿkoɿ	harness
/qʰo/		/kʰo/	
qʰoɿɿ	to kill	kʰoɿ	to spread (e.g. a sheet)
qʰoɿloɿ	wheel	kʰoɿloɿ	prayer wheel
qʰoɿtvɿ	tree stump	tseɿkʰoɿ	sanctuary
qʰoɿmʏɿ	straw hat	hæɿkʰoɿ	princess, young lady
/qi/		/ki/	
qiɿqiɿ	originally, at first	kiɿ	to give

This situation is unsurprising in areal context. In Lizu, “(v)elar and uvular stops contrast before /o/, e.g., /^Rko/ ‘to beg’ vs. /^Fqo/ ‘hole, pit’. Elsewhere, they are in complementary distribution” (Chirkova and Chen 2012).

3.2. Retroflex stops and affricates

Yongning Na has (i) an opposition between dental and retroflex affricates, with a high functional load, and (ii) an opposition between dental and retroflex stops and nasals, but only in front of /i/, /æ/, /ʏ/ and /o/. Examples include: /t͡ʰiɿ/ ‘tired’ vs. /t͡ʰiɿ/ ‘to plane (wood)’; /t͡ʃiɿ/ ‘to get up’ vs. /tiɿ/ ‘to

knock, to tap (lightly)'; /t̤æɫbɣɫ/ 'Buddhist priest' vs. /t̤æɫpvɫ/ 'thin, skinny'; /d̤oɫ/ 'to allow, to permit' vs. /doɫ/ 'to climb'. After retroflex consonants, /o/ is realized close to [u].

The consonants transcribed as retroflex are articulated much less to the back than canonical retroflex sounds such as those of Indian languages; a palatographic study may reveal that they are postalveolars rather than retroflexes. In the absence of distinct International Phonetic Alphabet symbols for postalveolar stops, the simplest solution is to use retroflex symbols and retain the label 'retroflex'.

3.3. Laterals /l/ and /ɭ/, and the retroflex approximant /ɻ/

The laterals /l/ and /ɭ/ are contrastive in Yongning Na, as demonstrated by pairs such as /liɫ/ 'to look' vs. /ɭiɫ/ 'month' and /loɫɭ/ 'thick' vs. /ɭoɫɭ/ 'deep'. Phonetically, the voiced lateral /l/ has a broad perimeter of allophonic variation. It is realized as retroflex in front of /u/, e.g. in the classifier for round objects such as bowls and grains (also serving as generic classifier). The phonemic analysis /lu/ for this syllable was only arrived at after the greatest of hesitations: a broad range of options was considered, including [ɭu], [ɭu], [lɥ], [ly], [ly] and syllabic [ɭ] or [ɻ]. The entire syllable is articulated loosely: the initial is close to an approximant, and the vowel quality is not precise, so that the syllable often resembles a monophonemic [ɭ].

In front of /ɥ/, the voiced lateral /l/ is slightly retroflex. In all contexts, /l/ is accompanied by some friction. This characteristic is at its clearest before the high front vowel /i/, but it is also observed before open vowels, including /a/ and /æ/. Phonetically, it may therefore be more adequate to transcribe this allophone as [ɭ] rather than [l]. Phonologically, it would be economical to consider that the two laterals are distinguished solely by the feature of voicing; this also argues in favour of a notation as /ɭ/.

The compromise choice made here for the sake of simplicity consists in using a notation as /l/ rather than /ɭ/. On the other hand, a retroflex initial is used in the transcription of the syllable [ɭu] (phonemically: /lu/) to reflect what I perceive as a great phonetic distance between the realization of /l/ in this context and in all others. As in the case of the syllable [ɲi], which can be phonemicized as /ɲi/, it appeared better to keep the transcriptions close to the surface forms (note that a similar choice is made by Yu 2012, 8).

These observations on the allophonic variation of /l/ shed indirect light on the distribution of the retroflex approximant /ɻ/: this may well have

originated as an allophone of /l/ which drifted to such a phonetic distance that it opened a structural gap that was later filled through borrowings and processes of vowel harmony. The present-day /ɬ/ initial of Yongning Na appears only in the syllables /ɬæ/ and /ɬwæ/, which correspond to the syllables /læ/ and /lwæ/ in Laze, e.g. ‘to shout, to cry’: Na /ɬwæ/̄, Laze /lwæ/̄, and ‘seed’: Na /ɬæ/̄, Laze /læ/̄. (Roselle Dobbs [p.c.] indicates that in villages that belong to the area referred to in Na as /lɑtʰɑt-di/̄, to the east of lake Lugu, these items retain the lateral initial.) Synchronically, /ɬæ/ contrasts with /læ/, but the latter only appears (i) in borrowings, such as /lætsu/̄ ‘chili peppers’, from Southwestern Mandarin 辣子 [la.tsɿ], (ii) in the ACCOMPLISHED particle /lə/, whose phonetic realizations, determined by the vowel of the following verb, include [læ], and (iii) in words where the /æ/ could have resulted from vowel harmony, e.g. /læɬæ/̄ ‘raven’. (Regressive vowel harmony, which becomes sporadically lexicalized, is a salient phonetic tendency in Na: see §2.8.) As for the syllable /ɬwæ/, there exists no lateral counterpart /lwæ/. It can therefore be hypothesized that present-day /ɬæ/ and /ɬwæ/ originated in earlier /læ/ and /lwæ/, which became phonetically closer to [ɬæ] and [ɬwæ], thus leaving empty these phonetic slots; the [læ] slot was then occupied by other syllables. Needless to say, these diachronic reflections do not detract from the synchronic phonemic status of /ɬ/.

A tantalizingly similar situation is found in Lizu, where the /ɬ/ phoneme only occurs before /æ/, /ə/, and /wæ/, e.g. /^Fɬæ/ ‘yak’, /^Rɬə/ ‘to laugh’, and /^Rɬwæ/ ‘chicken’ (Chirkova and Chen 2012). This is not due to language contact but to similarities in cross-linguistic (panchronic) regularities in phonological erosion, a domain which clearly warrants more research.

3.4. The glottal fricative /h/, and the sound [f]

Na has a glottal fricative /h/. At an earlier stage of the language, the sound [f] can be hypothesized to have been entirely absent, since early Chinese borrowings with initial [f] in the donor language were reinterpreted as having initial /h/: ‘method, solution’, 办法 (Standard Mandarin: *bànfǎ*) was borrowed as /pæɬhwæ/̄.

The sound [f] appears in more recent layers of borrowings, however. A plausible scenario is that /h/ in front of oral rhymes came to be realized in Na with a friction source at a point in the vocal tract determined by the following vowel, e.g. palatal before /i/ and labial-dental before /ʏ/, hence [çi] and [fʏ]. Once the sound [f] had thus set foot in Na (on a phonetic lev-

el), the way was paved for the introduction of [f]-initial loanwords. In the present state of the language, Na speakers do not have any problems pronouncing a [f] sound in front of rhymes other than /ɤ/, as in the commonly used Chinese borrowing [fa] (e.g. for Chinese *fā* 发, as in *fājiào* 发酵 ‘to ferment’).

This can be taken as evidence that the sound [f] is no longer perceived by the speakers as an allophone of /h/. It is well-known that allophones that have drifted far apart may acquire psychophonetic independence from one another, witness the much-studied cases of German [ç] and [x], and Standard Mandarin [ç] and [x]. As the psychological reality of the underlying unity between allophones wanes, the resistance against structural gap-filling decreases.

In view of this situation, and also in order to keep the transcriptions close to the surface forms, the syllable [fɤ] is transcribed as such, rather than as /hɤ/. Under a flatly synchronic analysis that includes Chinese borrowings, the sound [f] would need to be granted phonemic status. Since a clear evolutionary scenario can be proposed explaining its relatively recent introduction, it may be misleading to include it among the list of consonants, however. It was therefore deliberately omitted from in Table 1.

The combination /hi/ retains a relatively back articulation; this appears to be motivated in part by its opposition with /çi/, which would be threatened by further fronting. The combination [çi] is here transcribed as /hi/.

4. Comments about the inventory of syllables

Numerous phonemic oppositions are found in highly restricted contexts in Yongning Na; in Praguaian terms, these constitute extreme cases of neutralization. [xxxx TO BE EXPANDED]

From a dynamic point of view, gaps in the inventory of syllables provide structural hints about past evolutions and current tensions within the system.

4.1. Combinations of a dental stop and /æ/ vowel are probably recent

Combinations consisting of a dental stop followed by /æ/ are scarce. The only example for /dæ/ is /læɗdæɗqæɗ/ ‘armpit’; the two examples for /tæ/ are /tæɗɗæɗ/ ‘Adam’s apple, oesophagus’ and /tæɗpvɗ/ ‘thin, skinny’; the only example for /tʰæ/ is /tʰæɗɗæɗ/ ‘book’. All of these except /tæɗpvɗ/ ‘thin,

skinny’ can be explained as resulting from vowel harmony. Na /tʰæɪɬæ/ ‘book’ corresponds to Laze /tʰaɪɬ/ and Naxi /tʰeɪɬuɪ/; the vowel correspondence /e:æ:a/ is otherwise unattested, reinforcing the hypothesis that vowel harmony or some other exception-causing force was at play here. Na /tæɪɬæ/ ‘Adam’s apple, oesophagus’ corresponds to Labai Na /taɪɬ/, again an irregular correspondence, as the regular correspondences are simply /æ::æ/ and /a::a/. (Throughout this book, correspondences between language varieties are indicated with a pair of colons, following standard practice in comparative-historical linguistics.)

4.2. After alveolopalatals, two options for analysis: /o/ and /jo/

The syllables transcribed as /tɕʰo/, /tɕo/ and /dzo/ could also be analyzed as /tɕʰjo/, /tɕjo/ and /dɕjo/, with a /-jo/ rhyme. The correspondence between Na /dzo/ and Naxi /gy/ (phonetically: [jy]) suggests that the initial became palatalized in Na by a following high front vowel or glide. From a synchronic point of view, however, it seemed more appropriate to transcribe these syllables as composed of an alveolo-palatal initial followed by a back vowel.

4.3. A possible reanalysis dispensing with a phonemic retroflex nasal

There exists one single instance of /ɲy/: /ɲy/ ‘to sniff; to get to know (news)’, often used in the negative: /məɪ-ɲy/ ‘[I] don’t know’. This syllable contrasts with /ny/, e.g. /ny/ ‘to bury’. Another possible analysis would be as [ɲɿ], phonemically /ɲɿ/, in which case one could dispense with positing a /ɲ/ consonant phoneme contrasting with /n/: retroflex realizations would be conditioned by a following /u/ or /ɿ/, the combinations /nu/ and /nɿ/ being realized as [ɲu] and [ɲɿ], respectively. In the absence of a phonemic opposition, and given the phonetic proximity between these two rhymes in a retroflex context, this interpretation is not absurd. The next logical step in that perspective would be to reinterpret /ɲy/, /ɲy/ and /tʰy/ as /dɿ/, /tɿ/ and /tʰɿ/.

This does not represent a real economy, however, since there exists an opposition between dentals and retroflexes in front of other vowels (e.g. /ti/ vs. /ti/). The choice to transcribe as /ɲy/ is based on my auditory impression that, in the present state of the system, the rhyme is closer to [y] than to [ɿ].

5. Articulatory reduction: reduced forms and their lexicalization

Phenomena of articulatory reduction pave the way for the lexicalization of new forms, sometimes resulting in the creation of new syllabic combinations. Some salient examples are presented below.

The grammatical word /ji/ ‘to do’ is prone to reduction. Reduction is well on its way towards lexicalization for /gwɔji/ ‘really, truly’ (from /gwɔ/ ‘authentic, true’), realized as [gi] except when hyperarticulated. Phonetic reduction is common, e.g. /no | ətso | ji | bi |/ ‘What are you going to do?’ (2SG-INTERROGATIVE:-what-to-do-IMMEDIATE_FUTURE) is commonly realized in a hypoarticulated way that can be approximated as [no | x | tsɔ | bi |].

The RELATIVIZER /hi/ is articulated much more weakly than the lexical word /hi/ ‘human being, person’. The initial fricative is often strongly reduced: it gets voiced throughout. Before a voiced stop, realizations as a nasal consonant (nasal stop) are observed, as in Figure xyz, representing the sequence /qwa | fi | hɪ | dɪ | y | ni |/ ‘(S)he is really happy!’, realized as [qwa | fi | ndɪ | y | ni |]. (Roselle Dobbs [p.c.] indicates that some younger speakers are not aware that the RELATIVIZER /hi/ is present, and omit it altogether in some contexts.)

[INSERT FIGURE FVNDEEVNHI_F5.EPS HERE]

Figure 1. An illustration of the reduction of the relativizer to a nasal consonant

The phrase /tʰæ | mi | ɲu |/ ‘really, actually’ is generally reduced to a lengthened monosyllable which can be approximated as [tʰæ̃ |], sometimes with a trace of the final L tone of the full expression: [tʰæ̃ |̃ |]. In the absence of a length opposition among vowels, the reduced form is unlikely to become lexicalized.

The proximal demonstrative /tʰu |/ in association with a following plural clitic / = ɲæ |/ yields /tʰu | = ɲæ |\$/ ‘these things, this sort of things’, and the distal demonstrative yields /tʰy | = ɲæ |\$/ ‘those things’. These disyllabic forms are strongly coalescent. Regressive vowel harmony exerts itself strongly, yielding instances resembling [tʰæ̃ | = ɲæ |], e.g. in Caravans.153 and Agriculture.109. Weakening of the already vowel-like approximant further simplifies the form to such an extent that it often resembles a monosyllable, [tʰæ̃ |] or [tʰæ̃ |]. Examples include Mountains.83, 109, Funeral.190, BuriedAlive3.50, and Caravans.160, 165.

The exclamative final particle, /wɤ/, which conveys obviousness, tends to fuse with a preceding copula, /ni/, the combination /-ni-wɤ/ being realized close to [-no]. This is well-attested in F5's narratives, and highly frequent in the speech of M21.

6. Phonostylistic observations (TO BE REWRITTEN)

The phonetic realization of phonemes is affected by a range of factors. The study of how phonetic details reflect the speaker's communicative purposes has been called 'phonostylistics' (for a review of early work: Léon 1969). The term 'psycho-phonetics' used by Fónagy 1983 is less specific and therefore perhaps less appropriate, although it has the advantage of bringing out the considerable range of application of this strand of research. If intonation is "a symptom of how we feel about what we say and how you feel when you say it" (Bolinger 1989, 1), phonostylistics is part and parcel of intonation studies.

Salient cases of modification of vowels and consonants for expressive effects in Na include the following.

6.1. Lip rounding and protrusion with demonstrative (proximal) value

The vowel /u/ has neither lip rounding nor lip protrusion. It acquires lip protrusion when the phrase /tɕʰuɪ-luɪ/ 'this one' (proximal demonstrative plus generic classifier) is used as a real-world demonstrative, pointing to an object within sight. The speaker's face points in the direction of the object, and lip protrusion functions as part of the gesture of pointing. It is often accompanied by an upward movement of the chin, further reinforcing the pointing gesture.

6.2. Palatalization conveying a tender emotion

The adjective /ŋuɪɕi/ 'lovely' can be pronounced close to /niɪɕi/. This child-speech-like variant has iconic value: palatalization, narrowing the vocal tract, is associated with smallness (Fónagy 1983, 22–23). The realization of this cross-linguistic tendency is facilitated here by the tendency towards regressive vowel assimilation found in Na and other Naish languages.

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Notes

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Chapter 3

Lexical tones

1. Introduction

This chapter focuses on the lexical tones of nouns and verbs, which constitute a fundamental aspect of the tone system. Because tonal oppositions are partly neutralized when words are spoken in isolation, issues concerning the behaviour of tone in context will also be broached in this chapter, which thus serves as an introduction to the essentials of the Yongning Na tone system.

2. The tones of nouns

This chapter is organized in analytical order. It starts out from a static inventory of tone patterns over domains of different lengths, and gradually progresses towards an analysis. This mode of exposition replicates the progression of analysis during fieldwork, working up from the surface facts; the aim is to allow the reader to evaluate the analysis step by step, and to reflect on possible alternatives, instead of proposing a complete analysis from a top-down perspective.

2.1. A static inventory of tone patterns

Words spoken in isolation are what one starts out from in the earliest stages of fieldwork. Table 1 presents an overview of the tone patterns over monosyllables spoken in isolation. It was not possible to find a minimal set (words distinguished solely by tone) due to the relatively low number of monosyllabic nouns in the language.

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Table 1. Tone patterns attested over monosyllabic nouns spoken in isolation

phonetic realization	preliminary label	example
non-rising, non-low	M ?	zwæ ‘horse’
low-rising	LM ? LH ?	bo ‘pig’
mid-rising	MH ?	tʂ ^h æ ‘deer’

The second column of Table 1 proposes a preliminary analysis of the three patterns into level tones: L(ow), M(id), H(igh), and their combinations. Justification for the use of a level-tone analysis comes from morpho-phonological alternations in which the tones partake; pieces of evidence will be provided in the course of the analysis. The question-mark in the column ‘preliminary label’ is intended to emphasize that these labels were given in a first pass; some were modified later on in the course of the analysis, as will be explained below. At this initial stage, the essential information is that provided in the leftmost column in Table 1, describing the three patterns as follows: a non-rising, non-low pattern; a low-rising pattern; and a mid-rising pattern.

The restrictions on the tones of monosyllables spoken in isolation are the following. (i) There are no examples of falling contours. (ii) There is no opposition between a high tone and a mid tone: only one type of non-low, non-rising tone is observed. Its realizations occupy the entire upper part of the tonal space, varying from mid to high, with a flat or falling contour. The choice of the label M (rather than H) for this pattern will be explained further below, at the stage of phonological analysis. (iii) There is only one contour that starts on a low pitch. Using level-tone labels, this observation can be stated as follows: there is no opposition between LM and LH. (iv) There are no examples of low, non-rising tones.

The three surface patterns for monosyllables are the same for other word classes, such as verbs and adjectives.

Over disyllabic nouns, seven patterns are observed, as shown in Table 2.

Table 2. Tone patterns attested over disyllabic nouns spoken in isolation

1 st syllable	2 nd syllable	preliminary label	example
non-low	low	M.L ?	/da.ji/ 'mule'
non-low	low-rising	*M.LM	*
non-low	mid-rising	M.MH ?	/hwɤ.li/ 'cat'
non-low	mid	M.M ?	/po.lo/ 'ram'
non-low	high	M.H ?	/hwæ.tʂæ/ 'squirrel'
low	low	*L.L	*
low	low-rising	L.LM ? L.LH ?	/k ^h v.mi/ 'dog'
low	mid-rising	L.MH ?	/õ.dɤ/ 'wolf'
low	mid (or high)	L.M ? L.H ?	/bo.mi/ 'sow'

Table 2 includes two unattested combinations, marked with an asterisk (*) in the *example* and *preliminary label* columns. If the tone of the first syllable is non-low, there are four observed tonal patterns on the second syllable: low; mid; high; or mid-rising. If the tone of the first syllable is low, there are three attested patterns on the second syllable: low-rising; mid; or mid-rising.

The restrictions on the distribution of tones on disyllables can be described as follows.

- (i) Only two tones contrast on the first syllable: low and non-low. There can be no contour on the first syllable.
- (i) A Mid tone cannot be followed by a low-rising tone.
- (ii) A disyllable cannot be low throughout, any more than a monosyllable can.
- (iii) There is no contrast between a low + mid pattern and a low + high pattern.

There are also strong limitations on tone patterns over three syllables: only twelve patterns are attested. The data in Table 3 are from trisyllabic nouns whose degree of lexical integration ranges from transparent compounds, such as 'Year of the Dragon', to fully undecomposable words, such as 'lips'. A hyphen is placed between the two parts of decomposable compounds.

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Table 3. Tone patterns attested over trisyllabic nouns spoken in isolation

1 st σ	2 nd σ	3 rd σ	preliminary label	example	gloss
non-low	mid	mid	M.M.M ?	dʒɿ.q ^h wɿ.tʃe	awl
non-low	mid	low	M.M.L ?	mɿ.gɿ-k ^h ɿ	year of the Dragon
non-low	mid	high	M.M.H ?	njo.bi.li	lips
non-low	mid	mid-rising	M.M.MH ?	bɿ.zɿ-k ^h ɿ	year of the Serpent
non-low	low	low	M.L.L ?	mo.jo.mi	owl
non-low	high	low	M.H.L ?	æ.tse.p ^h æ	kneebone
low	low	mid	L.L.M ?	t ^h o.k ^h ɿ.mi	male dog
low	low	low-rising	L.L.LM ?	dʒu.na.mi	wilderness
low	mid	mid	L.M.M ?	t ^h a.zwæ.mi	donkey
low	mid	high	L.M.H ?	æ.li.p ^h æ	mirror
low	mid	mid-rising	L.M.MH ?	bi.p ^h ɿ-dʒu	flood
low	mid	low	L.M.L ?	bæ.bɿ-bɿ	ladybird

Since there is a three-way opposition on the second syllable, these are labelled as ‘low’, ‘mid’ and ‘high’, whereas for the first syllable, where there is no opposition between mid and high, they are simply labelled ‘low’ and ‘non-low’.

In view of the three tables above, the following generalizations can be proposed:

- (i) A mid (non-low) tone can be followed by one of four tones: low, mid, high, or mid-rising.
- (ii) A low tone can only be followed by low-rising, mid or mid-rising.
- (iii) A high tone can only be followed by a low tone.
- (iv) Non-final syllables never carry a contour.
- (v) An entire word cannot carry low tone on all of its syllables.
- (vi) There can never be a trough: a tone surrounded by higher tones (non-low followed by low followed by mid, for instance).

From the above data alone, it is not possible to know whether these generalizations concern the level of the word, the phrase, or entire sentences, since “words produced in isolation are minimal utterances showing both lexical and utterance-level (post-lexical) features” (Himmelman 2006, 164). To preview the result of later analysis, the relevant domain is the *tone group*, a unit in-between the word and the utterance (see Chapter xyz).

A dynamic approach to the tones of nouns sheds light on the above generalizations about static inventories. While reading through the following section, the reader may want to make an occasional leap forward to Table 5, which presents a synthetic overview of the full picture of the tone system for nouns as it finally emerges from the analysis.

2.2. A dynamic view, bringing out six underlying tonal categories for monosyllabic nouns, and eleven categories for disyllabic nouns

2.2.1. *Monosyllabic nouns*

It was mentioned above that there are three patterns for monosyllables spoken in isolation: low-rising; non-low; and mid-rising. The set of nouns realized as non-low in isolation is not homogeneous, however, witness the behaviour of /jo/ ‘sheep’, /zwæ/ ‘horse’ and /la/ ‘tiger’, all of which are realized with a non-low tone in isolation. In association with the copula, these yield: /joɹ̩ ɲiɹ̩/ ‘is (a/the) ram’, with low tone on the noun and rising tone on the copula; /zwæɹ̩ ɲiɹ̩/ ‘is (a/the) horse’, with mid tone on the noun, and high tone on the copula; and /laɹ̩ ɲiɹ̩/ ‘is (a/the) tiger’, with mid tone on the noun and low tone on the copula. Since the morphosyntactic context is the same, these three words must be considered as representatives of three different lexical tones. These three tones all neutralize to non-low when the noun is spoken in isolation.

The set of nouns realized as low-rising in isolation is not homogeneous either: in some contexts, such as object+verb combinations, /zæ/ ‘leopard’ and /bo/ ‘pig’ have different behaviours. For example, ‘...has bought leopards’ is /zæɹ̩ hwæɹ̩-zeɹ̩/, with a L tone on the accomplished suffix, whereas ‘...has bought pigs’ is /boɹ̩ hwæɹ̩-zeɹ̩/, with M tone on the suffix.

To sum up, out of the three surface patterns on monosyllables in isolation, one (MH) corresponds to a single phonological set: all the words realized with MH tone in isolation have the same tone pattern in a given morphosyntactic context. The two others constitute the neutralization of underlying patterns: the low-rising contour corresponds to two underlying categories, and the non-low tonal realization corresponds to three categories. A dynamic view thus brings out six tonal categories of monosyllables.

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2.2.2. Disyllabic nouns

The same procedure as above was also applied to disyllabic nouns, i.e. looking at the behaviour of nouns in different morphosyntactic contexts, in order to find out how many tone classes need to be distinguished.

It was discovered that the nouns realized with a M.M pattern in isolation belong to two distinct types: one after which the copula carries L tone; and one after which the copula carries H tone. One set is illustrated by /poŋlo/ ‘ram’, /poŋloŋ ni/ ‘is (a/the) ram’. The other is illustrated by /zɣwæŋzo/ ‘colt’, /zɣwæŋzoŋ ni/ ‘is (a/the) colt’.

Likewise, the nouns realized with a M.H pattern in isolation make up two distinct sets, the one illustrated by /kɣŋse/ ‘flea’, /kɣŋseŋ ni/ ‘is (a/the) flea’, the other by /hwæŋtɕæ/ ‘squirrel’, /hwæŋtɕæŋ ni/ ‘is (a/the) squirrel’.

Finally, the nouns realized with a L.M pattern in isolation (which could also be transcribed as L.H: there is no opposition between a L.M pattern and a L.H pattern, as mentioned above) fall into no less than three categories. These three categories are brought out by intersecting evidence from two contexts: with a following copula, and with a following possessive, as shown in Table 4.

Table 4. Examples illustrating the existence of three tone categories neutralized to L.M in isolation

in isolation	gloss	with copula	with possessive
/boŋmi/	sow	boŋmiŋ ni	boŋmiŋ-by
/boŋta/	boar	boŋtaŋ ni	boŋtaŋ-by
/naŋhɪ/	Naxi	naŋhɪŋ ni	naŋhɪŋ-by

Addition of the copula sets apart a class exemplified by ‘Naxi’, after which the copula receives H tone. Addition of the possessive sets apart a class exemplified by ‘boar’, which depresses the tone of the possessive to L, as opposed to its realization as M for the other words. While the evidence used to bring out the tone classes is morphotonological – looking at the behaviour of nouns in context –, the tone classes must be described as lexical, since the difference in the surface-phonological tone strings shown in Table 4 must be ascribed to a difference between the lexical items at issue, and hence, to a difference in lexical tone category.

In total, this yields eleven tonal classes of disyllables.

2.3. A phonological analysis of the tone categories of nouns

As reported in the preceding paragraphs, a number of tonal categories were brought out on the basis of their different behaviour in various morphosyntactic contexts. The phonological analysis of these categories is up against an issue of circularity, since the tone categories of the simplest units – monosyllabic nouns – can only be brought out by examining their combinations with various other morphemes whose tones, at this stage, have not been analyzed either. In practice, however, bootstrapping is often required when analyzing a new language variety: groping for a correct analysis by trial and error.

A step forward in the analysis of the tones of nouns was made possible by progress in the analysis of the tones of other morphemes: through an analytic process set out further below, it was realized that the copula carried L tone, and that the possessive carried M tone (it can also be analyzed phonologically as toneless). On this basis, it became possible to propose a phonological analysis for each of the tones.

The two tonal categories of nouns illustrated by /laɫ ɲiɫ/ ‘is (a/the) tiger’ and /zɰwæɫ ɲiɫ/ ‘is (a/the) horse’ were reanalyzed as follows. In the first case, the copula surfaces with its own lexical tone. ‘Tiger’ represents the simplest case, analyzed as having M tone: a phonological tone identical with the surface tone in this context. (The same analysis can be proposed for the category of disyllables illustrated by /poɫloɫ/ ‘ram’.) In the second case, ‘horse’, the copula surfaces with a H tone which must be supposed to be projected onto it by the noun. ‘Horse’, therefore, exemplifies a tone category characterized by a H tone which can only surface on a following syllable: a floating H tone. This phenomenon warrants a separate subsection for in-depth discussion.

2.3.1. A floating H tone, with comparative evidence pointing to its origin

The floating H tone is never realized on the word itself, and can only be realized after the word. The case of ‘colt’, realized in isolation as /zɰwæɫzoɫ/, offers a neat opportunity to extend the analysis to disyllables. The H tone that appears in /zɰwæɫzoɫ ɲiɫ/ ‘is (a/the) colt’ is interpreted as reflecting the floating H tone lexically attached to the noun ‘colt’.¹

¹ A more detailed account will be presented in Chapter xyz, when describing combinations between objects and verbs. The rules yielding the surface-phonological tone pattern are morphosyntactically conditioned; not all

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Since this is the only type of H tone that may be lexically attached to a monosyllable, it is convenient to transcribe it as a simple H tone on monosyllabic nouns in the glossary and in examples within this volume: e.g. ‘horse’ is transcribed as /z̥wæ̃/. For disyllables, however, there is an opposition between this floating H tone and a word-final H tone (as in /hwæ̃t̥sũ/ ‘rat’). This complexity of syllabic anchoring makes it necessary to use a nonstandard symbol: a symbol not used in the International Phonetic Alphabet. Desperate tones call for desperate measures. The pound symbol # was (arbitrarily) chosen to stand for the end of a lexical word, adopting notation of the word as /z̥wæ̃t̥zõ#/, and of the tonal category as #H.

To repeat this important point with another example, the #H-tone word ‘little brother’ and the M-tone word ‘little sister’ have the same tonal pattern in isolation (M on both syllables: /gĩt̥zũ/ ‘little brother’, /gõt̥mĩ/ ‘little sister’), but the former yields /gĩt̥zũt̥nĩ/ ‘...is little brother’ (tone sequence: M.M+H), the latter /gõt̥mĩt̥nĩ/ ‘...is little sister’ (tone sequence: M.M+L). The analysis proposed is that ‘little brother’ has a final H tone which remains unassociated unless it can associate to a following syllable: a H tone that is floating at the end of the word. The association of this floating H tone requires specific morphosyntactic conditions. For instance, the possessive, as a clitic, is not a suitable host for a floating tone; it receives M tone (by default), leaving the H tone unassociated (and thus not surfacing in the resulting pattern), hence /gĩt̥zũt̥bṽ/ ‘...of (a/the) little brother’, tonally identical to /gõt̥mĩt̥bṽ/ ‘...of (a/the) little sister’.

Observations on a neighbouring dialect, that of the village of /p̥h̥ṽt̥dzõ#/ (in Chinese: Labai 拉伯村; see map, p. xyz), later offered indirect supporting evidence for the analysis of the H tones of Yongning Na. My only contact with the Labai dialect so far has been through two work sessions with Mr. Lamu Gatusa, a researcher at the Academy of Social Sciences in Kunming. (His name in Na is /l̥ãt̥mbṽt̥ k̥x̃t̥t̥ṽl̥sq̃/, 拉木•嘎吐萨; his pen-name is Shi Gaofeng 石高峰.) The monosyllables of Yongning Na analyzed as having a H tone correspond to monosyllables with H tone in Labai. When a word is spoken in isolation, the H tone does not surface in isolation in Yongning Na (where M and H are neutralized to M in isolation), whereas it is realized as H in Labai. The H::H correspondence among monosyllables is the tonal correspondence that has

combinations of a #H tone and a L tone yield a /M...M.H/ sequence. To preview the result of analyses set out in Chapter xyz, nouns plus the copula behave tonally like object-verb combinations.

the most examples. The only exceptions are (in the order Labai::Yongning) /hōl::lōl/ for ‘rib’, perhaps due to dialect mixture, and the correspondence /hǎl::hǎl/ for ‘gold’, for which no explanation can be offered at present. The M::M correspondence is also widely attested; for monosyllables, it is exceptionless: all the monosyllables that have M tone in Yongning Na correspond to M-tone monosyllables in Labai. Examples are presented in Table 5. (A recording of some of the words is available online from the Pangloss Collection; the title of the resource is: M28_Vocabulary.)

Table 5. Examples illustrating the H::H tone correspondence between Yongning and Labai on monosyllabic nouns

gloss	Yongning	Labai	gloss	Yongning	Labai
earth	tʂeᵛ	tʂiᵛ	urine	dʒuᵛ	ŋdʒuᵛ
hail	dzoᵛ	dzoᵛ	gall	kuᵛ	kuᵛ
sky	mvᵛ	mvᵛ	blood	sɣᵛ	sɣᵛ
fire	mvᵛ	miᵛ	head	ɤoᵛ	ɤoᵛ
star	kuᵛ	kuᵛ	Pumi	bɣᵛ	bɣᵛ
snow	biᵛ	mbiᵛ	man	zoᵛ	zoᵛ
pond	ɖwæᵛ	ŋɖwæᵛ	bronze	æᵛ	æᵛ
canal	qʰæᵛ	qʰæᵛ	salt	tsʰeᵛ	tsʰeᵛ

On disyllables, the floating H tones of Yongning correspond to H tones in Labai. Disyllables that have M tone in Yongning likewise carry M tone on both of their syllables in Labai; disyllables that have #H tone in Yongning have a H tone on their second syllable in Labai. Some examples are provided in Table 6.

Table 6. Examples illustrating the M::M and #H::MH tone correspondences between Yongning and Labai on disyllabic nouns

<i>M::M tone correspondence</i>			<i>#H::MH tone correspondence</i>		
gloss	Yongning	Labai	gloss	Yongning	Labai
little sister	gołmił	gołmił	little brother	giłzuł#ł	gułzuł
ancestor	əłp ^h vł	əłp ^h əł	grandson	zyłv#ł	zyłvł
Bai	fiłbvł	liłbvł	granddaughter	zyłmił#ł	zyłmił
mother	əłmił	əłmił	sole	miłbx#ł	miłbxł
body	gvłmił	gvłmvł	nose	niłgx#ł	niłŋgxł
heel	mvłt ^h uł	miłt ^h uł	craftsman	połdzuł#ł	połdzył
thigh	dołbæł	dołbæł	forehead	tołkx#ł	tołkxł
buttock	dołbvł	dołbvł	host	dałpv#ł	ndałpvł
nostril	niłq ^h vł	niłq ^h əł			
back	gvłdvł	gvłdvł			
breast	kałpvł	ŋgałpvł			
belly	biłmił	biłmił			
plait	hæłpxł	hæłpxł			
sun	niłmił	niłmił			
moon	fiłmił	liłmił			
stone	lvłmił	lvłmił			
powder	tsałbxł	tsałmbał			
hot spring	łłq ^h vł	əłq ^h əł			
paddy field	ciłlvł	sułlvł			

Another neighbouring dialect, that of the village of Wujiao 屋脚, just across the border with the county of Muli in Sichuan (四川凉山州木里县屋脚乡), offers the same confirmation: lexical field notes kindly communicated in 2012 by Xu Duoduo 许多多, then a graduate student at Tsinghua University, reveal that words with H tone in Yongning Na (neutralized with M in isolation) have an overt H tone in Wujiao. This H tone is phonetically transcribed by Xu Duoduo as ⁵³ (high-to-mid) on the basis of commonly observed realizations in isolation, but in the absence of a ⁵⁵ (high level) tone in her notes this can confidently be interpreted as a H tone. Here is a handful of examples: /k^hv⁵³/ ‘dog’; homophone: ‘to steal’; ‘garlic’, /k^hv⁵³/; and ‘hair’, /h^hv⁵³/. No counterexample has been observed so far.

The above comparisons provide neat confirmation from comparative evidence for the H tone category independently postulated for Yongning

Na. Needless to say, the tonal correspondences between Yongning, Labai and Wujiao call for a systematic investigation, based on much more extensive data than could be collected so far. The tone system of Labai warrants an in-depth study in its own right, and a detailed comparison with Yongning. The tone system of Wujiao appears at first blush to be highly similar with that of Yongning. Some speculations about the evolutionary processes whereby a H tone became floating in Yongning will be presented in Chapter xyzU, “Dialectology and diachrony”.

2.3.2. *Word-final and morphological-nucleus-final H tones*

It was mentioned above that the words ‘squirrel’ and ‘flea’, realized with a M.H pattern in isolation (as /hwæ-t͡sæŋ/ and /kv-t͡seŋ/, respectively), have different underlying tones.

The former has a simple tonal behaviour: its H tone attaches to the last syllable of the lexical word. This is where it appears in all contexts. Under the present analysis, the first syllable of the word receives a M tone by default, yielding a surface-phonological M.H pattern.²

The latter, however, has a H tone that attaches to the last syllable of a unit referred to here as the *morphological nucleus*. Like the floating H tone, this type of H tone only appears when a certain condition is met. For this type of H tone, its appearance is conditioned by whether the last syllable in the morphological nucleus is an appropriate host. When a word carrying this tone is pronounced in isolation, the end of the lexical word is also the end of the morphological nucleus, and the H tone lands there, hence the surface tone sequence M.H: /kv-t͡seŋ/ ‘flea’. When the noun is followed by the copula, the H tone surfaces on it, hence /kv-t͡seŋ niŋ/ ‘is (a/the) flea’. When the noun is followed by the possessive, on the other hand, the H tone does not surface, because this clitic is not an appropriate host (for details, see §xyz of Chapter xyzO3_NounsAndFunctionWords). The result is /kv-t͡seŋ-byŋ/ ‘...of (a/the) flea’, with M tone on both syllables of the noun, and also, by default, on the possessive.

Another nonstandard symbol was devised to transcribe the boundary that is relevant to the attachment of this type of tone: the end of the

² This sequence might also be analyzed as consisting of a MH sequence, associated to the first syllable, and thereby contrasting with the tone category MH#, in which the MH sequence is associated to the last syllable (for example: /hwæ-t͡liŋ/ ‘cat’). There is no evidence that the tone at issue consists of a MH contour, however. The analysis adopted here is therefore as a lexical-word-final H tone, transcribed as H#.

morphological nucleus. Again in an arbitrary way, the dollar sign \$ was chosen to stand for this boundary. (This topic will be taken up in §xyz of Chapter xyzQ, where the discussion will be extended to categories other than nouns.)

To sum up, disyllabic (and polysyllabic) nouns with H tone must be divided into three categories, labelled H\$, H# and #H, depending on how the H tone manifests itself. A H tone on the last syllable of a disyllabic or polysyllabic noun may have different origins. It may be the realization of a High tone that is anchored to the end of the morphological nucleus (a tone transcribed as H\$). Or it may be a High tone anchored to the last syllable of the lexical word: H#. It is impossible to distinguish these in isolation, as both positions coincide. The third of these categories – #H – denotes a noun that carries a floating H tone. In order to find out the underlying tones of words, they have to be heard in various contexts. For nouns, these are: tone-group-final position (as when they are spoken in isolation); tone-group-internal position; and when followed by a toneless clitic such as the possessive. The lexical tone can be arrived at with certainty by matching up the behaviour of the word in these various contexts.

Syllabic anchoring must likewise be specified for L tones; details are provided below, §xyz.

2.3.3. *L tones: existence of a repair phenomenon for all-L tone groups*

‘Sheep’, realized in association with the copula as /joɭ niɭɭ/ (i.e. with a low-rising contour on the verb), is a case where the noun’s phonological tone is hypothesized to surface as such: a L tone. A slight complexity is that the copula surfaces with a low-rising tone. This makes sense in view of the exceptionless observation that an entire utterance cannot carry low tone on all of its syllables. The sequences L+L (monosyllabic noun+copula) and L.L+L (disyllabic noun+copula) cannot surface as such, due to a general prohibition against all-L tone groups in Na. The contour observed at the end of a sequence of L tones is interpreted as resulting from the post-lexical addition of an extra tone. The same applies to the tonal class of disyllables exemplified by /k^hvɭmiɭɭ/ ‘dog’.

Concerning the transcription of low-rising contours, the choice between notation as LM or LH could appear as a nonissue, insofar as there is no contrast (at the surface-phonological level) between LM and LH contours. But in the case of /joɭ niɭɭ/ ‘is (a/the) sheep’ or /k^hvɭmiɭɭ/ (realization of ‘dog’ in isolation), there exists a language-internal argument for analyzing

the endpoint of the contour (a post-lexical tone) as H rather than M: as will be set out in section 2.4.2, the M tone in Na is a phonologically inert tone; if the postlexical tone added to all-L sequences were M, this would be the only instance of rule leading to the association of a M tone to a syllable that is already linked to another tone. The postlexical tone added at the end of a sequence of L tones is therefore analyzed as H, and the rising contour found in ‘dog’, ‘wilderness’, ‘...is a sheep’ will hereafter be written as LH, hence /k^hvɿmiɿ/, /dzuɿnaɿmiɿ/ and /joɿ niɿ/.

2.3.4. *Contour tones: sequences of level tones on the same syllable*

As mentioned in the static overview presented earlier, there are no phonological falling contours in Yongning Na: no syllables carry phonological tones HL, HM, or ML. Also, tone-group-initial H is never observed.

Rising contours, on the other hand, do exist. They are restricted to the last syllable of a tone group: a rising contour is not found on a non-group-final syllable, except in some special cases discussed in §xyz of Chapter xyzSynthesis_AssignmentDomainsAndRules. The two observed contours are M-to-H and L-to-H (the latter constituting the neutralization of LM and LH in the underlying phonological form). Unlike the low-rising contour, discussed in §xyz above, the phonological behaviour of the MH contour is straightforward. When the word is tone-group-final, the contour is realized as such: a rising tone with a non-low starting-point, e.g. in /tɕ^hæɿ/ ‘deer’ and /hwɿliɿ/ ‘cat’. (Note that when a word is pronounced in isolation, it constitutes a tone group on its own: the beginning of the word is also the beginning of the tone group, and the end of the word is also the end of the tone group.) When there is a following syllable within the tone group, the MH contour unfolds, projecting its H part onto that syllable. Unlike the floating High tone (#H), which cannot attach to a following clitic, the MH contour can unfold over any syllable. With the copula, this yields /tɕ^hæɿ niɿ/ ‘is (a/the) deer’ and /hwɿliɿ niɿ/ ‘is (a/the) cat’. With the possessive, this yields /tɕ^hæɿ-bvɿ/ ‘of (a/the) deer’ and /hwɿliɿ-bvɿ/ ‘of (a/the) cat’.

Low-rising contours, on the other hand, raise some rather subtle issues for description and analysis, addressed in the following paragraphs.

Two options for analysis: LM vs. LH, or LM vs. LML?

Concerning the two categories of tones neutralized to a low-rising tone in isolation, illustrated by /zæ/ ‘leopard’ and /bo/ ‘pig’, at least two analytical options are open. Assuming (for reasons which will become clearer below) that the perfective suffix carries a M tone unless affected by what precedes, the realization of ‘...has bought leopards’ as /zæɭ hwæɭ-zeɭ/, with a L tone on the suffix, vs. a M tone for ‘...has bought pigs’ (/boɭ hwæɭ-zeɭ/), could be put down to a floating L tone, parallel to the floating H tone found in the tone categories illustrated by ‘horse’. This tone would remain unassociated when ‘to buy (a/the) panther’ is spoken in isolation, and associate to the suffix when one is available. The tone pattern of ‘to buy (a/the) panther’ would then be LML, as against a more simple LM pattern for ‘to buy a pig’. In turn, the difference between these two object+verb phrases would be put down to a LML vs. LM tone contrast on the noun. The LML sequence could be transcribed as LM+#L: LM followed by a floating L tone.

Another analytical option is suggested by the static observation that a H tone is always followed by L tones within a speech unit – what will be referred to below as a tone group. In this light, the lowering of the tone of the accomplished suffix in /zæɭ hwæɭ-zeɭ/ ‘...has bought leopards’ could be ascribed to the presence of a preceding H tone, which depresses the tones of all the syllables that follow it: the phonological form would be //zæɭ hwæɭ-zeɭ//. In turn, the H tone carried by the verb ‘to buy’ in this construction would originate in a lexical LH tone on the noun ‘leopard’.

Among these two options, the second is currently favoured: floating L tones are not required anywhere else in the description of the language, whereas it seems that there is no avoiding floating H tones in the description. Also, an evolutionary scenario setting out the conditions of appearance of the floating H tone can be proposed (see section xyz), whereas positing a floating L tone would be a flatly synchronic descriptive device. Still, there is no overwhelming evidence for rejecting the analysis of the tone of the ‘leopard’ class as a sequence of three levels: LM, plus a floating L tone (LM+L#). Such cases of analytical indeterminacy are important to understanding the evolutionary potential of the system – a topic which will be taken up in Chapter xyz.

Under the present analysis, the lexical tones //LM// and //LH// contrast not only on monosyllables but also on disyllables. These two tones surface in the same way except when the word is followed by a toneless clitic. For

instance, //boɭmiɬ// ‘sow, female pig’ and //boɭɬaɭ// ‘boar, male pig’ are realized with the same surface-phonological tone pattern, not only in isolation but also when followed by the copula: /boɭ-miɬ niɭ/ ‘...is (a/the) sow’, /boɭ-ɬaɬ niɭ/ ‘...is (a/the) boar’ (these could also be transcribed as /boɭ-miɭ niɭ/ and /boɭ-ɬaɭ niɭ/; there is no contrast at the surface-phonological level). The contexts that can disambiguate their tone pattern are exemplified by /boɭmiɬ-bvɬ/ ‘...of (a/the) sow’ vs. /boɭ-ɬaɬ-bvɬ/ (which could also be transcribed /boɭ-ɬaɭ-bvɬ/) ‘...of (a/the) boar’: in the latter expression, the possessive clitic //bvɬ// receives L tone.

At first, the differences observed across speakers had led to the hypothesis that the word for ‘boar’ may be an exception (Michaud 2008, 191). But the existence of the opposition was later confirmed in the speech of the consultant of reference, F4, in elicited combinations and also in narratives.

For the first category, ‘sow’, the analysis of the tone pattern as LH is ruled out: if one were to transcribe this as /boɭ-miɭ/, then one would have to transcribe the form with the possessive as /*boɭmiɭ-bvɬ/ ‘...of (a/the) sow’, with H+H, a tone sequence which is never observed elsewhere in Yongning Na (Rule (iii): “H is always followed by L”, see §xyz of Chapter xyz). This leads us to propose with full confidence an analysis as LM.

As for ‘boar’, a phonological analysis as /boɭ-ɬaɭ/ makes good phonological sense, insofar as all the tones that follow are lowered to L, as expected following a H tone. When a word of this tonal category is followed by the possessive /bvɬ/, the latter carries L tone; this is the same as after a disyllable with H# tone, as shown in (3) (where the notation as LH for ‘boar’ is adopted):

- (3) a. hwæɬtʂæɭ-bvɬ | ... ‘...of (a/the) rat’
 b. boɭ-ɬaɭ-bvɬ | ... ‘...of (a/the) boar’

In addition, all compounds involving the tone category of ‘boar’ (‘boar’s head’, ‘boar’s blood’...) have the same pattern, which can be described as L+H+a sequence of L tones (L+H+L...). This is again parallel to the H# category, where the tone pattern of all compounds is M+H+a sequence of L tones (M+H+L...).

Under the present analysis, disyllables and monosyllables both undergo a neutralization of the underlying //LM// and //LH// categories when they are realized in isolation. Tone neutralization is a salient aspect of the Yongning Na tone system.

An alternative would be to analyze the tone pattern of ‘sow’ as //LM//, and that of ‘boar’ as //LML//. This analysis equally captures the fact that any following tones are lowered to L: in view of Rule xyz (“All tones following M.L are lowered to L”), LML can only be followed by more L tones. This is the analysis that I chose at first, including in the first version of the Yongning Na glossary deposited in the STEDT project (2011). Describing this tone category as a sequence of three levels did not seem exceedingly complex at the time, in view of the complexity of other categories, such as //L+MH// and //LM+#H//. However, the latter two lexical tone categories are composed of two parts, one associating to the beginning of the word, the other to its end; //LML// would be the only pattern specifying three levels in a row. Moreover, it would be the only category for which a //ML// sequence needed to be posited. Notation as //LH// is therefore adopted here. One may nonetheless keep in mind that an analysis as //LML// would also be possible. Such cases of analytical uncertainty do not merely constitute recondite topics for the phonologist to ponder: they also provide insights into the system’s potential for evolution, since language learners also face these competing analytical options when constructing their own phonological system.

Neutralization of //LM// and //LH// in isolation: is the product LM or LH?

Monosyllables with //LM// and //LH// lexical tones, such as //boɬ// ‘pig’ and //zæɿ// ‘leopard’, are realized in isolation with the same tone: a low-rising contour. Phonetically, a low-to-mid realization and a low-to-high realization are both acceptable. My consultants sometimes corrected my productions of this tone category because the starting-point was not low enough, which obviously entails risks of confusion with //MH//. On the other hand, they never corrected me for a mistaken endpoint (too high or too low).

In an attempt to find out to what extent there is a preference for a phonetically [Mid] or phonetically [High] endpoint for the low-rising contour, I tried fishing for corrections from consultant F4 on several occasions, producing two variants of words such as ‘pig’ and ‘leopard’, both with a low starting-point, one with what I intended as a moderate rise (approximately up to F₀ mid-range), and one which I intended as a strong, rapid rise towards a [High] final target. I asked the consultant to choose

which of the two productions sounded better. The answer was always ‘both are correct’ (/niɪ-bæɪ | hoɪ/: 2-classifier+correct).

The choice made here is to transcribe the product of the neutralization of //LM// and //LH// as /LH/ at the surface-phonological level; but there is no decisive phonetic argument for this notation. The product of tone neutralization tends to be phonetically less definite than the product of consonantal neutralization. For instance, the opposition between coronal and retroflex stops in Yongning Na is neutralized in front of /u/, and the product of neutralization is clearly a retroflex: [tʰu] is a well-formed syllable in Na, and [tʰu] is not. On the other hand, the product of the neutralization of //H// and //M// in isolation occupies the entire portion of the phonetic tone space corresponding to these two tones: it is a non-low tone, and it may not prove appropriate to try to assign it a more precise phonetic label, such as either ‘high’ or ‘mid’.

Two-part tone categories: //LM+#H//, and //LM+MH#//

The H tone in the phrase /naɪhɪɪ niɪ/ ‘...is (a/the) Naxi’ is interpreted as the manifestation of a floating H tone, and the lexical tone of this category analyzed as //LM+#H//: a //LM// sequence plus by a floating H tone, //H//. Likewise, //LM+MH#//, exemplified by //õɪdvɪɪ/ ‘wolf’, is analyzed as a tonal category consisting of two parts: a //LM// tone, plus a final //MH// contour. In both cases, the pound symbol indicates the syllabic anchoring of the second part of these two-part tone categories: after the end of the lexical word for //LM+#H//; and at the end of the lexical word (i.e. on its last syllable) for //LM+MH#//.

2.4. Overview of the system, and some reflections on its structure

2.4.1. Overview of the system

Table 7 sets out the analysis of the six tone categories of monosyllabic nouns and the eleven categories of disyllabic nouns. To date, no single morphosyntactic context bringing out all the tonal contrasts of nouns has been found: each context brings out only some of the oppositions, whereas others are neutralized. For instance, addition of the copula brings out the opposition between //M// and //H// tones (/M+L/ vs. /M+H/ for monosyllables, /M.M+L/ vs. /M.M+H/ for disyllables). This opposition is neutralized to /M/ and /M.M/ respectively in isolation. On the other hand,

addition of the copula neutralizes the tonal contrasts that appear in isolation between //H//, //MH#// and //H\$// on disyllables: all three yield /M.M+H/ with the copula, whereas they are realized as /M.M/, /M.MH/ and /M.H/ respectively in isolation. So it is necessary to elicit a word in several contexts to determine its lexical tone. The table provides information on the tone categories (i) in isolation, (ii) when followed by the copula //ni// (in frame (2): see below), and (iii) when followed by the possessive clitic //bv//.

- (2) $\text{ts}^{\text{h}}\text{w} \mid \mid$ _____ ni
 DEM.PROX target item COP
 ‘This is (a/the) _____.’

This set of three contexts is sufficient to bring out all oppositions, except that between //LM// and //LH// on monosyllables, which only surfaces in a very restricted number of contexts due to the neutralization of //LH// and //LM// sequences at the surface-phonological level. (As was seen above, §2.2.2, one such context is in association with the verb ‘to buy’: for instance, the //LM//-tone word ‘pig’ yields /bo↓ hwæt-ze↓/ ‘...bought pigs’, whereas the //LH//-tone word ‘leopard’ yields /zæ↓ hwæt-ze↓/ ‘...bought leopards’.)

The tone of the proximal demonstrative //ts^hw// in (2) is /M/, regardless of the tonal class of the following item; as a consequence, only the tonal pattern of the rest of the sentence is indicated in Table 7. On the other hand, no tone is indicated for the copula in frame (2), because its surface tone changes according to the tone category of the target word.

Dots indicate boundaries between syllables within the lexical word, and the ‘+’ sign indicates the boundary between the noun and a following morpheme. For instance, the information provided in Table 7 for disyllabic L-tone nouns is: L.LH in isolation, and L.L+H with copula and with possessive clitic. As an example, the word ‘dog’ is /k^hv↓mi↓/ in isolation, yielding /k^hv↓mi↓ ni/ ‘...is (a/the) dog’ and /k^hv↓mi↓-bv/ ‘...of (a/the) dog’. The final H tone in /k^hv↓mi↓/ is due to a general rule, discussed in §xyz2.3.3: tone groups containing only /L/ tones are not allowed by Yongning Na phonotactics; if a tone group only has /L/ tones, a postlexical /H/ tone is added to its last syllable.

The leftmost column in Table 1 (“analysis”) presents the phonological categories. The three following columns contain surface-phonological transcriptions. Examples in the column before last are transcribed

according to the phonological categories, following conventions set out in §2.4.3. The symbols \$ and # are explained below (§xyz2.3.1).

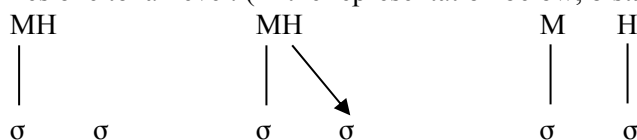
Table 7. The lexical tones of monosyllabic and disyllabic nouns

	analysis	in isolation	+COP	+POSS	example	meaning
Monosyllables	// LM //	LH	L+H	L+H	boɪɪ	pig
	// LH //	LH	L+H	L+H	zæɪɪ	leopard
	// M //	M	M+L	M+M	laɪɪ	tiger
	// L //	M	L+LH	L+M	joɪɪ	sheep
	// #H //	M	M+H	M+M	zɥwæɪɪ	horse
	// MH# //	MH	M+H	M+H	tʃ ^h æɪɪ	deer
Disyllables	// M //	M.M	M.M+L	M.M+M	poɪloɪɪ	ram
	// #H //	M.M	M.M+H	M.M+M	zɥwæɪzo#ɪɪ	colt
	// MH# //	M.MH	M.M+H	M.M+H	hwɥɪliɪɪ	cat
	// H\$ //	M.H	M.M+H	M.M+M	kyɪʃeɪɪ\$	flea
	// H# //	M.H	M.H+L	M.H+L	hwæɪtʃæɪɪ	squirrel
	// L //	L.LH	L.L+H	L.L+H	k ^h vɪmiɪɪ	dog
	// L# //	M.L	M.L+L	M.L+L	daɪjiɪɪ	mule
	//LM+MH#//	L.MH	L.M+H	L.M+H	ɔɪdvɪɪɪ	wolf
	//LM+#H//	L.M	L.M+H	L.M+M	naɪhɪ#ɪɪ	Naxi
	//LM //	L.M	L.M+L	L.M+M	boɪmiɪɪ	sow
	// LH //	L.M	L.M+L	L.M+L	boɪɪaɪɪ	boar

In light of this synthetic view, the distributional observations made above can be flipped around. For instance, instead of stating that “a monosyllabic noun that carries a M tone in isolation may belong in one of three distinct underlying categories”, it can now be said that the three non-contour lexical tones, //M//, //L// and //H//, all neutralize to /M/ when a monosyllable is said in isolation. Among disyllables, //M// and //H// neutralize to /M.M/; //H\$// and //H#// neutralize to /M.H/; and //LM//, //LH// and //LM+#H// neutralize to /L.M/.

When the possessive clitic //byɪɪ// is added after a monosyllabic noun, yielding, for example, /boɪ-byɪɪ/ ‘of the pig’, contours unfold over the two syllables of the resulting combination: //LH// yields /L+H/ (as does //LM//, following neutralizing with //LH//), and //MH// yields /M+H/. The non-contour tones, //M//, //L// and //H//, do not affect the possessive, which surfaces with default /M/.

This last point offers crucial evidence for the distinction between contours (/LM//, /LH// and /MH#/) on the one hand and the floating H tone (/#H/) on the other. The second part of a contour is realized on the possessive; the floating H tone is not. The interpretation proposed is that the possessive clitic cannot provide anchorage for a tone, whereas it can host a tone level that is part of a tone anchored to a preceding syllable. The /MH#// contour tone in Table 7 has a stable phonological anchorage: it is anchored to the syllable preceding the clitic. From there, the second part of the contour can be projected onto the possessive clitic – a process of contour unfolding which is distinct from processes of tonal anchoring. A schematic representation in three stages is presented below: the /MH// tone is lexically associated to a syllable; from there, the H part reassociates to the next syllable, resulting in a situation where each of the two syllables carries one tonal level. (In the representation below, σ stands for a syllable.)



On the other hand, the floating H tone initially lacks anchorage, and the possessive clitic is unable to provide such anchorage. Since this H tone receives syllabic anchorage neither onto the word to which it is lexically attached, nor on the possessive clitic that follows it, it remains unassociated, and does not surface at all.

2.4.2. Analysis of *M* as a default tone

The above analysis assumes that *M* serves as a default tone: syllables that are not specified for tone receive *M*. For instance, a /#H// tone carried by a disyllabic noun can only manifest itself on a following word: the *H* tone, though lexically attached to the noun, never appears on the noun itself. Both syllables of the noun receive /*M*/ tone in the surface-phonological form; under the present analysis, this is understood as default tone assignment. Likewise, /*M.L*/ is observed as a surface pattern on disyllabic and polysyllabic words, such as /da-tji/ 'mule', but this pattern is analyzed as the manifestation of a lexical-word-final *L* tone (notation: /L#//), the /*M*/ tone on the first syllable being a default tone, not a lexically specified tone. Evidence for this analysis will be presented in the course of the

discussion, drawing on the combinatorial properties of tones, such as the tones of compound nouns.

One may be tempted to push this analysis further and try avoiding specifying the M tone anywhere in the model of lexical tones. At present, disyllables such as /da-ŋi/ ‘mule’, with a surface-phonological M.L pattern, are analyzed as having a final L (notation: //L#/), the M tone on the first syllable being a default tone, whereas disyllables such as /boŋmi-/ with surface L.M, are analyzed as having a phonological //LM// tone, i.e. specifying phonologically the M tone of their second syllable. The reason for this analysis is that L tones spread to following syllables; this is referred to in section xyz as rule (xyz): L tone spreads progressively. In Table 7, disyllables that carry L tone on both of their syllables are accordingly analyzed as possessing a simple lexical L tone. In transcriptions, L tone is indicated on both syllables by convention (e.g. the word for ‘dog’, //k^hŋmi//), so as to stay close to surface realizations, but underlyingly, these words are analyzed as carrying a simple //L// tone. Disyllabic nouns that have a /L.M/ pattern (L on first syllable, M on second syllable) are analyzed as having a phonological /M/ on the second syllable, blocking L-tone spreading.

Under an approach dispensing with M at the lexical level, the syllabic anchoring of all L tones would need to be specified. This would to some extent be parallel to H tones, whose modes of association to the syllabic string are indicated with reference to the end of the lexical word, transcribed as #, and of the tone group, transcribed as \$. However, if the L.M pattern were reanalyzed as a word-initial L tone, it would be necessary to specify that it does not spread, unlike other L tones. Reanalyzing the //LM// category as a non-spreading L, contrasting with a spreading L, is a theoretical possibility; but positing two different types of L tones, with different phonological behaviours, is costly in terms of descriptive simplicity and naturalness.

Another alternative would be to analyze the surface /L.H/, /M.L/ and /L.L/ surface patterns as the realization of initial //L//, final //L//, and //L.L// (with L tone specified on both syllables), respectively, avoiding any reference to L-tone spreading. However, L-tone spreading is such a commonly attested process in Yongning Na that this alternative does not appear promising either.

Moreover, another device would be needed in order to describe MH contour tones, since they cannot be described simply as H tones. It would be necessary to posit a separate type of H tones: a contour-creating H tone,

in addition to the three types recognized so far. Finally, M-tone words need to be distinguished from toneless words – words that are altogether devoid of tone, such as the possessive, /bɿ/.

For these various reasons, it seems much preferable to adopt a model using M in the lexical specification of some of the categories.

2.4.3. *The notation of tonal categories in lexical entries*

This section explains the choices made for the notation of tonal categories in lexical entries, as exemplified for nouns in Table 7.

One option would be to indicate the phonological category in superscript at the beginning or end of the word, e.g. //z̥wæ^{#H}// for ‘horse’, and //õ.dv^{LM+MH#}// for ‘wolf’. This notation, which separates tone from vowels and consonants, is unambiguous, and computationally easy to implement. On the other hand, working out the tone-to-syllable mapping requires complete familiarity with the conventional notations; so it appeared better to offer a transcription that looks closer to a surface realization, indicating tones at the end of syllables using International Phonetic Alphabet tone-letters (Chao Yuen-ren 1930): 1 for High, ɿ for Mid, ɹ for Low, ʌ for Low-to-Mid, ʌ for Low-to-High, and ʌ for Mid-to-High. This is strictly equivalent to Africanist notation by means of accents: for instance, //boɿɿ// ‘pig’ could be written as /bõ/ in Africanist notation.

For monosyllables, only one adjustment was made when mapping tonal categories to syllables written in IPA, concerning the H tone. On monosyllables, there exists only one type of H tone: a floating H (notation: #H), that can only surface after the syllable to which it is lexically attached. In the absence of a distinction between various types of H tones, it appeared economical to dispense with the character ‘#’, which indicates the mode of syllabic association, and to write the tone simply as 1. Thus, ‘horse’ is transcribed simply as /z̥wæɿ/, rather than /z̥wæ#ɿ/.

For words of two syllables and more, on the other hand, there are three types of H tones, namely H#, #H and H\$, so an indication about syllabic anchoring cannot be entirely dispensed with. At least two diacritics need to be used to make the three-way distinction among H#, #H and H\$. The first of these three is indicated by a simple H-tone mark 1, as its mode of anchoring appears as phonologically simplest: sitting inert on the last syllable, and never moving from there.

[xxxx to be continued : explain that LM+... is noted as L+... in the IPA notations, etc]

2.4.4. *Attested and unattested lexical tones*

The static regularities brought out in section 2.1 can be reformulated in dynamic terms, as resulting from a set of tone rules. These are discussed in detail in §xyz of Chapter xyz, which also presents the fundamental phonological unit for tonal computation: the tone group. As a preview, the key facts are the following. Within a tone group, contours are only realized as such in tone-group-final position; in non-group-final position, the second level (the H portion in MH, for instance) associates to the following syllable. L tone spreads progressively (left-to-right). All tones following H are lowered to L. Finally, H and M are neutralized to M in tone-group-initial position.

These generalizations, together with the observation that there are no falling contours on a single syllable, rule out all of the nonattested lexical tone patterns for monosyllables, and most of the patterns for disyllables: *H.L, *H.M, *M.LM, *ML.M, and so on. (The star refers to an unattested form, not a proto-form.) On the other hand, there exists a combination that is compatible with the language's phonotactics and yet unattested: there is no //LM+H\$// tone pattern, whereas there exist //LM+MH#// and //LM+#H// patterns. (As for //LM+H#//, it is undistinguishable from //LH//, since for a disyllable both formulas result in the same tonal assignment: L on the first syllable, and a fixed H on the second.) This gap in the system can be interpreted as pointing to a relatively marginal status of //H\$//.

2.4.5. *Reflections on the structure of the system: phonological regularities and morphophonological oddities*

Looking back at the data in Table 7, it is tempting to look for phonological regularities that would account for all the observed data. The search for phonological regularities is soon up against sets of facts that resist phonological generalizations, however. For instance, there is no obvious reason why L should surface as M in isolation. This may have to do with the prohibition of all-L tone groups (see §xyz), and a fortiori all-L utterances; but for verbs this is remedied by adding a post-lexical final H tone, so that verbs with lexical //L// tone surface with a /LH/ contour when they are spoken in isolation. If the tone system were based on a set of phonological rules – rules applying uniformly in all morphosyntactic

contexts –, lexical //L// on a noun would be expected to surface as /LH/, not as /M/. A similarly puzzling case is that of the //L// tone on disyllabic nouns. A word such as //k^hvɿmiɿ// ‘dog’ yields /k^hvɿmiɿ/ in isolation, as expected, but when followed by the copula it yields /k^hvɿmiɿni/ ‘is (a/the) dog’: the copula loses its lexical //L// tone. There is no obvious reason why this should be so: one would have expected a /*L.L.L/ sequence, realized as /*k^hvɿmiɿni/ following the addition of a post-lexical H tone to avoid an all-L phonological word.

This asymmetry in the tonal treatment of the copula after a //L//-tone noun, depending on the number of syllables in the noun, points to a crucial aspect of Yongning Na tone: many tone rules have narrowly restricted fields of application; they apply in highly specific morphosyntactic contexts, and are sensitive to the number of syllables (and internal makeup) of the morphemes at issue.

3. The tones of pronouns

The tonal behaviour of pronouns is not identical with that of nouns, as will be seen throughout the discussion of the language’s morphotonology in subsequent chapters.

3.1. Personal pronouns

xxxx [TO BE ADDED]
xxxx

3.2. Demonstrative pronouns

There exist a proximal and a distal demonstrative, /t͡s^huɿ/ and /t^hvɿ/. The former is more frequent than the latter, and has a grammaticalized use as topic-marker, and another as third-person pronoun – unless the homophony is accidental, but this would be a fairly improbable coincidence. In Naxi, the situation is similar, with the proximal demonstrative, /t͡s^huɿ/, serving as topic-marker; the 3SG morpheme in Naxi is /t^huɿ/, and it is homophonous with the distal demonstrative.

The distal expression /dvɿ-t͡soɿ/ ‘that way, that direction’, now almost fallen into disuse, is structurally parallel to /t͡s^huɿ-t͡soɿ/ ‘this way’ and

/t^hv-tco-/ ‘that way’; one could extract from it a distal demonstrative morpheme, /dv/, even going so far as to propose that its tone was L or LM.

3.3. Locative pronouns

The proximal locative pronoun is /t^hu-qo-/ ‘here’, and the distal locative is /t^hv-qo-/ ‘there’. There also exist extra-distal locative pronouns: /dx-t-qo-/ ‘way over there’, /dx-t^hu-qo-/ ‘way over there’, and /dx-t^hv-qo-/ ‘way over there’, all of them meaning ‘way over there’, and /dx-t^hv-gi#l/ ‘way away in that direction’. Those that include a demonstrative point to a more specific location than /dx-t-qo-/ ‘way over there’, which could be paraphrased as ‘way away; in some faraway place’. There exists a parallel set with /gx-/ as its first syllable, from /gx-/ ‘upward’: /gx-qo-/ ‘way up there’, /gx-t^hu-qo-/ ‘way up there’, and /gx-t^hv-qo-/ ‘way up there’, and /gx-t^hv-gi#l/ ‘way up, in that direction’. These two sets (beginning with /gx-/ and /dx-/) are subject to such heavy intonational modifications that they share essentially identical intonation despite the difference in the lexical tone posited for their first syllable; they are therefore dealt with in Chapter xyzR_IntonationAndPhonetics, section §xyz.

4. The tones of verbs

4.1. Overview

Most verbs are monosyllabic. Seven tonal categories of verbs have been brought out, as shown in Table 8; the subset of intransitive verbs within the M tone category labelled as ‘M_c’ will be discussed further below, §xyz3.2.

The three contexts reported in Table 8 are: (i) in isolation (referred to as ‘citation’ in the table); (ii) with the negation (NEG); and (iii) with /qut-k^hwɔl\$/ ‘a piece’ or /qut-t^hɔl\$/ ‘a drop’ as an object (‘V+a piece’). The two numeral-plus-classifier phrases ‘a piece’ and ‘a drop’ have the same tone: H\$; see Chapter xyz, §xyz for a detailed study of the tones of numeral-plus-classifier phrases.

Table 8. *The lexical tones of verbs.*

tone	citation	example	NEG	example	V+a piece	example
M _a	M	hwæ↓ _a ‘buy’	M.M	mɣ↓-hwæ↓	M.H.L	ɖw↓-k ^h wɣ↓ hwæ↓
M _b		tɕ ^h i↓ _b ‘sell’		mɣ↓-tɕ ^h i↓	M.M.M	ɖw↓-k ^h wɣ↓ tɕ ^h i↓
M _c		bi↓ _c ‘go’		mɣ↓-bi↓	<i>n.a.</i>	<i>n.a.</i>
H		dzu↓ ‘eat’	M.H	mɣ↓-dzu↓	M.M.M	ɖw↓-k ^h wɣ↓ dzu↓
L _a	LH	dze↓ _a ‘cut’	M.L	mɣ↓-dze↓	M.M.H	ɖw↓-k ^h wɣ↓ dze↓
L _b		t ^h u↓ _b ‘drink’		mɣ↓-t ^h u↓	M.M.MH	ɖw↓-t ^h ɣ↓ t ^h u↓
MH	MH	la↓ ‘strike’	M.MH	mɣ↓-la↓	M.H.L	ɖw↓-k ^h wɣ↓ la↓

Realizations in isolation (‘citation forms’) only distinguish three tonal subsets: tone H is realized as M due to the neutralization of H and M in tone-group-initial position (Rule xyz); and the two types of M tones (M_a and M_b) are also realized as M. Tones L_a and L_b are both realized as LH due to the post-lexical addition of a H tone to all-L tone groups (rule xyz). L-tone verbs do not behave like L-tone nouns: the latter surface with M tone in isolation, as mentioned in §xyz. This is one of many examples showing that the tone system of Yongning Na is not based on a small set of phonological rules that apply across-the-board in all contexts, but on morphophonological rules which are specific to certain morphological contexts.

The two other contexts provided in Table 8, the negation and the association with the object ‘a piece’ or ‘a drop’, were chosen because their combinations reveal all six categories, even though each context taken individually only distinguishes four categories. Tones M_a and M_b yield the same tone pattern in association with the negation, as do L_a and L_b, but they are distinguished in the other context; conversely, the tone pairs {M, MH} and {M_b, H} yield the same tone when associated with the object ‘a piece’/‘a drop’ but are distinguished after the negation.

Examples of predicates of the six categories are presented in Table 9.

Table 9. Examples of the six categories of verbs

tone	examples
M _a	hwæ˧˥ _a 'to buy', hō˧˥ _a 'to go away (°imperative)', ki˧˥ _a 'to give', li˧˥ _a 'to watch'
M _b	tɕʰi˧˥ _b 'to sell', ni˧˥ _b 'to need'
H	dzu˧˥ _l 'to eat', ɟi˧˥ _l 'to do', se˧˥ _l 'to walk', tʂʰæ˧˥ _l 'to wash'
L _a	bæ˧˥ _a 'to sweep', dze˧˥ _a 'to cut', ti˧˥ _a 'to hit (gently)', tʰi˧˥ _a 'tired', tɕi˧˥ _a 'to write', tsʰu˧˥ _a 'to arrive', zi˧˥ _a 'to bring', dzi˧˥ _a 'to sit'
L _b	tʰu˧˥ _b 'to drink', zɰɰ˧˥ _b 'to speak'
MH	ɕjɰ˧˥ _l 'to try; to taste', gɰ˧˥ _l 'to carry on one's shoulder', la˧˥ _l 'to strike', tɕɰ˧˥ _l 'to boil', zy˧˥ _l 'to sew (clothes)'

While the data in Table 8 demonstrate the existence of six distinct categories, they leave several analytic possibilities open. The labels used for the pairs of categories {L_a, L_b} and {M_a, M_b} are deliberately abstract, for want of decisive evidence about the phonological nature of the categories at issue is not clear. The letters are assigned on the basis of relative frequency in the lexicon: among L tones, the 'to sweep' type is six times as frequent as the 'to drink' type, and the 'to buy' type twice as frequent as the 'to sell' type.

The 'to sweep' and 'to drink' types, labelled here as L_a and L_b, must both contain a L tone level, since they are realized with L tone after the negation. There is limited evidence on the phonological nature of the difference between the L_a and L_b categories. On the analogy of nouns, one could be analyzed as a simple L tone, and the other as a contour (LM or LH), but this would be arbitrary, since there is no compelling evidence that either of these categories consists in a contour. The apparent economy gained from using labels similar to those of nouns would come together with high costs in terms of descriptive adequacy. The LM and LH contour tones on nouns surface as such in isolation (where they are neutralized to LH), while the L tone on nouns surfaces as M in isolation. There is no such difference between the L_a and L_b categories of verbs, which both surface with a contour (LH) in isolation.

As for the M_a and M_b types, it would likewise be possible to adopt one of the tone categories brought out for nouns, e.g. describing the opposition as one between M and #H, but no evidence has been found to support such identifications, hence the choice to adopt noncommittal (though somewhat cumbersome) abstract labels with subscript letters.

4.2. Tone M_c: a subset of five intransitive verbs within the M tone category

In addition to the six tone categories described above, there is a set of five verbs that behave like M-tone verbs (of the M_a category) except when preceded by the accomplished, /le-/. These are /bi-/ ‘to go’, and its past form /hu-/; /gv-/ ‘to go by, to flow, to fly (of time)’; /ji-/ ‘to come’; and /py-/ ‘to chant, to perform (a sacrifice, a ritual, a festival)’. With the ACCOMPLISHED prefix and the PERFECTIVE suffix, the pattern is M.L.L.: /le-bi-ze/, /le-hu-ze/, /le-gv-ze/, /le-ji-ze/, and /le-py-ze/, whereas the other verbs of the M tone category carry M tone after the ACCOMPLISHED. All five are intransitive verbs, but not all intransitive verbs behave that way, witness ‘to die’: /le-ɣu-ze/ (Sister3.11, 95).

These five verbs could be described as a subset of the M_a category having an exceptional behaviour in association with the ACCOMPLISHED; a further diacritic could be added to their tone label, yielding something such as “M_a’ (M_a prime)”. However, it appears less awkward typographically to label them as M_c, a third subcategory within M tones.

This exceptional behaviour calls for analysis. One hint that may be relevant is that the morpheme /lə-/ in association with these verbs can carry special semantic connotations – a semantic difference that may shed light on their special phonological behaviour. With these verbs, /lə-/ can carry the meaning ‘back/to return’, as in (4) and (5):

- (4) le-bi-ze dzo, | ɬʰwɣ | dɰ-ɰ-ky- tɕw- my-!
 lə bi- dzo ɬʰwɣ dɰ- ɰ- ky- tɕw- my-
 ACCOMP to.go TOP dinner get NEG ABILITIVE REP AFFIRM
 ‘If [the daughter] goes back [to her mother’s home after marriage, she] cannot have dinner there.’ [She must not stay there for the night, she has to go back to her new home before evening.] (Sister3.116)

- (5) ly-ɰi- so-ɬy- pɣ-~pɣ- | le-bi-ze!
 ly-ɰi- so-ɬy- ~ pɣ- lə bi- ze-
 stone a_few ACTIVITY~ carry ACCOMP to_go PFV
 ‘Tonight, I’ll bring (back) a couple of stones! I’m going back!’ (Theft.77; context: a man is compelled by his spouse to go and steal in order to support the family; as he is about to steal sweetcorn, he decides not to steal; instead, he fills his basket with stones and goes back.)

This meaning is not always present, however, and the tone pattern is the same when the meaning is ‘to go, to set off (away from a familiar place and towards an unfamiliar one)’, as in (6).

- (6) “æ.hi.hi!” pi˩, | le˩-bi˩-zo˩-ky˩ | | tsu˩˩ | | -my˩
æ.hi.hi pi˩ lə bi˩ zo˩ ky˩˩ tsu˩ my˩
INTERJECTION say ACCOMP go OBLIGATIVE ABILITIVE REP AFFIRM
‘[The mother, uncles, aunts and other relatives of the deceased wife’s family shout out a cry of defiance:] A-hi-hi! and they set off [towards the husband’s house]!’ (Sister1.81)

Since no principled explanation can be provided for the behaviour of these five verbs after the accomplished, it appeared best to set up a distinct synchronic tone category for them: M_c.

5. The tones of adjectives (stative verbs)

While adjectives behave in most respects like verbs (i.e. as stative verbs), they have some tonal specificities which require the recognition of adjectives as a formally distinct class of words.

Only three main tonal categories were found: L, M, and MH, i.e. no H tone category for adjectives. The L tone category must further be split into two subcategories, as for verbs. The L_b category only contains two examples: /dzɣ˩˩/ ‘good’ and /nɑ˩˩/ ‘black, dark’; details on their behaviour in context is provided in Chapter xyzVerbPhrase.

Importantly, the MH category of adjectives and the MH category of verbs do not always have the same tonal behaviour: examples are provided in Chapter xyzP, §xyz[H-tone suffixes]. Likewise, the L_a and L_b categories of adjectives are not fully parallel to the L_a and L_b categories of verbs in terms of their tonal behaviour. As for the M category of adjectives, no evidence was found for a division of the M tone into subcategories corresponding to the M_a, M_b and M_c categories set up for verbs. These differences between the tone system of adjectives and that of verbs exemplifies the morphosyntactic ramifications of tone in Yongning Na.

In view of the range of tone categories found on nouns, verbs and adjectives in Yongning Na, it is no wonder that they yield a wealth of diverse patterns when combined among themselves, and combined with

grammatical morphemes. The following chapters investigate these combinatorial properties.

6. Summary

The tones of Yongning Na are phonetically simple. The tone-bearing unit is the syllable – more specifically the syllable rhyme. There is no distinction in terms of syllable weight, and thus no need for a decomposition into moras: any syllable rhyme, including syllabic consonants, can function as a tone-bearing unit for one or two tonal levels.

There are three level tones, H(igh), M(id) and L(ow). Out of six theoretically possible contours (HM, HL, MH, ML, LH, and LM), only three are attested as lexical categories: MH, LH and LM, e.g. /tʂ^hæɿ/ ‘deer’, /zæɿ/ ‘leopard’, and /boɿ/ ‘pig’. Moreover, at the surface-phonological level (that of entire utterances), (i) contours are restricted to tone-group-final position, and (ii) LM and LH are neutralized to LH.

Said differently, each syllable within a tone group carries one of three levels: H, M or L, and the last syllable can carry one of the following: H, M, L, MH, or LH. There are no phonological falling contours on a single syllable: *HL, *HM or *ML, only rising contours.

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Chapter 4

The noun phrase, Part I: Compound nouns

1. The noun phrase in Na: a general introduction

Tonal processes applying within the noun phrase constitute a major part of the Yongning Na tone system. They also shed light on evolutionary processes. In Na, as in other Sino-Tibetan languages that have undergone considerable phonological erosion (such as Tujia, Bai, Namuyi, or Shixing), many roots that used to be phonologically distinct have become homophonous; as a consequence, there exists a strong tendency towards disyllabification. The study of synchronic tonal processes brings out which processes – such as compounding and affixation – feed into which categories of disyllabic nouns. It also brings out, by contrast, those disyllabic nouns whose tones are not those that one would expect in view of currently productive rules. In turn, this draws attention to these outlier nouns, raising the issue of where they got their tone from – whether they date back to a time when different tone rules applied, for instance.

Tonal phenomena taking place within the noun phrase in Na will be presented in the following order: compounds (this chapter); numeral-plus-classifier phrases (Chapter xyz); and combinations between nouns and grammatical morphemes (Chapter xyz). As explained in the following paragraph, the discussion leaves aside combinations that do not involve tone change, such as those between nouns and adjectives.

1.1. Adjectives seldom interact tonally with nouns

1.1.1. The most common case: *N+Adj+RELATIVIZER/NOMINALIZER*

Adjectives in Na can be considered as stative verb predicates (Lidz 2010, 362). Adjectives are associated to nouns through the construction *N+Adj+RELATIVIZER/NOMINALIZER* /hĩ/: /ʂuɪɫ/ ‘new’ yields /ʂuɪɫ-hĩɫ/ ‘(which is) new’, added after the noun as a separate tone group, as in /p^{hi}ɪɫ | ʂuɪɫ-hĩ#ɫ/ ‘brand new linen cloth’, /tɕ^hoɪɫ | ʂuɪɫ-hĩ#ɫ/ ‘new ladle’, and

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/q^hwɣɿŋ | ʃuɿ-ɿhĩ#ŋ/ ‘new bowl’. In this case, which is the most common, no tonal interaction takes place between the noun and adjective.

1.1.2. Lexicalized cases: N+Adj

Noun phrases that contain a noun and an adjective are in fact lexicalized nouns. For instance, /əɿmiɿ-dɿuɿ/ and /əɿmiɿ-tɕiɿ/, referring to the mother’s older sisters and younger sisters respectively, are lexical units, even though they can still be transparently analyzed as made up of /əɿmiɿ/ ‘mother’ plus the adjectives /dɿuɿ/ ‘large’ and /tɕiɿ/ ‘small’. The conceptual difference between mother’s older sisters and younger sisters is strong in Na culture, witness the existence of distinct terms of address: /əɿjɣɿ/ for ‘mother’s older sister’ and /əɿtɕiɿ/ for ‘mother’s younger sister’.

By contrast, there is one single term of address for maternal uncles: /əɿvɿŋ/. To specify whether one is referring to the mother’s older brother or younger brother, an adjective is added: ‘mother’s elder brother’ is /əɿvɿŋ | dɿuɿ-hĩŋ/, and ‘mother’s younger brother’ is /əɿvɿŋ | tɕiɿ-hĩŋ/, with the RELATIVIZER/NOMINALIZER. (Some examples of both are found in Caravans.75, 76, 78, 79, 177-179, 196, 259 and Elders3.23, 31, 32.)

The study of successive occurrences within the same text confirms that the construction with the RELATIVIZER/NOMINALIZER /hĩ/, although it may seem cumbersome, is the standard construction to associate an adjective to a noun. This construction is not followed by a synthetic, compact N+ADJ construction at later occurrences. For instance, a text explains: ‘It is said that [this couple] had a big girl, a big child (=a child who thought very seriously for her age)’, /mɿɿzoŋ | dɿuɿ-hĩŋ, | zoɿmɿɿ | dɿuɿ-hĩŋ | dɿuɿ-ɿuɿ dzoŋ-tsuɿ/ (Reward.59). The same phrasing, with the RELATIVIZER/NOMINALIZER /hĩ/, appears again soon afterwards: /mɿɿzoŋ | dɿuɿ-hĩŋ-kiŋ/ ‘to his elder daughter, [the father said...]’ (Reward.65).

This is a notable difference from Naxi. For instance, ‘important person, great personage; adult’ in Naxi is /hiɿ-dɿuɿ/ ‘person’+‘big’. This appears in the text Weresow: /hiɿ-dɿuɿ wɿ jɿŋ, dɿuɿ-məɿ tɕ^huɿ-beɿ kəɿ leɿŋ-tɕ^huɿ/ ‘being an important person, [the to-mba priest] left [the place where he had conducted a ritual] rather early’. In Na, the same concept is : /dɿuɿ-hĩŋ/, ‘big’+REL, with ‘person’ as the implicit referent (e.g. Sister.13, 14, 34; Sister3.31, 36, 38, 41; and BuriedAlive3.5).

1.1.3. Intermediate cases: items currently in the process of lexicalization

There exist intermediate cases between the two extremes presented above – lexical items such as /ə́tmiɬ-dɯ́/ ‘mother’s elder sister’, and adjectival constructions such as /ə́tɬɬ | dɯ́-hĩ́/ ‘mother’s elder brother’. ‘Elderly person’ is /hĩ́-mo/́/, from /hĩ́/ ‘person’ and /mo/́/ ‘old’. In a set of 20 texts, this noun appears 15 times, always in the plural, as /hĩ́-mo/́=ɬǽ/; the fact that it is followed by a clitic shows that it is a full-fledged noun. But there is a higher number (23) of occurrences of /hĩ́ mo/́-hĩ́/, again from /hĩ́/ ‘person’ and /mo/́/ ‘old’, but with addition of the relativizer /hĩ́/. This is not quite like the adjectival construction presented above: in that constructions, the noun constitutes a tone group on its own, e.g. /tɕʰoɬ | ʂuɬ-hĩ́#/ ‘new ladle’, whereas one says /hĩ́ mo/́-hĩ́/. At a push, it would be possible to say /hĩ́ | mo/́-hĩ́/ ‘a person that is old’, but it would be decidedly awkward in the attested contexts where /hĩ́ mo/́-hĩ́/ is found. The interpretation that can be proposed is that /hĩ́-mo/́/ is on its way towards lexicalization, witness the tonal interaction between its two constituting morphemes, but the perception of its second syllable as an adjective remains strong enough for the relativizer to be commonly added after it. The impossibility of adding the agent suffix (/ʰhĩ́-mo/́-ŋɯ́/) or the topic-marker (/ʰhĩ́-mo/́-tɕʰuɬ/) shows that /hĩ́-mo/́/ is not fully lexicalized yet; it is indispensable to add an intervening plural or relativizer: /hĩ́-mo/́=ɬǽ-ŋɯ́/, /hĩ́-mo/́=ɬǽ-tɕʰuɬ/, /hĩ́ mo/́-hĩ́-ŋɯ́/, and /hĩ́ mo/́-hĩ́-tɕʰuɬ/.

For purposes of synchronic description, the notations adopted are /hĩ́-mo/́=ɬǽ/, where /hĩ́-mo/́/ is treated as a lexical unit, with no hyphen or blank space between its two syllables, and /hĩ́ mo/́-hĩ́/, where the first syllable is analyzed as a noun, and separated by a blank space from the adjective that follows. This notational difference may appear to overemphasize the difference between the two expressions; this difference appears important enough for two distinct notations to be adopted, however.

This tonal ambivalence partakes in a more general versatility of disyllables made up of a noun and an adjective. For instance, /zoɬbǽ/, from /zo/́/ ‘son; man’ and /bǽ/ ‘stupid; dumb’, has clearly nominal uses, meaning ‘dumb man; stupid man’; more than twenty examples are found in the Lake narrative, one of whose main protagonists is a dumb person. The noun can be followed by the agent suffix: /zoɬbǽ-ŋɯ́/ (Lake3.29, Lake4.24); there is no need for an intervening relativizer/nominalizer for quantization purposes: /zoɬbǽ dɯ́-ɣ́/ ‘a dumb person’ (Lake4.4),

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/zoɫbæɫ tʂʰuɫ-ɣɫ/ ‘this dumb person’ (Lake4.6), /zoɫbæɫ tʰɣɫ-ɣɫ/ ‘that dumb person’ (Lake4.12-14); and it can also appear right in front of a verb: /zoɫbæɫ | goɫboɫ diɫɫ/ ‘the dumb man drove cattle’. But the word also has adjectival uses: in a context of self-deprecation where someone accuses himself of being stupid, /zoɫbæɫ/, another person may comfort him by saying: /məɫ-zoɫbæɫ/ ‘[No, you are] not stupid!’

The antonym of /zoɫbæɫ/ in this adjectival sense is /zoɫtʰiɫ/ ‘clever; clever person’, which has the same structure, from /zoɫ/ ‘son; man’ and /tʰiɫ/ ‘able; capable; competent; clever’. The two words have different tones – tone L# for /zoɫbæɫ/, tone M for /zoɫtʰiɫ/ – despite their constituting morphemes having the same tones. This tonal difference alerts us to the fact that the two words may have different time depths. Syntactically, the two words also differ: it is not possible to say /*məɫ-zoɫtʰiɫ/ ‘not clever’, on the analogy of /məɫ-zoɫbæɫ/ ‘not stupid’. The first syllable of these two words is bleached enough for them to be used as adjectives for men and women alike, but in their nominal use they can only refer to men: /zoɫbæɫ/ means ‘stupid man’, and /zoɫtʰiɫ/ ‘clever man’; the corresponding words for women are /mvɫ-bæɫmiɫ/ and /mvɫtʰiɫ/.

1.2. Possessive constructions and compounds

In Yongning Na, no tonal change takes place in possessive constructions, whereas tonal changes take place in compounds. In possessive constructions, the possessive /by/ is added after the determiner, before the head, e.g. /hwɫliɫɫ/ ‘cat’, /ɬɣɫɫ/ ‘brains’, /hwɫliɫ-bɣɫɫ | ɬɣɫɫ/ ‘brains of the cat’. The first noun – the determiner – and the possessive particle form a single tone group, whose tone pattern is determined as described in Tables xyz1 and xyz2 in Chapter xyzN. As for the second noun – the head –, its tone pattern remains the same as in isolation. Pronouns constitute a separate set in this respect; possessive constructions involving pronouns will be presented in §xyz of Chapter xyzNounPlusFunctionWord.

The study of compounds is known to be highly revealing of prosodic systems. In Yongning Na, determinative compounds, such as ‘tiger’s skin’, and coordinative compounds, such as ‘mother and daughter’, do not follow the same tone rules. For instance, the determinative compound ‘nanny goat’s back’, /tsʰuɫmiɫ-gvɫdvɫ/, carries tone H# (a final H tone), whereas the coordinative compound ‘father and mother’, /əɫdaɫ-əɫmiɫ#ɫ/, carries tone #H (a floating H tone), even though the input tones are the same: both ‘nanny goat’ and ‘father’ have tone H\$; and both ‘mother’ and ‘back’ have

tone M. Determinative compounds and coordinative compounds are therefore presented separately in the next two sections.

2. Determinative compound nouns

Compounding is a highly productive word formation process in Na, as in many other languages of East and Southeast Asia (on Sinitic: Arcodia 2012, *passim*). Determinative compounds are more common than coordinative compounds.

In determinative compounds, the order of constituents is determiner plus head, as is generally the case in Sino-Tibetan (Michailovsky 2011). The tones of compounds are not simply the concatenation of those of their constituents. The present analysis progresses in increasing order of abstraction, from the surface-phonological patterns of compounds towards an analysis of the underlying system.

2.1. The role of the number of syllables

Tonal changes in compounding are only observed when the second term – the head – is less than three syllables in length, i.e. in combinations of the form $\sigma + \sigma$, $\sigma + \sigma\sigma$, $\sigma\sigma + \sigma$, $\sigma\sigma + \sigma\sigma$, $\sigma\sigma\sigma + \sigma$, or $\sigma\sigma\sigma + \sigma\sigma$. Otherwise no tone change takes place. What matters is thus not the total number of syllables of the resulting compound, but the number of syllables of the head. Examples (1a-c) constitute an illustration.

- (1) a. $lo\text{-}ʃv\text{J} \mid -hi\text{J}na\text{-}mi\#ʔ$
 ‘Lugu lake’
 b. $ʃi\text{-}di\text{J} - di\text{J}mi\text{J}$
 ‘Yongning plain’
 c. $gi\text{-}na\text{-}mi\text{-}nj\chi\text{J} \text{J}u\text{J}$
 ‘bear’s eye’

The place names in (1a-b) have the same syntactic structure: $/lo\text{-}ʃv\text{J}/$ (Chinese: 落水 *Luòshuǐ*) is the name of a village on the shore of Lugu lake, and $/ʃi\text{-}di\text{J}/$, literally ‘the central place’, is the name of Yongning. The relationship in both cases is between determiner and head: ‘the lake of $/lo\text{-}ʃv\text{J}/$ ’, ‘the plain of $/ʃi\text{-}di\text{J}/$ ’. In (1a), both parts of the compound retain their lexical tones: $/lo\text{-}ʃv\text{J}/$ ‘Luoshui’, and $/hi\text{J}na\text{-}mi\#ʔ/$ ‘lake’. The phrase

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‘Lugu lake’, /lo-ɬɿvɪl -hiɪna-ɬmi#ɪ/, must be analyzed as consisting of two tone groups; if it constituted a single tone group, its tone pattern would be /*lo-ɬɿvɪl-hiɪnaɪmiɪ/, by application of Rule 5: “All syllables following a HL or ML sequence receive L tone”. (For a recapitulation of the rules applying within the tone group, see §xyz of Chapter xyzQ.) In (1b), the expected tone change takes place, by application of Rule 5: the lexical tone of ‘plain’ is M (/di-ɬmi-ɪ/); in the compound, this word is lowered to L. Example (1c), from /gi-ɬna-ɬmi#ɪ/ ‘bear’, and /njɛɪɪɪɪ/ ‘eye’, illustrates the fact that tonal change takes place in compounds with a three-syllable determiner, provided that the head comprises no more than two syllables.

To venture an intuitive comment, it is clear from the data set out below (Table 4 and following tables) that heads undergo more tonal changes than determiners in compounding: in particular, there are numerous cases where a H tone that originates lexically on the determiner moves all the way to the last syllable of the head. Viewed in this light, tonal computation over $\sigma\sigma\sigma + \sigma\sigma$ sequences can be considered as slightly less complex than they would be over $\sigma\sigma + \sigma\sigma\sigma$ sequences. This difference in complexity sheds some light on the asymmetrical state of affairs whereby $\sigma\sigma\sigma + \sigma\sigma$ compounds undergo tonal change, and not $\sigma\sigma + \sigma\sigma\sigma$ compounds.

2.2. How the tone patterns were collected

Some lexicalized compounds are found in the glossary compiled in the course of fieldwork; others can be found in narratives. In order to obtain all possible tonal combinations of determiner and head, systematic elicitation was also used. The main language consultant, F4, was extremely reluctant to accept semantically implausible combinations. She gradually understood that the unusual combinations that I put forward were designed to obtain a particular sequence of tones; she nonetheless retained a strong commitment to a common-sense use of language, standing on the firm ground of common usage. In the consultant’s view, compounds such as ‘flea’s back’ and ‘flea’s liver’ did not stretch plausibility too far, and I gratefully recorded them. But she would definitely not accept combinations such as ‘chief’s beetle’s kidney basket’ (to cite an example used by Hyman 2007, taken up in Evans 2010: 225). It was nonetheless possible to obtain all combinations in the end, searching through the word list to arrive at the least implausible combinations, and discussing possible contexts with the consultant. This made the elicitation process slower than with a consultant who readily accepts to create any combination. A consultant’s conservative

behaviour may have some advantages, however: while I have no reason to doubt the validity of results obtained through highly artificial combinations, some might have suspicions that a consultant whose imagination runs free from the trammels of common sense could occasionally take similar liberties with the language's ordinary rules.

Relatively extensive recordings of compounds are available online from the Pangloss archive, containing over 1,500 compounds (recordings: Tone1-15, and TonePeoples). Some examples are also found in texts, e.g. /əɫmiɫ-ɛæɫvɫ/ 'mother's neck' in Tiger2.xyz; in all cases, the tone patterns are identical with those obtained through systematic elicitation. Table 1 provides one example word for each tonal category of noun used to build compounds referring to body parts of animals.

Table 1. Example words used to elicit body-part compound nouns.

tone	determiners	meaning	heads	meaning
LM	boɫɫ	pig	ɣuɫɫ	skin
M	laɫ	tiger	bvɫ	intestine
L	joɫ	sheep	mɻɫ	fat
#H	zɯwæɫ	horse	sɻɫ	blood
MH#	tʂʰæɫɫ	deer	ɬvɫɫ	brains
M	poɫloɫ	ram	gvɫdvɫ	back
#H	zɯwæɫzo#ɫ	colt	ɲiɫgɻ#ɫ	nose, snout
MH#	hwɻɫliɫɫ	cat	qvɫtʂæɫɫ	voice
H\$	hwɻɫmiɫ\$	she-cat	hoɫmiɫ\$	stomach
L	kʰvɫmiɫ	dog	nvɫmiɫ	heart
L#	daɫjiɫ	mule	ɬiɫpiɫ	ear
LM+MH#	õɫdvɫɫ	wolf	jiɫtʂæɫɫ	waist
LM+#H	naɫhĩ#ɫ	Naxi person	ɲjæɫqʰæ#ɫ	gum in the eyes
LM	æɫmiɫ	hen	ɲjɻɫɫuɫ	eye
LH	boɫɫaɫ	boar	hiɫzæɫ	uvula
H#	hwæɫtsuɫɫ	rat	ɛæɫɫvɫ	neck

2.3. The facts

2.3.1. Surface-phonological tone patterns

The tone patterns of compound nouns in Yongning Na are set out in Table 2 as a function of the tones of their constituting elements. Each line of the

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table corresponds to one determiner and each column to a head. Part a of the table presents monosyllabic heads, and part b disyllabic heads.

Like simple nouns, compounds must be elicited in at least two contexts to bring out their tone category. The data were therefore elicited not only in isolation but also in the carrier sentence /tɕʰu˥˥ | __ ni˨˩/, ‘This is...’. This distinguishes tone categories M and #H. For these categories, the tonal string that obtains when adding the copula is indicated after a comma. For instance, the information ‘M.L’ at the intersection of line M and column LM indicates that the tone of the compound at issue is M.L, e.g. /la˥˥-yɯ˨˩/ ‘tiger’s skin’. The fact that one single pattern is provided means that this pattern is unchanged when a copula is added, the copula bearing its lexical L tone: /la˥˥-yɯ˨˩ ni˨˩/ ‘...is tiger’s skin’. The information ‘M.M, M.M.H’ at the intersection of line M and column M indicates that the tonal string of the compound at issue is M.M when said in isolation, e.g. /la˥˥-bv˨˩/ ‘tiger’s intestine’, and that addition of a copula yields a M.M.H pattern: /la˥˥-bv˨˩ ni˨˩/ ‘...is tiger’s intestine’. In view of the tone in isolation, M.M ([la˥˥-bv˨˩]), the underlying tone could be a M tone or a #H tone (a H tone that is floating, and can only be realized after the lexical item at issue). The fact that the copula receives a H tone when it follows this compound ([la˥˥-bv˨˩ ni˨˩]) reveals that the underlying tone pattern is #H.

When there exist tonal variants, alternatives are separated by slashes. For instance, the indication ‘M.L.L/M.M.H’ in line #H, column H\$ of Table 2b (top part of table: monosyllables) means that these compounds can have either of two patterns: M.L.L or M.M.H, e.g. /zɯwæ˥˥-ho˥˥mi˨˩/ or /zɯwæ˥˥-ho˥˥mi˨˩/ for ‘horse’s stomach’. Adjacent cells with identical patterns have been fused. Finally, for the sake of typographical economy, sequences of four M tones (M.M.M.M) have been abbreviated to ‘M...M’.

In view of the rarity of three-syllable nouns, one single three-syllable determiner was used: /gi˥˥-na˥˥mi˨˩/ ‘bear’ (tone: #H). The data are set out in Part 3 of the table.

Table 2. Surface-phonological representation of the tone patterns of compound nouns. Part a: monosyllabic head.

	tone	LH; LM	M	L	H	MH
monosyllables	LM	L.M	L.M	L.M	L.M, L.M.H	L.MH
	LH	L.H	L.L	L.H		
	M	M.L	M.M, M.M.H	M.L	M.M, M.M.H	M.MH
	L	L.LH				
	H	M.H	M.M, M.M.H			M.L
	MH	M.H			M.H, M.M.H	
disyllables	M	M.M.L	M.M.M, M.M.M.H	M.M.L	M.M.M, M.M.M.H	M.M.L
	#H	M.M.H	M.M.M, M.M.M.H			M.M.L
	MH#	M.M.H	M.M.MH			M.M.H
	H\$	M.M.H	M.M.M, M.M.M.H	M.M.H, M.M.M.H	M.M.M, M.M.M.H	M.H.L
	L	L.L.H	L.L.LH			L.L.H
	L#	M.L.L				
	LM+M	L.M.H	L.M.MH	L.M.H, L.M.M.H		
	H#					
	LM+#	L.M.H	L.M.M, L.M.M.H	L.M.H	L.M.M, L.M.M.H	L.M.H
	H					
	LM	L.M.L	L.M.M	L.M.L	L.M.M, L.M.M.H	L.M.MH
LH	L.H.L					
H#	M.H.L					

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Part b. Disyllabic head. Top: monosyllabic determiner; bottom: disyllabic determiner.

tone	M	#H	MH#	H\$	L	L#	LM+MH#; LM+#H; LM; LH	H#
LM, LH	L.M.M	L.M.M, L.M.M.H	L.M.MH/ L.H.L	L.M.H, L.M.M.H	L.M.L	L.M.L/ L.L.H	L.H.L (=L.M.L)	L.M.H/ L.L.H
M	M.M.M	M.M.M, M.M.M.H	M.M.MH	M.M.H, M.M.M.H	M.L.L	M.M.L	M.L.L	M.M.H
L	L.L.LH			L.L.H	L.L.LH	L.L.H	L.H.L	L.L.H
#H	M.M.H	M.M.M, M.M.M.H	M.H.L	M.L.L /M.M.H	M.H.L	M.M.H	M.H.L	M.M.H
MH#	M.M.H	M.M.M, M.M.M.H	M.M.MH	M.H.L	M.H.L	M.M.H	M.H.L	M.M.H

tone	M	#H	MH#	H\$	L	L#	LM+MH#; LM+#H;LM; LH	H#
M	M.M	M.M, M.M.H	M.MH	MMM.H, M.M.H /MM.H.L	M.M.L.L	M.M.M.L	M.M.L.L	M.M.M.H
#H	MMM.H	M.M, M.M.H	M.M.H.L	MMM.H, M.M.H /MM.H.L /MMM.H	M.M.H.L	M.M.M.H	M.M.H.L	M.M.M.H
MH#		M.M.H	M.M.H.L	M.M.H.L /MMM.H	M.M.H.L	M.M.M.H	M.M.H.L	M.M.M.H
H\$		M.M, M.M.H	M.M.H.L /M.H.L.L		M.M.H.L	M.M.M.H	M.M.H.L	M.M.M.H
L	L.L.L.H	L.L.L.L.H	L.L.H.L	L.L.L.H	L.L.H.L	L.L.L.H	L.L.H.L	L.L.L.H
L#	M.L.L.L	M.L.L.L						
L+ MH#	L.M.M.H	L.M.M.M, L.M.M.M. H	L.M.H.L			L.M.M.H	L.M.H.L	L.M.M.H
LM+ #H			L.M.H.L	L.M.M.H, L.M.M.M.H	L.M.H.L			
LM	L.M.M.M		L.M.M.M H		L.M.L.L	L.M.M.L	L.M.L.L	
LH	L.H.L.L							
H#	M.H.L.L							

Part c. Compounds with a trisyllabic, #H-tone determiner: ‘bear’+body part

head		compound	
form	tone	surface form	surface tone
uɿɿ ‘skin’	LM	gi-naɿmiɿ-yuɿ	M.M.M.H, M.M.M.H.L
byɿ ‘intestine’	M	gi-naɿmiɿ-byɿ	M.M.M.M, M...M.H
mɿɿ ‘grease’	L	gi-naɿmiɿ-mɿɿ	M.M.M.MH
sɿɿ ‘blood’	H	gi-naɿmiɿ-sɿɿ	M.M.M.M, M...M.H
ɬvɿɿ ‘brains’	MH	gi-naɿmiɿ-ɬvɿɿ	M.M.M.L
gvɿdvɿ ‘back’	M	gi-naɿmiɿ-gvɿdvɿ	M.M.M.M.M, M...M.H
niɿgɿɿ ‘nose’	#H	gi-naɿmiɿ-niɿgɿɿ	M.M.M.M.M, M...M.H
qvɿɬsæɿ ‘throat’	MH#	gi-naɿmiɿ-qvɿɬsæɿ	M.M.M.H.L
hoɿmiɿ\$ ‘stomach’	H\$	gi-naɿmiɿ-hoɿmiɿ	M.M.M.M.H, M...M.H
nvɿmiɿ ‘heart’	L	gi-naɿmiɿ-nvɿmiɿ	M.M.M.H.L
ɬiɿpiɿ ‘ear’	L#	gi-naɿmiɿ-ɬiɿpiɿ	M.M.M.M.H
jiɿɬsæɿ ‘waist’	LM+MH#	gi-naɿmiɿ-jiɿɬsæɿ	M.M.M.H.L
njɿɿɿ ‘eye’	LM	gi-naɿmiɿ-njɿɿɿ	M.M.M.H.L
ɬæɿɿvɿ ‘neck’	H#	gi-naɿmiɿ-ɬæɿɿvɿ	M.M.M.M.H

2.3.2. Analysis into underlying tone patterns

The tonal strings reported in Table 2 can be analyzed into abstract patterns. For instance, the sequence L.LH can be interpreted as the realization of a simple L tone: it spreads over the two syllables of the compound, yielding L.L; and this sequence is further supplemented by a postlexical H tone due to Rule 7 (“If a tone group only contains L tones, a post-lexical H tone is added to its last syllable”). The result of analysis is presented in Table 3, which contains all the information required to generate the patterns of compounds, following the association rules provided in section xyz.

In the description of these patterns, reference must be made to a juncture that is internal to the tone group: one that separates the determiner from the head. This juncture is indicated by the symbol °.

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Table 3. Abstract representation of the tone patterns of compound nouns. Part a: monosyllabic head.

	tone	LM; LH	M	L	#H	MH
monosyllables	LM; LH	LH	LM	LH	LM+#H	LM+MH#
	M	°L	#H	°L	#H	MH#
	L	L				
	H	#H°	#H			°L
	MH	H#			H\$	
disyllables	M	°L	#H	°L	#H	°L
	#H	#H°	#H			
	MH#	H#	MH#			H#
	H\$	#H°	#H	H\$	#H	H#°
	L	L+H#	L			L+H#
	L#	L#°				
	LM+ MH#	LM+ MH#°	LM+MH#	LM+H\$		
	LM+# H		LM+#H	LM+H#	LM+#H	LM+H#
	LM					LM°L
	LH	LH				
	H#	H#°				

Part b: disyllabic head. Top: monosyllabic determiner; bottom: disyllabic determiner.

tone	M	#H	MH#	H\$	L	L#	LM+MH#; LM+#H; LM; LH	H#
LM; LH	LM	LM+# H	LM+ MH#/ L+#H°	LM+H\$	L+#H°	L+#H° / L+H#	L+#H°	LM +H# / L+H#
M	M	#H	MH#	H\$	°L	°L#	°L	H#
L	L			L+H#	L	L+H#	L+#H°	L+H#
#H	H#	#H	#H°	°L / H#	#H°	H#	#H°	H#
MH			MH#	#H°				#H

tone	M	#H	MH#	H\$	L	L#	LM+MH#; LM+#H; LM; LH	H#
M	M	#H	MH#	H\$ / #H°	°L	°L#	°L	H#
#H	H#		#H°	H\$ / #H° / H#	#H°	H#	#H°	
MH#			MH#	#H° / H#			MH#°	
H\$			#H	#H° / H#°	#H°		#H°	
L	L+H#	L	L+H#	L+H#	L+#H°	L+H#	L+#H°	L+H#
L#	L#°							
LM + MH#	LM +H#	LM +H	LM+M H#°	LM +MH#°/ H#	LM +MH#°	LM +H#	LM +MH#°	LM +H#
LM +H				LM°H\$	LM+ #H°			
LM	LM°		LM+M H#		LM°L	LM°L#	LM°L	
LH	LH							
H#	H#°							

Part c. Compounds with a trisyllabic, #H-tone determiner: 'bear'+body part

head		compound	
form	tone	underlying form	underlying tone
uɬ 'skin'	LM	gi-na-tmi-t-yuɬ	H#
byɬ 'intestine'	M	gi-na-tmi-t-bvɬ	#H
mɣɬ 'grease'	L	gi-na-tmi-t-mɣɬ	MH#
sɣɬ 'blood'	H	gi-na-tmi-t-sɣɬ	#H
ɬvɬ 'brains'	MH	gi-na-tmi-t-ɬvɬ	L#
gvɬdvɬ 'back'	M	gi-na-tmi-t-gvɬdvɬ	#H
ni-tgɣɬ 'nose'	#H	gi-na-tmi-t-ni-tgɣɬ	#H
qvɬʈsæɬ 'throat'	MH#	gi-na-tmi-t-qvɬʈsæɬ	#H°
ho-tmiɬ\$ 'stomach'	H\$	gi-na-tmi-t-ho-tmiɬ\$	H\$
nvɬmiɬ 'heart'	L	gi-na-tmi-t-nvɬmiɬ	#H°
ɬi-tpiɬ 'ear'	L#	gi-na-tmi-t-ɬi-tpiɬ	H#
jiɬʈsæɬ 'waist'	LM+MH#	gi-na-tmi-t-jiɬʈsæɬ	#H°
njɣɬɬuɬ 'eye'	LM	gi-na-tmi-t-njɣɬɬuɬ	#H°
ɬæ-tɣɬ 'neck'	H#	gi-na-tmi-t-ɬæ-tɣɬ	H#

Four tonal classes of head nouns always behave in the same way: the opposition between LM, LH, LM+#H and LM+MH# is neutralized. These tone categories for heads are therefore pooled together in the above tables. Among determiners, the opposition between LH and LM on monosyllables is neutralized; accordingly, these two tones are also pooled together in the tables.

2.4. Data analysis

A few of the combinations in Table 3 appear counter-intuitive in terms of the input tones. For instance, a M-tone determiner plus a M-tone monosyllabic head combine to a H-tone compound; specifically, a compound with a floating H tone, #H. This result could go so far as to cast doubt on the correctness of the analysis of the tone category of the two members of the compound as M, since this tone is expected to be inactive (see §xyz of Chapter N). However, while a disyllabic determiner with M tone and a monosyllabic head with M tone likewise yield a compound with #H tone, a compound made of a M-tone determiner and a M-tone disyllabic head carries a simple M tone. The analysis of the lexical category as M does not appear mistaken: the unexpected #H output is not the result of a general phonological rule of Na whereby any combination of two M tones would produce a floating H; it results from a morphophonological rule that is specific to this syntactic construction.

Such observations may come as a slight disappointment to the linguist, whose job consists in accounting for all observations through a model that is as simple and elegant as possible. Here as in many other domains of the Na tone system, it is clear that the gap between the lexical tones of words and their tonal realization in context is not simply a matter of sandhi rules operating on a phonological level. The behaviour of the three-syllable noun ‘bear’, /gi+na+mi#/, as a determiner is a case in point: it patterns almost like disyllabic #H-tone nouns, such as ‘colt’, /zwa+zo#/, but not quite – when the head is a L-tone monosyllable, the output tone is MH#, instead of #H when the determiner is disyllabic.

Many of the combinations in Table 3 make sense in terms of the tone categories of the determiner and head, however. In the simplest cases, the tone of the determiner expresses itself first, then the tone of the head expresses itself to the extent allowed by the tones already assigned.

2.4.1. The simplest cases: only the tone of the determiner expresses itself.

Tones: H#, LH and L#

When the determiner has tone H# (a H tone on its last syllable), tonal oppositions on the head are neutralized, irrespective of the number of syllables: see the last lines of Table 3. The compound carries H#°, i.e. a H tone on the last syllable of the determiner. This can be analyzed as the result of the straightforward association of the H# tone to the determiner: H on its last syllable, and M on its first syllable, by default. The lowering of all the following tones to L results from Rules iii and iv: (iii) xyzH is always followed by L, and (iv) xyzstepping-down sequences (H+L and M+L) can only be followed by L tones. The same analysis can be extended to the two other tone categories of disyllables after which all tonal oppositions are neutralized: LH and L#. The former's tone pattern, applied to the first part of the compound (the determiner), precludes any tone other than L on the following syllables, by Rules iii and iv. The latter's L# tone attaches to the second syllable of the determiner, whose first syllable receives M by default; this ML sequence precludes, again, any tones other than L on the next syllables, by rule iv.

In the other cases, which constitute a broad majority, the tonal oppositions on the head are not entirely neutralized, and the tone pattern of the compound can be interpreted in light of the input tones of the two components: determiner and head.

2.4.2. Cases that can be interpreted in light of the two input tones

Cases that can be interpreted in light of the two input tones are arranged below by the tone of the determiner.

LM tone

A LM tone on the determiner results in the assignment of L on the first syllable of the compound, and M on its second syllable, in all cases. This leaves room for some of the tone categories of the head to manifest themselves, since a relatively high number of tone sequences are allowed after LM. Over three syllables, one may observe L.M.L, L.M.M, and L.M.H; over four syllables, only *L.M.L.M and *L.M.L.H are ruled out, because the sequence M.L can only be followed by L, by virtue of Rule iv ("All syllables following a HL or ML sequence receive L tone").

Accordingly, the tones that are compatible with the realization of an initial LM pattern are observed to manifest themselves in the compound: LM plus #H, LM plus MH#, LM plus H\$ and LM plus H# are realized as such – a concatenation of the two input tones. As expected, a M tone on the head has no effect on the final tone pattern, which is simply LM. The combinations LM plus #L and LM plus H# for quadrisyllabic compounds likewise surface as such.

Some of the surface patterns are analytically indeterminate. For instance, the result of the combination of a disyllabic LM determiner and a monosyllabic MH# determiner is L.M.MH (e.g. /boJ-ɬvɿ/ ‘pig’s brains’). This could be analyzed as L°MH#: L tone on first part, and MH# on second part. Or it could be analyzed as LM+MH#: the LM portion of the pattern yields L on the first syllable and M on the second, followed by assignment of a MH contour to the last syllable, in this case the second syllable. Both analyses are equivalent insofar as they generate the same output, but it appears simpler to describe this tone pattern as the concatenation of the two input tones: LM+MH#. Under this analysis, the pattern is the same for trisyllabic compounds and quadrisyllabic compounds ($\sigma\sigma + \sigma$ and $\sigma\sigma + \sigma\sigma$); the different surface patterns (L.M.MH for $\sigma\sigma + \sigma$, and L.M.M.H for $\sigma\sigma + \sigma\sigma$) result straightforwardly from the general rules of tone-to-syllable mapping summarized in §xyz of Chapter xyz.

If the compound is disyllabic, a L or LM tone on the head cannot express itself, since the determiner’s LM contour has already projected its endpoint (M) on the second syllable. While the M tone can in some respects be considered as default (see §xyz1.1.3 of Chapter xyz), as the endpoint of a LM contour it counts as a fully specified tone. Such cases are not typologically infrequent; this point will be returned to in the typological discussion, in Chapter xyz.) In derivational terms, this interpretation of the Yongning Na facts could be phrased as follows: at the point when the tone of the head could come into play, both syllables of the compound are already specified for tone, resulting in the neutralization of LM, M and L as the second members of disyllabic compounds with a LM determiner.

On the other hand, if the compound has three or four syllables, a L or LM tone on the head can express its L tone, resulting in LML on three-syllable compounds, and in LMLL on four-syllable compounds (by virtue of Rule iv: “All syllables following a HL or ML sequence receive L tone”).

To sum up, the tones of all compounds with a LM determiner obtains through the concatenation of that of their two components, modified by

subsequent application of the general rules that hold in tone groups (as recapitulated in §1.1.2xyz of Chapter xyz).

M tone

After M tone, one expects the tone of the second member of the compound to express itself fully. This prediction is not entirely carried out, however. As expected, the L and LM tones are neutralized after M due to Rule iv (“All syllables following a HL or ML sequence receive L tone”). On the other hand, as mentioned at the outset of this Chapter, the tone pattern #H (a floating H tone) that results from the combination of a M-tone determiner with a monosyllabic M-tone head does not obey the regularities brought out by the analysis of the other combinations. The #H° variant for disyllabic M-tone determiner plus H\$-tone head is likewise unexplained. A third unexpected pattern is the °L output of the combination of disyllabic M with monosyllabic MH#, which one would expect to surface as MH#, as is the case in all other three combinations (disyllable plus disyllable, monosyllable plus disyllable, and monosyllable plus monosyllable). These three cases point to the fact that some combinations are not simply the product of a set of rules applying throughout the tone system. Children acquiring Yongning Na need to learn a great number of tone patterns individually, acquiring tonal morphology in a comparable way to children learning the morphology of Rgyalrongic or Kiranti languages, to cite two subgroups of Sino-Tibetan that have flamboyant morphology (Michailovsky 1975; Van Driem 1990; Jacques 2004).

L tone, and the evidence its combinations offer for the analysis of the lexical tone of the head noun

Tone rule xyzi (§1.1.2.2) is that L tone spreads progressively (‘left-to-right’) onto syllables that are unspecified for tone. The tone patterns of compounds with L-tone determiners provide an interesting testing-ground to determine whether the lexical tones which have an initial M tone in their surface form are specified for tone on their first syllable or not: if they were, that initial M tone would be expected to block L-tone spreading; on the other hand, if that syllable is unspecified for tone, it should receive a L tone through spreading.

The observed patterns lend support to the analysis of the disyllables with High tone (#H, H\$, and H#) as unspecified for tone on the first

syllable: if the head has one of these tones, a L tone on the determiner spreads onto the first syllable of the head. The first syllable of the head is unspecified for tone: the tone of the head is H\$, a tone that attaches at the end of the word, even moving to the last syllable of the tone group. The L tone of the determiner therefore spreads onto the first syllable. The second syllable is specified for tone and therefore cannot receive the spreading L tone. The same analysis can be extended to the L# tone: L+L# yields H#, e.g. /k^hvɿmiɿ/ ‘dog’ and /iɿpiɿ/ ‘ear’ yield /k^hvɿmiɿ-iɿpiɿ/ ‘dog’s ear’, where the L tone on the first syllable of the head is analyzed as resulting from L-tone spreading. (More below about the H element in the tone of this compound.)

The weight of this argument is admittedly decreased by the fact that the tone patterns after a L-tone determiner cannot be generated through the application of a set of general rules. It is not entirely clear to what extent the processes at play in this particular morphosyntactic context (determinative compounds) relate to the general rule of L-tone spreading. If the determiner is monosyllabic and combines with another monosyllable, all oppositions are neutralized; the compound carries L tone. In the other three length combinations ($\sigma\sigma + \sigma\sigma$, $\sigma\sigma + \sigma$, $\sigma + \sigma\sigma$), the picture is more complex. A floating H tone (#H) on the head is always disregarded, and the result is L. In combination with a M-tone head, the result is L except for $\sigma\sigma + \sigma\sigma$ which yields L+H#: a sequence of L tones and a final H (L.L.L.H). The presence of a final H is not due to a general rule preventing the L tone from spreading more than one syllable to its right: for instance, the L+#H compound /joɿ-gvɿdvɿ/ ‘sheep’s back’ carries a simple L tone, which spreads over the two syllables of the head. (It surfaces as /joɿ-gvɿdvɿɿ/, with a final rise, due to postlexical H-tone addition: Rule xyz.) A combination of L+L on disyllables also yields a result that is unexpected under the hypothesis that the tones of the determiner and head are simply concatenated: L+#H° (surface form: L.L.H.L).

Ad hoc accounts can be put together for individual patterns, e.g. imagining, for the quadrisyllabic combination of L and H\$ (illustrated by /k^hvɿmiɿ-hoɿmiɿ/ ‘dog’s stomach’), that the L tone spreads onto the first syllable of the head, which is unspecified for tone, and is then blocked by the presence of a tonal specification on the last syllable; the resulting L+H\$ pattern is neutralized with L+H#, yielding the surface result. However, such accounts do not generalize to the entire data set. For instance, in some cases it seems as if dissimilation were at play. In the example /k^hvɿmiɿ-nvɿmiɿ/ ‘dog’s heart’, from a L+L input, there is a H

tone on the first syllable of the head; this suggests a process of dissimilation whereby the L tone on the head dissimilates to an initial H tone. A L+L input yields a simple L output for words of other lengths, however ($\sigma\sigma+\sigma$, $\sigma+\sigma$ and $\sigma+\sigma\sigma$). Here again, it appears that these patterns are learnt individually and applied in table-lookup fashion, rather than through the application of a set of rules.

H tones: #H, H#, H\$

Compounds with a #H-tone determiner have the same output tone whether the determiner is monosyllabic or disyllabic; this is taken as a confirmation of the initial hypothesis that the tone category of monosyllables illustrated by /z̥wæ#ɿ/ ‘horse’ and the category of disyllables illustrated by /giɿz̥w#ɿ/ ‘little brother’ are phonologically identical. For the sake of typographical simplicity, and in the absence of an opposition between different types of H tones on monosyllabic nouns, ‘horse’ is nonetheless transcribed as /z̥wæɿ/ rather than /z̥wæ#ɿ/, omitting the information on the segmental anchoring of its H tone.

For the H tones (#H, H#, H\$) as for the L tone, there are differences in the tone of the compound depending on the number of syllables of the head noun. Attempts at generating the tones of these compounds from the input tones on the basis of a set of rules were unsuccessful. A general observations can be made nonetheless:

(xyzR) A floating H (#H) and a tone-group-final H (H\$) are never observed to reassociate more than one syllable to their right.

Regularity (xyzR) is specific to determinative compounds. It does not hold in other parts of the tonal morphology, witness the following example: /laɿtʰaɿmiɿ\$/ ‘Latami’ (family name), /laɿtʰaɿmiɿ=ɿɿ-ŋuɿ/ ‘...by the Latamis’, where tone H\$ moves two syllables away from the word to which it is lexically attached.

In combinations with a monosyllabic head, the #H tone is preserved in six cases out of ten; as this tone attaches at the end of the word that carries it, this amounts to a one-syllable shift to the right from its original position. In combinations with a disyllabic head, the #H tone is never present in the output, as if it could not move more than one syllable away from its original position without changing its nature. In eight of the sixteen combinations, it turns into a fixed, word-final H tone (H#).

In this light, the H# tone that obtains on H#-plus-H# combinations (with a disyllabic head) must be interpreted as originating in the H# tone of the head, not of the determiner.

The above generalization captures the fact that the H\$ tone never surfaces on compounds with a disyllabic head. But no hypothesis can be proposed as to why it surfaces when the head is a L-tone monosyllable, and not in association with any other monosyllabic head. Interestingly, the seven combinations that have two or three variants all involve a H\$-tone head noun, pointing to the relatively marginal status of this tone.

MH tone

In determinative compounds, tone MH, like other tones containing a H level, is not observed to move more than one syllable to the right. When the head is monosyllabic and the determiner disyllabic, a MH tone on the determiner moves onto the last syllable of the compound; in $\sigma + \sigma$, on the other hand, the MH tone does not move as a whole: it appears to remain associated to the head, and to project its H level onto the head – except when the head has a #H or MH tone. Again, those are simply piecemeal observations: no set of rules can be proposed to generate the tones of these compounds from the input tones.

LM+MH# and LM+#H tones

The behaviour of LM+MH# and LM+#H when they appear on determiners provides evidence for their phonological analysis. In the abstract, the former could be analyzed as L+MH#: for the surface patterns in isolation, this would yield a /L.MH/ output tone string, the same as LM+MH#, and the label would be shorter. But if this tone were phonologically L+MH#, its initial L level would be expected to spread as a sequence of Ls, followed by a final MH contour. In fact, these two categories (LM+MH# and LM+#H) unfold as L.M over the first two syllables of polysyllabic compounds, showing that they are to be analyzed as comprising a LM pattern.

Apart from this observation, the interpretation of individual combinations is not straightforward. The cases that seem to make good sense in terms of the input tones do not greatly outnumber those that seem opaque. For instance, LM+MH# followed by a monosyllable with #H or MH yields a pattern comprising a tone-group-final H tone (H\$), exactly like a combination of monosyllables with MH on the determiner and #H or

MH on the head; but the parallel ends here: if the head is a L-tone monosyllable, a MH-tone determiner yields a final H tone (H#), whereas a LM+MH# determiner yields a tone-group-final H (H\$).

2.4.3. About the neutralization of tonal oppositions on the head

Four tonal classes of disyllabic head nouns always behave in the same way: the opposition between LM, LH, LM+#H and LM+MH# is neutralized. This fact is not the direct result of the application of the tone rules that hold throughout the tonal grammar of Yongning Na, as set out in Chapter xyz. In principle, one could imagine a morphotonological rule whereby L tone on the determiner and LM+MH# on the head would yield L°LM+MH# on the entire compound, through the simple concatenation of the two tones. Thus, ‘sheep’s waist’ (input tones: L and LM+MH#) would be /*joł-jilʈsæł/.

While such a compound does not violate conditions on well-formedness, one can speculate about language-internal tendencies that arguably go against it. As observed at the outset of §2.4, in the simplest cases, the tone of the determiner expresses itself first, then the tone of the head expresses itself to the extent allowed by the tones already assigned. The four categories LM, LH, LM+#H and LM+MH# all have an initial L tone; in almost all cases, expression of this L tone results in the creation of a H.L or M.L sequence. Taking the simple example of a M-tone determiner, such as /połloł/ ‘ram’, and a LM+MH#-tone head, such as /jilʈsæł/ ‘waist’, tone assignment can be hypothesized to take place as follows: (i) the compound /połloł-jilʈsæł/ ‘ram’s waist’ first receives M on its first two syllables, from association of the M tone of the determiner, yielding /połloł-jilʈsæł/; (ii) since the tone of the determiner is M, a tone that does not spread, the tone of the head can express itself, by left-to-right association of its tone pattern; its first syllable receives L, through association of the first tone level in the LM+MH# pattern, yielding /połloł-jilʈsæł/; (iii) the last syllable receives L tone through application of Rule 5: “All syllables following a HL or ML sequence receive L tone”. This yields /połloł-jilʈsæł/.

Another way of thinking of it would be to consider that the entire tone pattern gets associated to the head, yielding /*połloł-jilʈsæł/, and that this expression, which does not constitute a well-formed tone sequence due to the presence of a trough in the middle (the L in the M.M.L.MH sequence), is repaired by deletion of the final MH sequence and its replacement by L. Rule 5 could then be rephrased as Rule 5’: “All syllables following a HL or

ML sequence are lowered to L”. Rule 5’ would apply after association of the entire LM+MH# tone pattern, whereas under the present account, Rule 5 applies as soon as the M.L sequence is created: as soon as a L tone associates to the syllable /...-ji.../. Since both views do not have any different practical implications, the choice of one or the other can be made freely in view of one’s theoretical preferences.

The situation illustrated by /po-lo-t-jilʈsæ/ ‘ram’s waist’ is widespread: the only case in which a tone pattern beginning in L could express itself fully on the head is when the determiner has L tone, as in the fictitious example of a realization of ‘sheep’s waist’ (input tones: L and LM+MH#) as /*jo-t-jilʈsæ-t/. In this light, the neutralization of the opposition between LM, LH, LM+#H and LM+MH# in this context can be viewed as the generalization of a pattern of neutralization which in most cases obtains simply by application of Rule 5: “All syllables following a HL or ML sequence receive L tone”.

2.5. Slips of the tongue

Hesitations, variants, and tonal slips of the tongue can point to a certain closeness between tone patterns. A full-fledged study of this captivating topic would require more fine-grained tools than were employed so far. The boundary between an acceptable variant and a commonly occurring mistake is not altogether clear, and the main consultant’s judgments sometimes wavered between the one and the other. While the greatest care was exercised to verify the data, the initial dichotomy between starred forms (mistakes) and acceptable variant would need to be followed up by specific experiments to ascertain the degree of acceptability of variants along a precise scale. (On the notion of gradient acceptability, see e.g. Goldrick 2011; Kirby and Yu 2007.)

A look at the mispronunciations in the recorded Na data suggest that M is more liable to confusions with #H than with other tones. For instance, errors involving /la-t/ ‘tiger’ consist in the substitution of the tone pattern expected for a #H-tone word: /*la-t-tv/ ‘tiger’s brains’, instead of /*la-t-tv-t/; and /*la-t-ho-mi/ ‘tiger’s stomach’, instead of /la-t-ho-mi-t/ (there are two instances of both of these mistakes; the recordings are: Tone6 and Tone7).

There are also instances of substitutions between H\$, MH# and H#, e.g. /*hw-t-li-t-s-t/ instead of /hw-t-li-t-s-t-t/ for ‘cat’s blood’, and /*hw-t-li-t-tv-t/ instead of /hw-t-li-t-tv-t/ for ‘cat’s brains’. There are also cases of

confusions between LM+H# and LM+MH#^o over compounds involving a LM+#H-tone head. In the first case, a H tone floats all the way to the last syllable of the compound. In the second case, a H tone associates to the first syllable that follows the determiner.

Some errors could be put down to the application of rules that hold elsewhere in the tone system, such as the spreading of L, leading for instance to /k^hɿ̌mǐ-ɿ̌/ instead of /k^hɿ̌mǐ-ɿ̌/ (recording: Tone12). This suggests another perspective for exploring slips of the tongue: determining in which morphosyntactic constructions the tone patterns would count as correct. This would contribute to a geography of the various areas of Na morphotonology, bringing out which constructions are best kept apart by the speakers and which are harder to keep distinct.

2.6. Cross-speaker differences

The entire data set discussed so far was provided by the consultant of reference, F4. Data were also elicited from three other speakers: F5, who is F4's daughter-in-law; M21, a relative of F4, belonging to the same generation; and M23, who is M21's son. All three are slightly less proficient speakers than F4, due to long stays away from Yongning in the case of M21, and to a generation gap in the case of F5 and M23, both proficient speakers of Southwestern Mandarin.

Some of the differences reflect the fact that the nouns at issue belong in different categories in the speech of the two consultants. For instance, 'flea' is /kv̌ʂěʂ/ in F4's speech (LH tone), whereas in M21's speech it is /kv̌ʂěʂ/ (#H tone). Likewise, 'boar' is /bǒʂǎ/ in F4's speech (LH tone), whereas in M21's speech it fluctuates between /bǒʂǎ/ and /bǒʂǎ/ (LM+MH# tone). The difference in tones for 'boar's nose' between the two speakers – /bǒʂǎ-nǐgɿ̌/ for F4 (tone: LH), and /bǒʂǎ-nǐgɿ̌#/ (tone: LM+#H) for M21 – is to be interpreted in this light: it does not originate in a difference in the rules that determine the tonal output for compounds, but in a difference in input tones. Both compounds follow the regularities summarized in Table 3, but the input combination is different.

The cross-speaker differences reported below, on the other hand, are due to differences in the tone rules. [www WORK IN PROGRESS. LOTS OF RECORDINGS TO ANALYZE AND ANNOTATE... A FAIRE: MISE EN FORME COMPLETE DONNEES TONS COMPOSITION M21, M23, F5]

24 The noun phrase, Part I: Compound nouns

To begin with a comparison within close age groups, Table 4 presents an overview of differences between F4 and M21.

Table 4. Differences between speakers F4 and M21 in the tones of compounds. As elsewhere, the notations $\sigma\sigma+\sigma$, $\sigma+\sigma$ etc. are used to indicate the number of syllables.

input	output		example
	F4	M21	
M + M ($\sigma + \sigma$)	#H	L#	‘tiger’s intestine’: la↓-bv#↓ vs. la↓-bv↓
#H + H\$ ($\sigma\sigma + \sigma\sigma$)	H#, H\$, or #H°	°L	‘colt’s stomach’: zɥwæ↓zo↓- ho↓mi↓ vs. zɥwæ↓zo↓-ho↓mi↓

An interesting characteristic of these differences is that they still have a family resemblance. The combination of M+M over monosyllables is odd in both cases: why not use a simple concatenation of the input tones, yielding M tone for the compound, as happens for the other M+M compounds ($\sigma\sigma+\sigma\sigma$, $\sigma\sigma+\sigma$ and $\sigma+\sigma\sigma$)? For both F4 and M21, one can say that the output differs from what would be expected as default. It is thus exceptional in both cases, although in different ways.

The combination #H+H\$ over disyllables ($\sigma\sigma+\sigma\sigma$) is also very different for the two speakers, who both refused the other’s variant when I tried it on them. But again, M21’s pattern is not that different from F4’s: the same output (°L tone) is found in F4’s data, when the same tones are carried by monosyllables ($\sigma+\sigma$).

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2.7. Exceptional items

Some compounds possess lexical tones that differ from those that would be expected on the basis of their constituting elements. Examples are provided in Table 5. These examples are discussed one by one below.

Table 5. Compounds whose tones differ from those that would obtain from the application of the synchronic tone rules

word	meaning	tone	observed compounds	expected pattern
naJhĩ#l	Naxi	LM+#H	naJhĩl-k ^h uɿdziɿ; naJhĩl-baɿlaɿ	LM + MH#°; LM + #H°
niɿgɣ#l	nose	#H	niɿgɣɿ-dzuɿl	#H
mvɿ	ciel	#H	mvɿ-koɿ, mvɿ-hĩl	
	cows' stable	MH#	jiɿbvɿl	#H
tɕaɿbɣɿ	powder	M		

2.7.1. The noun 'Naxi'

The noun 'Naxi' (/naJhĩ#l/, tone LM+#H) yields irregular results in two quadrisyllabic compounds (see the recording *TonePeoples*):

(i) with tone MH#: /naJhĩl-k^huɿdziɿ/ 'Naxi puttee'. The regular tone pattern would be: /*naJhĩl-k^huɿdziɿl/ (with underlying tone: LM+MH#°); however, this pattern is not acceptable. The observed tone is LM+#H°. An example of the regular tone pattern is /naJhĩl-ŋwɣɿp^hæɿl/ 'Naxi tile'.

(ii) with tone L: /naJhĩl-baɿlaɿ/ 'Naxi clothes'. The regular tone pattern would be: /*naJhĩl-baɿlaɿl/ (underlying tone: LM+#H°, which can also be described as LM+MH#°), but it is not acceptable. The observed tone is LM+H#. An example of the regular tone pattern is /naJhĩl-suɿl^hiɿ/ 'Naxi knife'.

'Naxi' has a special status in Yongning Na. On the one hand, it refers to an ethnic group perceived as distinct from the Na: the Naxi of the Lijiang plain, including people who settled in Yongning since the early 20th century but retain their distinct costumes and language. On the other hand, it is made up of the endonym of the Na, compounded with the word for 'person, human being', so that its independence from 'Na' is problematic. The exceptional treatment of this noun may have to do with the perceived necessity of handling the term in such a way as to attempt to avoid its perception as a compound meaning 'Na person'.

2.7.2. The nouns 'nose' and 'hair'

'Mucus' is /niɿgɣɿ-dzuɿl/ 'mucus' (tone: MH#); on the basis of /niɿgɣ#l/ 'nose' and /dzuɿ/ 'water', the expected tone would be #H (/niɿgɣɿl-

dzu#l/). Likewise, ‘hair’ is /ko-thv-l/; on the basis of /ko/ ‘head; top’ and /hɿ/ ‘hair’, one would expect /*ko-thv#l/.

The etymology of these two words seems self-evident, but it is also clear that mucus is not just a kind of water (‘nose-water’). The difference between hair on the head and on the body is thinner, but many languages have different terms for both, even if they share the same root, as in Na (where ‘body hair’ is /ziJhɿ#l/, literally ‘ape hair’). These semantic distinctions may shed light on the irregular tone patterns of these two words, suggesting an early lexicalization of the compound. The discrepancy between the tones of these items and the output of the currently productive tone rules for compounds may be due to different tone rules that applied at the time when they were created. Or they may result from an evolution of the compound away from the regular tone pattern, triggered by the perception of their status as lexical units rather than compounds. In the abstract, this second possibility might sound less plausible than the first; but item-by-item tone change accompanying lexicalization is a salient characteristic of the tone system of Laze, a language closely related to Na (Michaud 2008; Michaud 2009; Michaud and Jacques 2012), so this possibility cannot be lightly dismissed.

2.7.3. *The noun ‘flour, powder’*

The word for ‘powder, flour’ is /tsa-lɣ-l/, with M tone. According to the synchronically productive rules, the combination of this word with /lv-mi-l/, ‘stone’, /q^ha-dze-l/ ‘sweetcorn’ and /dze-lu-l/ ‘wheat’ should yield a simple M-tone output, e.g. /*lv-mi-l-tsa-lɣ-l/ for ‘fine sand’.) But the observed forms are /lv-mi-l-tsaJɣJ/ ‘fine sand’, /q^ha-dze-l-tsaJɣJ/ ‘sweetcorn flour’, and /dze-lu-l-tsaJɣJ/ ‘wheat flour’, all with a M.M.L.L tone pattern (phonological notation: °L). This may well be related to the fact that /tsa-lɣ-l/ is a Tibetan loanword; as for the exact reason why the word acquires L tone in these compounds, there is no way to tell, until a detailed study of the various layers of Tibetan loanwords can be conducted.

2.7.4. *The noun ‘sky’*

The disyllabic form of the noun ‘sky’ is /mv-lko-l\$. The monosyllabic root for ‘sky’ is /mv-l/; if the second syllable were /ko/ ‘head; top’, one would expect the compound to have tone #H (on the basis of the regularities set

out in Table 2). But the second syllable may be the particle ‘on’ – itself likely to be grammaticalized from ‘head’.

3. Coordinative compounds

3.1. The main facts

In the closely related language *Naxi*, the tones of coordinative compounds are simply the concatenation of those of their constituents, e.g. /*ni·nvJ-jæ·lqæJzu·*/ ‘wife and husband’ – a compound whose ethnolinguistic interest admittedly makes up in part for its tonal inertia: as the Chinese-influenced *Naxi* of *Lijiang* like to point out, this compound places the wife in front of the husband, in contradiction of basic Confucian principles. Discussions of the role of women in *Naxi* society soon wander back to lake *Lugu* and the *Yongning* plain, to which we also return presently for a discussion of the coordinative compounds of *Yongning Na*, which are tonally active, to an extent comparable with determinative compounds.

Coordinative compounds are less common than determinative compounds, however, and less easy to elicit systematically. Any pair of nouns can in principle be coordinated, witness, in English, the names of public houses. Once the pattern is established, through combinations which were initially motivated (like “Fox and Hounds” or “Dog and Duck”, referring to hunting traditions; or “Bear and Ragged Staff”, from heraldry), new ones can be created at will, such as the humorous “Snail and Salad”, where the relationship between the two terms – and their relationship to the food served in the pub – is offered to the customer’s fancy. In *Yongning Na*, any two nouns can be coordinated by means of the conjunction /-la/ (see §xyz of Chapter xyz), but coordinative compound nouns are not as easy to coin.

Three sources were found: pairs of animal names of the two sexes, and their offspring, such as ‘ewe and ram’, ‘ram and ewe’, ‘ewe and lamb’, and ‘ram and lamb’; pairs of kinship terms, such as ‘uncle and nephew’ and ‘mother and daughter’; and successive numerals followed by the same classifier, such as ‘two or three years’, ‘five or six months’ or ‘four or five days’. A broad sample of the first two sets can be found in the online recording *CoordinativeCompounds*; the second set is found in *CoordinativeCompounds2*. The consultant (F4) clearly preferred to remain within the bounds of common sense, and semantically inappropriate pairs

such as ‘mother and nephew’ or ‘grandmother and brother’ were avoided. The elicited data are set out in Table 6. As elsewhere, a slash separates variants. Some tone patterns that were proposed by the investigator and refused by the consultant are indicated, with a star, in the output column: for instance, in view of the existence of two variants for the L+L combination /zyɿɿɿ-ŋwɿɿɿ/ / zɿɿɿɿ-ŋwɿɿɿ/ ‘four or five months’, the L variant was attempted for other L+L combinations, such as ‘nephews and nieces’, /zeɿɿɿ-zeɿɿɿ/. The fact that the L variant is not possible for these expressions (/ *zeɿɿɿ-zeɿɿɿ/) is indicated through the mention ‘(*L)’ in the output column.

Three suffixes appear repeatedly in the table: the female/augmentative suffix /-mi/, the male suffix /-p^hv/, and the child/diminutive suffix /-zo/. They are discussed in Chapter xyz, §xyz.

Most examples are quadrisyllabic, from two input disyllables (σσ+σσ). The two disyllabic examples (σ+σ) at the top of the table are written without a hyphen, on the basis of the intuition that they are more strongly integrated than the others. Trisyllabic examples are of the structure *disyllable plus monosyllable* (σσ+σ), showing a preference for coordinative compounds where the first term has at least as many syllables as the second. Hexasyllabic compounds can be created, witness /ŋwɿɿɿ-ɿɿɿmiɿ-q^hvɿɿ-ɿɿɿmiɿ/ (Dog2.xyx) ‘the fifth and sixth months’. example was

Table 6. Examples of coordinative compounds, arranged by input tones.

compound	meaning	input	output
mvɿdiɿɿ	universe (‘sky’+‘earth’)	H and LM	MH#
zoɿmvɿɿ	child (‘son’+‘daughter’)	H and LH	H#
əɿmiɿɿ-mvɿɿ	mother and daughter	M and LH	°L
əɿmiɿɿ-zo#ɿɿ	mother and son	M and #H	#H
əɿdaɿɿ-mvɿɿ	father and daughter	H\$ and LH	H#
əɿdaɿɿ-zo#ɿɿ	father and son	H\$ and H	#H
əɿp ^h vɿɿ-zɿvɿv#ɿɿ	great-uncle and great-nephews	M and M	#H
əɿp ^h vɿɿ-zɿvɿmi#ɿɿ	great-uncle and great-nieces		
əɿsiɿɿ-əɿp ^h v#ɿɿ	3 rd -generation ancestors		
əɿsiɿɿ-zɿvɿmi#ɿɿ	(great-)grandmother and granddaughters		
əɿsiɿɿ-zɿvɿv#ɿɿ	great-grandmother and grandsons		
gvɿdvɿɿ-gvɿmiɿɿ	(human) body	M and M	M
joɿmiɿɿ-poɿloɿɿ	ewe and ram		

qzwałmił-qzwałp ^h vł	male and female sparrow		
qurłłił-niłłił	one or two months		
niłłił-sołłił	two or three months	M and M	°L
bəłmił-bəłp ^h vł	female and male duck	M and #H	#H
bəłmił-bəłzoł	female duck and duckling		
bvłmił-bvłzoł	female yak and baby yak		
surłłił-hōłłił	seven or eight months	M and H\$	#H
əłmił-zełmił	aunt and niece	M and L	°L
əłmił-zełvł	aunt and nephew		
bvłmił-bvłswəł	female and male yak		
dzołmił-dzołp ^h vł	female and male lizard		
sołłił-zyłłił	three or four months		
giłzuł-gołmił	little brothers and sisters	#H and M	#H
bəłzoł-bəłmił	duckling and female duck		
bəłp ^h vł-bəłmił	male duck and female duck		
ts ^h urłzoł-tołqał	kids and little nanny goats	#H and M	H#
zyłvł-zyłmił	grandchildren	#H and #H	H#°
hwɣłp ^h vł-hwɣłzoł / hwɣłp ^h vł-hwɣłzoł	tom-cat and kitten	#H and #H	#H / #H°
hołmił-hołp ^h vł / hołmił-hołp ^h vł	female and male pheasant		
dziłmił-dziłzoł / dziłmił-dziłzoł	female and baby buffalo		
dziłzoł-dziłmił / dziłzoł-dziłmił	baby and female buffalo		
lałmił-lałp ^h vł / lałmił-lałp ^h vł	female and male tiger		
lałmił-lałzoł / lałmił-lałzoł	female and baby tiger		
zyłnił-ɣwɣłnił / zyłnił-ɣwɣłnił	four or five days		
kvłp ^h vł-kvłmił	male and female crane	#H and MH	#H
hwɣłp ^h vł-hwɣłmił	tom-cat and she-cat	#H and H\$	H#
hwɣłzoł-hwɣłmił	cats: kitten and parents		
ɣwɣłnił-q ^h vłnił	five or six days	#H and H\$	°L
surłnił-hōłnił	seven or eight days		
zwałzoł-zwałmił / zwałzoł-zwałmił	colt and mare	#H and L	#H° / H#
p ^h xłp ^h vł-p ^h xłmił /	male and female hyena		

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p ^h x ^h tp ^h v ^h -p ^h x ^h mi ^h			
gv ^h ni ^h -ts ^h e ^h ni ^h /	nine or ten days	#H and L	°L /
gv ^h ni ^h -ts ^h e ^h ni ^h			L+H#
k ^h v ^h zo ^h -k ^h v ^h mv ^h /	male and female puppies	#H and H#	H#° /
k ^h v ^h zo ^h -k ^h v ^h mv ^h			H#
ə ^h zi ^h -ə ^h p ^h v ^h	elders, grandparents	MH# and M	MH#
æ ^h mv ^h -go ^h mi ^h	sisters, female siblings	MH# and M	H#
ə ^h zi ^h -z ^h v ^h /	grandmother and grandsons	MH# and	#H°
ə ^h zi ^h -z ^h v ^h mi ^h	grandmother and granddaughter	#H	
æ ^h mv ^h -gi ^h z ^h u ^h	brethren, brothers		
q ^h u ^h -k ^h v ^h -ni ^h k ^h v ^h	one or two years	MH# and	MH#°
		MH#	
ə ^h v ^h -ze ^h v ^h /	uncle and nephew	MH# and L	MH#°
ə ^h v ^h -ze ^h mi ^h	uncle and niece		
zo ^h -h ^h v ^h -mv ^h zo ^h	descendants		
ni ^h -k ^h v ^h -so ^h k ^h v ^h /	two or three years	MH# and L	H#
(*ni ^h -k ^h v ^h -so ^h k ^h v ^h)			
ʃu ^h -k ^h v ^h -h ^h o ^h k ^h v ^h /	seven or eight years	MH# and	MH#° /
ʃu ^h -k ^h v ^h -h ^h o ^h k ^h v ^h		H#	H#
ts ^h u ^h -mi ^h -po ^h lo ^h	nanny goat and billy goat	H\$ and M	H#
ə ^h da ^h -ə ^h mi ^h #	father and mother, parents	H\$ and M	#H
q ^h v ^h -i ^h -ʃu ^h ni ^h	six or seven months	H\$ and M	H#°
ə ^h ni ^h -ts ^h i ^h ni ^h #	these days	H\$ and #H	#H
ə ^h ji ^h -ts ^h i ^h ji ^h #	these years		
tʃ ^h æ ^h -mi ^h -tʃ ^h æ ^h zo ^h #	doe and stag		
hw ^h x ^h -mi ^h -hw ^h x ^h zo ^h # /	she-cat and kitten	H\$ and #H	#H /
hw ^h x ^h -mi ^h -hw ^h x ^h zo ^h \$			H\$
hw ^h x ^h -mi ^h -hw ^h x ^h p ^h v ^h /	she-cat and tom-cat	H\$ and #H	#H° /
hw ^h x ^h -mi ^h -hw ^h x ^h p ^h v ^h # /			#H /
hw ^h x ^h -mi ^h -hw ^h x ^h p ^h v ^h \$			H\$
q ^h v ^h -ni ^h -ʃu ^h ni ^h /	six or seven days	H\$ and #H	H#° /
q ^h v ^h -ni ^h -ʃu ^h ni ^h /			#H° /
q ^h v ^h -ni ^h -ʃu ^h ni ^h #			#H
(*q ^h v ^h -ni ^h -ʃu ^h ni ^h \$)			
h ^h o ^h -ni ^h -gv ^h ni ^h /	eight or nine days		
h ^h o ^h -ni ^h -gv ^h ni ^h /			
h ^h o ^h -ni ^h -gv ^h ni ^h #			
(*h ^h o ^h -ni ^h -gv ^h ni ^h \$)			
ni ^h -ni ^h -so ^h ni ^h (*ni ^h -ni ^h -	two or three days	H\$ and	H#

soɭpiɭ)		MH#	
ɖuɔɭniɔ-ɖuɔɭhãɭ (*ɖuɔɭniɔ-ɖuɔɭhãɭ)	one day and one night	H\$ and MH#	#H°
tsʰæɔɭmiɔ-tsʰæɔɭzo#ɭ ɖuɔɭniɔ-niɔni#ɭ	doe and fawn one or two days	H\$ and H\$	#H
hõɭɬiɭ-gvɭɬiɭ niɔniɭ -soɭpiɭɭ	eight or nine months two or three days	H\$ and L	H#°
əɭjiɔ-sʷuɭjiɭ	in the past	H\$ and LM+#H	#H°
bvɭɬwæɭ-bvɭmiɭ/ bvɭɬwæɭ-bvɭmiɭ	male yak and female yak	L and M	L / L+#H°
kɔɭpʰvɭ-kɔɭmiɭ/ kɔɭpʰvɭ-kɔɭmiɭ	male and female falcon		
dzoɭpʰvɭ-dzoɭmiɭ/ dzoɭpʰvɭ-dzoɭmiɭ	male and female lizards		
mvɭzoɭ-əɭmiɭ / mvɭzoɭ-əɭmiɭ	young woman and (her) mother	L and M	L+#H° / L+H#
gvɭɬiɭ-tsʰeɭɬiɭ/ gvɭɬiɭ-tsʰeɭɬiɭ	nine or ten months		
mvɭzuɭ-niɭmiɭ	brothers and sisters	L and #H	L+#H°
zʷæɭmiɭ-zʷæɭzoɭ soɭpiɭ-zʷɭpiɭ	mare and colt three or four days	L and #H	L
ŋwɔɭɬiɭ-qʰvɭɬiɭ	five or six months	L and H\$	#H°
jiɭmiɭ-zɔɭqoɭ zeɭvɭ-zeɭmiɭ	cow and veal nephews and nieces	L and L	L+#H° (*L)
jiɭbvɭ-jiɭmiɭ pɔɭmiɭ-pɔɭpʰvɭ	bull and cow female and male frog		
pʰɔɭmiɭ-pʰɔɭzoɭ	female and child hyena		
zʷɭɬiɭ-ŋwɔɭɬiɭ / zʷɭɬiɭ-ŋwɔɭɬiɭ	four or five months	L and L	L / L+#H°
soɭkʰvɭ-zʷɭkʰvɭ	three or four years	L and L#	L+H#
zʷæɭsʷuɭ-zʷæɭzoɭ	stallion and colt	L# and #H	L#°
zʷæɭsʷuɭ-zʷæɭmiɭ gvɭkʰvɭ-tsʰeɭkʰvɭ	stallion and mare nine or ten years	L# and L	L#°
zʷɭkʰvɭ-ŋwɔɭkʰvɭ	four or five years	L# and L#	L#°
ŋwɔɭkʰvɭ-qʰvɭkʰvɭ	five or six years	L# and H#	L#°
ɑɭkoɔ-zɔɔɔvɔ	the household	LM and M	LM°
pʷɭtsʷuɭ-pʷɭmiɭ pɔɭɬeɔɔ-pɔɭmiɭ	combs tadpole	LM+MH# and L	LM+M H#°

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æɭmiɫ-æɫswæɫ	hen and cock	LM and H#	LM+H
æɭmiɫ-æɫtsuɫ	hen and chicks		#
boɭmiɫ-bæɫbvɫ	sow and piglets		
zæɫp ^h vɫ-zæɫmiɫ	male and female panther	LM and LM+#H	LM°L
dvɫmiɫ-dvɫp ^h vɫ	female and male weasels	LM+#H and LM	LM+# H°
ɑɭmiɫ-ɑɫp ^h vɫ	female and male goose	LM+#H and	LM+#
qʉɫzoɫ-qʉɫmiɫ	female and male mule	LM+#H	H°
q ^h vɫk ^h vɫ-ʂʉɫk ^h vɫ	six or seven years	H# and MH#	H#°
hõɫk ^h vɫ-gvɫk ^h vɫ	eight or nine years	H# and L#	H#°
æɫswæɫ-æɫmiɫ	cock and hen	H# and LM	H#°
ŋwɔɫɫiɫmiɫ-q ^h vɫɫiɫmiɫ	the fifth and sixth months	H# and LM	H#°

3.2. Discussion: tonal variability and semantic-lexical diversity

The existence of variants was already observed for some determinative compounds (see Table 3), but the overall proportion of combinations that have variants is low: 7 combinations out of 257, all of which have H\$ tone on the head noun. For coordinative compounds, on the other hand, less regularity is observed. There exist not only tonal variants, but compounds with identical input tones and different outputs. Among quadrisyllabic compounds, two different outputs (on different examples) are found for no less than six tonal combinations: those with input tones M and M; #H and M; MH# and M; H\$ and M; H\$ and #H; and L and #H. A seventh combination, #H and #H, even has three different outputs. For quadrisyllabic compounds, the proportion of tone combinations with two or three different outputs is about one out of four.

The general picture is thus one of great tonal variability. But coordinative compounds are not simply characterized by a general looseness of their tone patterns, whereby two or three tonal variants would be acceptable for any combination of input tones: for instance, the consultant considers it incorrect to say /*giɫzuɫ-goɫmiɫ/ for ‘little brothers and little sisters’, /*ts^huɫzoɫ-toɫqaɫ/ for ‘kids and little nanny goats’, /*əɫziɫ-əɫp^hvɫ/ for ‘ancestors’, /*æɫmvɫ-goɫmiɫ/ for ‘sisters’, /*ts^huɫmiɫ-poɫloɫ/ for ‘nanny goat and billy goat’, or /*əɫdaɫ-əɫmiɫ/ for ‘father and mother’. Pronunciation habits develop for certain items, which come to have a habitual tone pattern to the exclusion of others.

This relates to the semantic diversity of coordinative compounds. Importantly, it is not always possible to arrive at the meaning of coordinative compounds simply on the basis of their two constituents. For instance, /hwɿtsoɿ-hwɿtmiɿ/, made up of ‘kitten’ and ‘she-cat’, does not mean ‘kitten and she-cat’ (the child and the mother), but refers to cats in general, as a species. More spectacularly, the terms for male and female puppies, /k^hvɿtsoɿ/ and /k^hvɿtmvɿ/ respectively, are used as names for human newborns: an unlovely name is purposely chosen to repel demons who may be lurking around to take their lives. The real name is only given after a couple of months; sometimes as late as one full year after birth. The two terms /k^hvɿtsoɿ/ and /k^hvɿtmvɿ/, and their compound /k^hvɿtsoɿ-k^hvɿtmvɿ/, have become culturally specialized and cannot be used to refer to real puppies. (This type of information is not systematically recapitulated in Table 6, and must be looked up in the Glossary.) There is thus a broad range of situations, from elicited combinations which the consultant may never have conceptualized before (such as ‘male and female jackal’) to highly lexicalized expressions.

This sheds indirect light on the observed tonal variability; however, the overall number of examples is too small to make out with confidence which of these outputs are currently productive. It may be that some disyllables are treated as indecomposable units whereas others are treated as compounds, with different tonal outputs. For instance, ‘she-cat’ and ‘tom-cat’ both have the same lexical tone (H\$), but ‘she-cat and tom-cat’ and ‘tom-cat and she-cat’ have different tone patterns; this could derive from a stronger perception of the second syllable as an affix for one of these two nouns. It is likely that the two compounds have different degrees of lexicalization (frequency of use); one may follow currently productive rules whereas the other is learnt as a single unit.

The tone patterns observed in these data are summarized in Table 7. When two different (and mutually exclusive) patterns are observed over different compounds, these patterns are separated by a semi-colon. In cases of free variation (over the same compounds), the patterns are separated by a slash. In order to save space, tone categories for which there are no examples are omitted from the table. Slashes separate variants, and semicolons different outputs for the same input.

Table 7. *The tone patterns of coordinative compounds. Part a: combinations with monosyllabic second noun.*

	1 st noun ↓ ; 2 nd noun →	monosyllables		
		LM	L	#H
monosyllables	#H	MH#	H#	
disyllables	M		°L	#H
	H\$		H#	#H

Part b: combinations among disyllables.

1 st N ↓ ; 2 nd N →	M	#H	MH#	H\$	d3 L	LM+# H	LM	H#
M	M; #H	#H			°L			
#H	H#; #H	H#°; H#/#H°	#H	H#	#H° / H#			H# / H#°
MH#	MH#; H#	MH#°			MH#°			
H\$	H#; #H	#H; #H° / H#	#H°	#H		#H°		
L	L+H# / L+#H°	L; L+#H°			L +#H°			
L#		L#°			L#°			
LM					LM			
+MH#					+MH# °			
LM+#H						LM +MH# °	LM+ MH#°	
LM	LM°					LM°L		LM+ H#
LH								
H#							H#°	

Sixty percent of the combinations are identical with those found on determinative compounds. These include combinations for which a straightforward account can be proposed (see §xyz above: xx1.4). There is a considerable proportion of empty cells, to which must be added the empty columns, which are omitted from the table. Only 35 combinations were observed, out of a possible 257. This is due in part to the limitations of available materials; but this observation sheds indirect light on the high proportion of irregularities. Coordinative compounds occur less frequently

than determinative compounds; the system is therefore less productive, which may be conducive to less synchronic regularity and greater lexical diversification.

3.3. An independent set of facts: compound given names and terms of address

In Yongning, given names are of Tibetan origin; they are chosen by the Buddhist priests, on the basis of the date of birth. They consist of a combination of two names: /ji-tci-dum/ is made up of /ji-tci-/ and /dum#/; /dumdzur-tshu-l/ is a combination of /dumdzur/ and /tshu-l#. The tones of the second name are lowered to L in all cases, including those in which they could in theory combine without problem. For instance, /dumdzur/ and /tshu-l#/ could combine as /dumdzur-tshu-l#/; this would not violate conditions on well-formedness. The observed lowering of the last two syllables in the attested form, /dumdzur-tshu-l/, cannot be put down to the application of tone rules that apply throughout the system: this lowering is specific to given names – another instance of tone rule applying in a highly specific morphosyntactic context.

One of the two parts is used as the usual term of address; it may be the first or the second. For instance, the full given name of M18 is /tshur-tshu-l/, but people address him as /tshur/. The name that was bestowed on me by a priest of the Yongning monastery is /ji-su-ti-dol/; F4 chose to call me by the second part of that compound given name: /ti-dol/. This shows that speakers retain a clear awareness of the two parts of the name as distinct components.

The lowering to L of the second part of compound names is an exceptionless and productive rule. It only applies to given names, not to compound names made up of a term of address and a two-syllable given name. For instance, a woman named /ki-zo#/ may be addressed as /ə-mi-ki-zo#/ (“Mother ki-zo#, Aunt ki-zo#”) by her nephews and nieces; this term of address is not realized as /*ə-mi-ki-zo#/, as would be the case if it were treated in the same way as compound given names. As another example, the full name of F4’s grandmother was /dumdzur-pv-lhul/; her siblings addressed her as /pv-lhul/, using the second part of the given name, and her nephews and nieces, as well as other persons from the village, addressed her respectfully as “Mother /pv-lhul/” (which could also be translated as “Aunt /pv-lhul/”), /ə-mi-pv-lhul/. The lowering of the last

syllable is due to the prohibition of tonal troughs such as *M.M.L.M within a tone group (Rule xyz).

4. Conclusion about compound nouns

The tone patterns of compounds present a complex picture. On the one hand, about half the patterns can be explained straightforwardly as the simple concatenation of the two input tones, followed by application of the general rules governing the adjustment of successive tones within a tone group (§xyz). On the other hand, it was not found possible to capture the other half of the patterns by means of a set of rules.

At this point, it may be useful to speculate in the abstract about possible ways in which the tones of the determiner and head could combine. The simplest theoretical possibility would consist in having no tone change at all in compounds. Such is the case in numerous languages, including Naxi and Sinitic languages, showing that tone change is not necessary to signal compounding.

Another possibility would consist in complete neutralization of tonal oppositions on the determiner or the head. In the neighbouring language Shixing (Chirkova and Michaud 2009), only the tone of the determiner expresses itself, i.e. all tonal oppositions on the head are neutralized.

In Na, a similar state of affairs would be observed if simple concatenation of the input tones were generalized to all combinations. Under that configuration, the tone of the determiner would express itself first, and given the limitations on tone sequences within a tone group (summarized as Rules xyz: see Chapter xyz), this would leave little room for the tone of the head to express itself. H tones of the lexical categories #H, H\$, MH#, LM+MH#, LM+#H and H# have a propensity to associate towards the end of the tone group, so that they would preclude the expression of any other tone on the compound. Likewise, the L tones of the lexical categories L and L# would spread rightward all the way to the end of the compound noun. Basically, the tone of the head could only express itself when the determiner has M tone: M+L would yield °L, M+#H would yield #H, and so on.

The example of Shixing shows that it is possible to find such neutralizations in a language where tonal oppositions have a high functional yield: the nine tonal combinations among nouns in Shixing boil down to three patterns on compounds. The existence of more lexical tones

in Yongning Na may explain in part why such massive neutralization did not take place in this language. The state of affairs found in Na is much more complex and delicate: when the determiner carries #H, H\$ or MH#, the H part of the tone does show a propensity to associate to a following syllable within the compound, but it tends to remain close to the position that it had in the original noun, and the nature of its anchoring is sometimes modified in compounding. A case in point is tone H\$, which yields H\$, #H°, #H or H#° (with a range of different modes of association) depending on the tone of the head.

The complexity of the state of affairs in Na arguably sheds light on the considerable diversity of patterns: from one dialect to the next, and even between different speakers from the same village (not to mention the existence of variants within a single idiolect). A few compounds happen to carry the same tone sequence as would the simple juxtaposition of their constituting elements. Most carry a tone pattern that reflects their status as compounds; among these, the nature of the compound (determinative or coordinative) can further be identified in a few cases, whereas in the others it must be arrived at on the basis of other types of information, in particular semantic information.

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Notes

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Chapter 5

The tonal behaviour of classifiers in association with numerals, demonstratives and nouns

A classifier is “a type of limited noun that occurs only after numerals (...), and whose selection is determined by a preceding (overt or implicit) noun” (Matisoff 1973, 88). Classifiers are dealt with in a chapter of their own in view of their great importance in the language, and of the complexity of their tone patterns. The bulk of the chapter (§1) deals with the tonal behaviour of classifiers in association with numerals. Classifiers also associate with demonstratives, however (§2). In turn, numeral-plus-classifier or demonstrative-plus-classifier phrases may interact tonally with a preceding noun (§3).

1. Numeral-plus-classifier phrases¹

Within the small group of Naish languages, tonal alternations in numeral-plus-classifier phrases are vestigial in Naxi (as spoken in the plain of Lijiang), limited in Laze, and ubiquitous in Yongning Na. As a first sample, consider the diversity of tones found on classifiers in: /**ni**-**ni**/ ‘two days’, /**so**-**ni**/ ‘three days’, /**zy**-**ni**/ ‘four days’; and: /**ni**-**k^hy**-**l**/ ‘two years’, /**so**-**k^hy**-**l**/ ‘three years’, /**zy**-**k^hy**-**l**/ ‘four years’. This section proposes a complete synchronic description and analysis.¹

1.1. Elicitation procedures

For each noun in the vocabulary list collected in the course of fieldwork, a note was made of the classifiers typically associated with the noun (following the example of E. Henderson’s dictionary of Bwe Karen [1997]). This obviously does not capture the full range of stylistic possibilities in the choice of classifiers, which are best studied from their actual use: “a noun can be accompanied by various classifiers depending on context, so that it

¹ An earlier version of this section was published as a book chapter (Michaud 2013).

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may not be adequate to describe one of those as fundamental at a lexical level” (François 2000, 167, my translation).

To the list of classifiers obtained through lexical elicitation were added measure words (inch, armspan, heap...) and time units (day, month, year...). The term ‘classifier’ is understood here in the syntactic sense of: any noun that may appear directly after a numeral. Table 1 presents one example of each of the tone categories brought out for monosyllabic classifiers. Disyllabic classifiers will be dealt with separately in §1.4.

Table 1. One example of each of the tonal categories of classifiers

classifier	tone	description: classifier for...
ɖwæɭ	H1	steps (of stairs)
niɭ	H2	day
hãɭ	MH1	nights
kɣɭ	MH2	humans (plural)
naɭ	M1	tools
dziɭ	M2	pairs of non-separable objects, e.g. shoes
dzeɭ	L1	pairs of separable objects, e.g. pots, bottles
dziɭ	L2	trees, bamboo
zyɭ	L3	lines/patterns (in weaving or drawing)

Establishing the underlying tonal categories was not a straightforward task, because the tone of the classifier is affected by the numeral with which it is associated, witness the examples cited above: /ɖwɔɭ-niɭ/ ‘one day’, /niɭ-niɭ/ ‘two days’, /soɭ-niɭɭ/ ‘three days’, /zyɭ-niɭɭ/ ‘four days’; /ɖwɔɭ-kʰɣɭɭ/ ‘one year’, /niɭ-kʰɣɭɭ/ ‘two years’, /soɭ-kʰɣɭɭ/ ‘three years’, /zyɭ-kʰɣɭɭ/ ‘four years’. The first step consisted of conducting systematic elicitation, to find out how many tonal categories there were. A first data set was elicited in 2009, covering the range of numerals from 1 to 30, and a second set in 2011, covering the range from 1 to 100 and including more classifiers.

Elicitation yielded less than fully consistent results, due in part to the unusual nature of the counting task for the consultant. Although familiar with the process of linguistic elicitation, she easily became confused when counting all the way from 1 to 30 or 100. One and the same combination was realized in different ways during different elicitation sessions. When such discrepancies were pointed out to the consultant, she would identify one pattern as correct and reject the others as mistaken. However, these *a posteriori* judgments also wavered: a variant that had been brushed aside as

mistaken would come up again in a later session, and the consultant would then insist that it was correct. Initially, I wrongly assumed that only one tone pattern could be correct: it gradually became clear that there exist two variants for some of the phrases. For instance, the association of ‘47’ with the classifier for round objects can be realized either as /zy-tsh^hiɣu-l-lu/ or as /zy-tsh^hiɣu-l-lu/. (Variants like this one are discussed in Section 5.1; to preview the result of analysis: in the first variant, the phrase is parsed into two tone groups, whereas in the second, it is parsed as a single tone group.) Taking into account these two factors – that occasional mistakes are not uncommon in systematic elicitation, and that two variants can both be correct –, a comprehensive description could finally be arrived at.

The entire set of transcribed recordings is available online, with both a surface-phonological transcription and an indication of the underlying tonal pattern. Some technical details are presented in the next paragraphs.

1.2. Recordings

In 2009 the recordings were in stereo, collecting the signal from two microphones: a head-mounted Sennheiser HSP 2, and an AKG C-900. In 2011, an electroglottographic signal was collected simultaneously with the audio from the head-mounted microphone. The electroglottographic signal allows for a high-precision measurement of the voice’s fundamental frequency, as well as of other glottal parameters (about electroglottography, see the initial report of the invention: Fabre 1957; a synthesis: Baken 1992; some caveats: Orlikoff 1998; discussions about parameters that can be measured: Henrich et al. 2004; Michaud 2004; and applications to the study of specific linguistic issues, e.g. Mazaudon et Michaud 2008; Brunelle, Nguyễn Khắc Hùng, et Nguyễn Duy Dương 2010).

A total of 2,810 numeral-plus-classifier phrases were recorded, divided into 41 files, 28 of which have an electroglottographic component. In the recordings that extend from 1 to 100, the intervals [50..59] and [80..89] were not recorded, because previous elicitation had shown that their tone patterns were identical with those of [40..49] and [60..69], respectively, and shortening the list of numerals reduced consultant fatigue.

The entire set is available online from the Pangloss collection (about which see Michailovsky, Michaud, et Guillaume 2011), synchronized with transcriptions in English, Chinese and French. The current address is http://lacito.vjf.cnrs.fr/archivage/index_en.htm; the Yongning Na data can be accessed directly from

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http://lacito.vjf.cnrs.fr/archivage/languages/Na_en.htm (see Figures 1 and 2). These documents are perennially archived and will continue to be accessible even when the above addresses eventually change.

No amount of continuous speech would be enough to obtain all the numeral-plus-classifier combinations from 1 to 100, hence the choice to resort to systematic elicitation. However, some of the combinations are attested in the narratives with transcriptions, glosses and translations that are also available online from the Pangloss collection.

1.3. Results

A summary of all the results is presented in Table 2, which contains, in tightly packed form, the information necessary to generate the surface-phonological tone patterns of all numeral-plus-classifier phrases in Yongning Na. The mass of information presented in this table may seem staggering; were it not for the clear evidence from recorded data, one could suspect that this multiplicity of tone patterns is an artefact of elicitation procedures.

Variants are separated by a slash (/). For typographical reasons, the table is divided into two halves: the H and MH tones (H1, H2, MH1 and MH2) in a first table, and the M and L tones (M1, M2, L1, L2 and L3) in a second table.

Table 2. The underlying tone patterns of the nine categories of numeral-plus-classifier phrases, for all numerals from 1 to 100. Part 1: H and MH tones.

	H1	H2	MH1	MH2
1	H\$	H\$	MH#	MH#
2	H\$	H\$	MH#	MH#
3	L	L	L	L
4	#H	#H	L#	L
5	#H	#H	L#	L
6	H\$	H\$	H#	H\$
7	#H	#H	MH#	MH#
8	H\$	H\$	H#	H\$
9	#H	#H	L#	L
10	L	L	L	L
11	L	L	L	L
12	L	L	L	L
13	L	L	L	L
14	L+H\$	L	L+H#	L+H#

15	L+H\$	L	L+H#	L+H#
16	L+H\$	L	L+H#	L+H#
17	L	L	L	L
18	L+H\$	L	L+H#	L+H#
19	L+H\$	L	L+H#	L+H#
20	#H	#H	MH#	MH#
21	H\$	H\$	MH#	MH#
22	H\$	#H	MH#	MH#
23	°L	°L	°L	°L
24	#H	#H	°L#	°L
25	#H	#H	°L#	°L
26	H\$	H\$	H#	H\$
27	#H	#H	MH#	MH#
28	H\$	H\$	H#	H\$
29	#H	#H	°L#	°L
30	#H	#H	MH#	MH#
31	H\$	H\$	MH#	MH#
32	H\$	#H	MH#	MH#
33	°L	°L	°L	°L
34	#H	#H	°L#	°L
35	#H	#H	°L#	°L
36	H\$	H\$	H#	H\$
37	#H	#H	MH#	MH#
38	H\$	H\$	H#	H\$
39	#H/°L	#H	°L#	°L
40	L#°	L#°	L#°	L#°
41	L#°H\$ / L#°	L#°H\$ / L#°	L#°MH# / L#°	L#°MH#
42	L#°H\$ / L#°	L#°#H / L#°	L#°MH# / L#°	L#°MH#
43	L#°L	L#°L / L#°	L#°L	L#°L
44	L#°#H / L#°	L#°#H / L#°	L#°L#	L#°L
45	L#°#H / L#°	L#°#H / L#°	L#°L#	L#°L
46	L#°H\$	L#°H\$	L#°H#	L#°H\$
47	L#°#H	L#°#H	L#°MH#	L#°MH#
48	L#°H\$	L#°H\$	L#°H#	L#°H\$
49	L#°#H / L#°L	L#°#H / L#°	L#°L#	L#°L
50	L#°	L#°	L#°	L#°
51	L#°H\$ / L#°	L#°H\$ / L#°	L#°MH / L#°	L#°MH#
52	L#°H\$ / L#°	L#°#H / L#°	L#°MH / L#°	L#°MH#
53	L#°	L#°	L#°L	L#°L

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54	L#°#H / L#°	L#°#H / L#°	L#°L#	L#°L
55	L#°#H / L#°	L#°#H / L#°	L#°L#	L#°L
56	L#°H\$	L#°H\$	L#°H#	L#°H\$
57	L#°#H	L#°#H	L#°MH#	L#°MH#
58	L#°H\$	L#°H\$	L#°H#	L#°H\$
59	L#°#H / L#°	L#°#H / L#°	L#°L#	L#°L
60	LM°H\$	LM°H\$	LM°H#	LM°#H
61	LM°H\$	LM°H\$	LM°H#	LM°#H
62	LM°H\$ / LM°#H	LM°#H	LM°H#	LM°H#
63	LM°H\$ / LM°L	LM°H\$ / LM°L	LM°H#	LM°H#
64	LM°#H	LM°#H	LM°H#	LM°H#
65	LM°#H	LM°#H	LM°H#	LM°H#
66	LM°H\$	LM°H\$	LM°H#	LM°H#
67	LM°#H	LM°#H	LM°H#	LM°H#
68	LM°H\$	LM°H\$	LM°H#	LM°H#
69	LM°#H / LM°L	LM°L	LM°H#	LM°H#
70	L#°	L#°	L#°	L#°
71	L#°H\$ / L#°	L#°H\$	L#°MH# / L#°	L#°MH#
72	L#°H\$ / L#°	L#°#H	L#°MH# / L#°	L#°MH#
73	L#°L	L#°L	L#°L	L#°L
74	L#°#H	L#°#H	L#°MH# / L#°	L#°L
75	L#°#H	L#°#H	L#°MH# / L#°	L#°L
76	L#°H\$	L#°H\$	L#°H# / L#°	L#°H#
77	L#°#H	L#°#H	L#°MH# / L#°	L#°MH#
78	L#°H\$	L#°H\$	L#°H# / L#°	L#°H#
79	L#°#H / L#°L	L#°#H	L#°L#	L#°L
80	LM°H\$	LM°H\$	LM°H#	LM°H#
81	LM°H\$	LM°H\$	LM°H#	LM°H#
82	LM°H\$	LM°#H	LM°H#	LM°H#
83	LM°H\$	LM°H\$ / LM°L	LM°H#	LM°H#
84	LM°#H	LM°H\$	LM°H#	LM°H#
85	LM°#H	LM°#H	LM°H#	LM°H#
86	LM°H\$	LM°H\$	LM°H#	LM°H#
87	LM°#H	LM°#H	LM°H#	LM°H#
88	LM°H\$	LM°H\$	LM°H#	LM°H#
89	LM°#H	LM°#H	LM°H#	LM°H#
90	L#°	L#°	L#°	L#°
91	L#°H\$	L#°H\$	L#°MH# / L#°	L#°MH# / L#°

92	L#°H\$	L#°#H	L#°MH# / L#°	L#°MH# / L#°
93	L#°L	L#°L	L#°L	L#°L
94	L#°#H	L#°#H	L#°L# / L#°	L#°L
95	L#°#H	L#°#H	L#°L# / L#°	L#°L
96	L#°H\$	L#°H\$	L#°H# / L#°	L#°H# / L#°
97	L#°#H	L#°#H	L#°MH# / L#°	L#°MH# / L#°
98	L#°H\$	L#°H\$	L#°H# / L#°	L#°H# / L#°
99	L#°L	L#°#H	L#°L# / L#°	L#°L
100	#H	#H	MH#	MH#

Part 2: M and L tones.

	M1	M2	L1	L2	L3
1	M	M	L#	L#	L#
2	M	M	L#	L#	L#
3	M	M	L	M	M
4	L	L	H#	H#	H#
5	L	L	H#	H#	H#
6	H#	H\$	H#	H#	H#
7	M	M	L#	L#	L#
8	H#	H\$	H#	H#	H#
9	L	L	H#	H# / L#	H#
10	M	M	L	M	L
11	M	M	L#	L#	L#
12	M	M	L#	L#	L#
13	M	M	L#	L#	L#
14	L+H#	L	L+H#	L+H#	L+H#
15	L+H#	L	L+H#	L+H#	L+H#
16	L+H#	L	L+H#	L+H#	L+H#
17	M	M	L#	L#	L#
18	L+H#	L	L+H#	L+H#	L+H#
19	L+H#	L	L+H#	L+H#	L+H#
20	M	M	°L	°L	°L
21	M	M	°L#	°L#	°L#
22	M	M	°L#	°L#	°L#
23	°L / M	M / °L	°L	°L	°L
24	°L	°L	H#	H#	H#
25	°L	°L	H#	H#	H#
26	H#	H\$	H#	H#	H#
27	M	M	°L#	°L#	°L#

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28	H#	H\$	H#	H#	H#
29	°L	°L	H#	°L# / H#	H#
30	M	M	°L#	°L	°L#
31	M	M	°L#	°L#	°L#
32	M	M	°L#	°L#	°L#
33	°L	°L	°L	°L	°L
34	°L	°L	H#	H#	H#
35	°L	°L	H#	H#	H#
36	H#	H\$	H#	H#	H#
37	M	L	°L#	°L#	°L#
38	H#	H\$	H#	H#	H#
39	°L	°L	H# / °L#	H# / °L#	H# / °L#
40	L#°	L#°	L#°	L#°	L#°
41	L#°	L#°M / L#°	L#°L# / L#°	L#°L# / L#°	L#°L# / L#°
42	L#°	L#°M / L#°	L#°L# / L#°	L#°L# / L#°	L#°L# / L#°
43	L#°	L#°M / L#°	L#°M / L#°L	L#°M / L#°	L#°M / L#°
44	L#°H# / L#°	L#°	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
45	L#°H# / L#°	L#°	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
46	L#°H# / L#°	L#°H\$ / L#°	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
47	L#°M / L#°	L#°M / L#°	L#°L# / L#°	L#°L# / L#°	L#°L# / L#°
48	L#°H# / L#°	L#°H\$ / L#°	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
49	L#°H# / L#°	L#°L	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
50	L#°	L#°	L#°	L#°	L#°
51	L#°	L#°M / L#°	L#°L# / L#°	L#°L# / L#°	L#°L# / L#°
52	L#°	L#°M / L#°	L#°L# / L#°	L#°L# / L#°	L#°L# / L#°
53	L#°	L#°M / L#°	L#°M / L#°L	L#°M / L#°	L#°M / L#°
54	L#°H# / L#°	L#°	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
55	L#°H# / L#°	L#°	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
56	L#°H# / L#°	L#°H\$ / L#°	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
57	L#°M / L#°	L#°M / L#°	L#°L# / L#°	L#°L# / L#°	L#°L# / L#°
58	L#°H# / L#°	L#°H\$ / L#°	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
59	L#°H# / L#°	L#°L	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
60	LM°H#	LM°H\$	LM°H#	LM°H#	LM°H#
61	LM°H# / L+MH#°M	LM°H\$	LM°H#	LM°H#	LM°H#
62	LM°H# / L+MH#°M	LM°H\$	LM°H#	LM°H#	LM°H#
63	LM°H# / L+MH#°M	LM°H\$	LM°H#	LM°H#	LM°H#

64	LM°H# / L+MH#°L	LM°H\$	LM°H#	LM°H#	LM°H#
65	LM°H# / L+MH#°L	LM°H\$	LM°H#	LM°H#	LM°H#
66	LM°H#	LM°H\$	LM°H#	LM°H#	LM°H#
67	LM°H# / L+MH#°M	LM°#H	LM°H#	LM°H#	LM°H#
68	LM°H#	LM°H\$	LM°H#	LM°H#	LM°H#
69	LM°H# / L+MH#°L	LM°H\$ / LM°L	LM°H#	LM°H#	LM°H#
70	L#°	L#°	L#°	L#°	L#°
71	L#° / L#°M	L#°M / L#°	L#°L# / L#°	L#°L# / L#°	L#°L# / L#°
72	L#° / L#°M	L#°M / L#°	L#°L# / L#°	L#°L# / L#°	L#°L# / L#°
73	L#° / L#°M	L#°M / L#°	L#°L	L#°M / L#°	L#°M / L#°
74	L#° / L#°H#	L#°L	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
75	L#° / L#°H#	L#°L	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
76	L#°H# / L#°	L#°H\$ / L#°	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
77	L#°M / L#°	L#°M / L#°	L#°L# / L#°	L#°L# / L#°	L#°L# / L#°
78	L#°H# / L#°	L#°H\$ / L#°	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
79	L#°L / L#°H#	L#°L	L#°H# / L#°	L#°H# / L#°	L#°H# / L#°
80	LM°H#	LM°H\$	LM°H#	LM°H#	LM°H#
81	LM°H# / L+MH#°M	LM°H\$	LM°H#	LM°H#	LM°H#
82	LM°H# / L+MH#°M	LM°H\$	LM°H#	LM°H#	LM°H#
83	LM°H# / L+MH#°M	LM°H\$	LM°H#	LM°H#	LM°H#
84	LM°H# / L+MH#°L	LM°H\$	LM°H#	LM°H#	LM°H#
85	LM°H# / L+MH#°L	LM°H\$	LM°H#	LM°H#	LM°H#
86	LM°H#	LM°H\$	LM°H#	LM°H#	LM°H#
87	LM°H# / L+MH#°M	LM°#H	LM°H#	LM°H#	LM°H#
88	LM°H#	LM°H\$	LM°H#	LM°H#	LM°H#
89	LM°H# / L+MH#°L	LM°H\$ / LM°L	LM°H#	LM°H#	LM°H#
90	L#° / L#°	L#°	L#°	L#°	L#°

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91	L#°M / L#°	L#°M / L#°	L#°L# / L#°	L#°L# / L#°	L#°L#
92	L#°M / L#°	L#°M / L#°	L#°L# / L#°	L#°L# / L#°	L#°L#
93	L#°M / L#°	L#°M / L#°	L#°M / L#°	L#°M / L#°	L#°M / L#°
94	L#°L / L#°H#	L#°	L#°H# / L#°	L#°H# / L#°	L#°H#
95	L#°L / L#°H#	L#°	L#°H# / L#°	L#°H# / L#°	L#°H#
96	L#°H# / L#°	L#°H\$ / L#°	L#°H#	L#°H# / L#°	L#°H#
97	L#°M / L#°	L#°M / L#°	L#°L# / L#°	L#°L# / L#°	L#°L#
98	L#°H# / L#°	L#°H\$ / L#°	L#°H#	L#°H# / L#°	L#°H#
99	L#°L / L#°H#	L#°L	L#°H#	L#°H# / L#°	L#°H# / L#°
100	M	M	L#	L#	L#

Numeral-plus-classifier phrases typically constitute one single phonological group – although speakers can choose to split them into two groups for expressive (emphatic) purposes, as will be discussed at the beginning of §xyz. The juncture indicated by ° is internal to the phonological group: it does not separate two phonological groups.

The items in Table 2 that begin with ° do not have any specified tone on their first portion; that portion receives a Mid tone by default. Thus, the phrase ‘33 days’ has a °L tone pattern: a Low tone that associates after the juncture, yielding /...soL^{hi}ni/. Since Low tones do not spread regressively (‘right-to-left’), the first portion receives M by default (/soL^{hi}i.../), resulting in the final output /soL^{hi}iLsoL^{hi}ni/.

Likewise, the items that end with ° do not have any specified tone on their second portion. That portion receives its tones by the application of the tonal rules that govern tonal groups in Yongning Na. For instance, ‘40 years’ has the tone pattern L#°: tone L# (a final L tone) associates to the first half of the phrase, yielding /zy^{hi}tsiL.../, then /zy^{hi}tsiL.../. As already mentioned, tones do not spread leftward; the first syllable receives a Mid tone by default. At this point a tonal rule applies (see §xyz for more details): rule xyz “”. This amounts to saying that a tone cannot be surrounded by higher tones within a phonological group: there are no | M_LM | sequences, nor are there | H_MH |, | H_LM |, | M_LM^H |, and so on. The only possible tone on the second portion of the phrase is therefore L. The final output is /zy^{hi}tsiL^{hi}k^{hi}γ/.

1.3.1. How the tonal categories were brought out and labelled

All of the classifiers in Table 1 fall into one of nine tonal categories: the nine data columns of Table 2, based on their tonal behaviour when combined with numbers. In turn, these categories were grouped into four sets on the basis of their similarities. For instance, H1 and H2 are identical except for fourteen of the numerals: {[14..16], [18..19], 22, 32, 42, 52, 62, 72, 82, 92, 99}. Finally, labels were chosen for these four sets and the nine subcategories, as explained below.

Decisive evidence for the analysis of the tones of classifiers could, in principle, come from those classifiers that correspond transparently to a noun (or verb). However, only few such classifiers were observed, and the tonal correspondences between lexical word and classifier are not straightforward. The classifier for blows is /da˥˩/; under the hypothesis made here (that its tonal category is MH), the correspondence with the verb /da˥˩/ ‘to hit, to strike’ looks transparent, though its affiliation to the subcategory MH2 within MH still requires explanation. ‘Mountain, hill’ is /ɬwɿ˥˩/ (M tone); as a classifier it yields /ɬwɿ˥˩/ ‘heap(s) of’ (M1 category); ‘beam’, /dzu˥˩/, has /dzu˥˩/ (category H1) as its self-classifier. Taking these three examples, it might appear that the tone category of a classifier is identical to that of its corresponding noun or verb.

Other examples, however, do not exhibit such simple correspondences. The classifier for marketplaces and cities is /dzu˥˩/ whereas the noun ‘city’ has a H tone: /dzu˥˩/. A third tonal correspondence for H-tone nouns is exemplified by /kwɿ˥˩/ ‘star’, which yields /kwɿ˥˩/ (M2 category) as a self-classifier. ‘Bowl’ is /qʰwɿ˥˩/ (LM tone), whereas as a classifier it yields /qʰwɿ˥˩/ ‘bowlful’ (MH1 category).

Another source of evidence could be the treatment of Chinese borrowings: it can be assumed that the tone subcategories used to accommodate recent borrowings are productive in synchrony. However, only one borrowing was observed: /tɕi˥˩/ for ‘pound (weight unit)’. As expected, its tonal category is MH1, i.e. the majority category for classifiers with a MH tone, but it would be unreasonable to draw general conclusions from this isolated example.

In the absence of decisive evidence from either of these two sources, the choice of labels for the nine categories brought out by distributional analysis was guided by structural hints. The tone of the classifiers after ‘6’ and ‘8’ is not highly informative, since almost all tonal oppositions are neutralized in this context (the only tones that are observed are H# and H\$).

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Likewise, in phrases involving '3' and '10', only two patterns are observed. After '4' and '5', four groups can be distinguished; but if these patterns were indicative of the classifiers' lexical tone, the system would only contain two High tones (#H and H#) and two L tones (L# and L). There would be no Mid tones, and no contours. This would be completely unlike the lexical tones of the other monosyllabic nouns found in Yongning Na, which consist of: H, M, L, and two types of rising contours, analyzed as MH and LM.

On the other hand, the tone patterns in association with the numerals '1' and '2' make good sense as labels for tonal categories: these four patterns are H, MH, M and L, all of which exist as lexical tones for nouns. They are therefore provisionally adopted, adding a numeral to distinguish the subcategories (two for H, MH and M, and three for L), by order of decreasing frequency (e.g. there are more classifiers in category M1 than M2). Another option would be to use a larger part of the range of tone labels used for nouns, e.g. using the labels L, LM and LH instead of L1, L2 and L3; but in the absence of guiding evidence, the assignment of these three labels would have been random.

The labels adopted here make sense under the (admittedly simplistic) assumption that the contribution made by the tone of the classifier will be reflected statistically in the tone pattern of the numeral-plus-classifier phrase. Averaging over the entire range of tone patterns from the number 1 to the number 100, the categories that have a High tone after '1' and '2' (labelled H1 and H2 in Table 2) are also those with the highest proportion of H tones (either on their own: H#, #H, H\$, or as part of a MH or MH# contour) and the lowest proportion of L tones. Conversely, the categories that have a Low tone after '1' and '2' (labelled L1, L2 and L3 in Table 2) have the lowest proportion of H tones and the highest of L tones. The other two subgroups (M1 and M2; and MH1 and MH2) are between these two extremes; again as predicted, M1 and M2 have a higher proportion of M tones, and a lower proportion of H tones, than MH1 and MH2. These rule-of-thumb comparisons, which do not carry demonstrative value, are simply mentioned to convey a feel for the overall outlook of the data. Another indirect way of approaching these data consists of examining the occasional mistakes made by the consultant: this is one of the benefits of having an extensive set of recordings at hand.

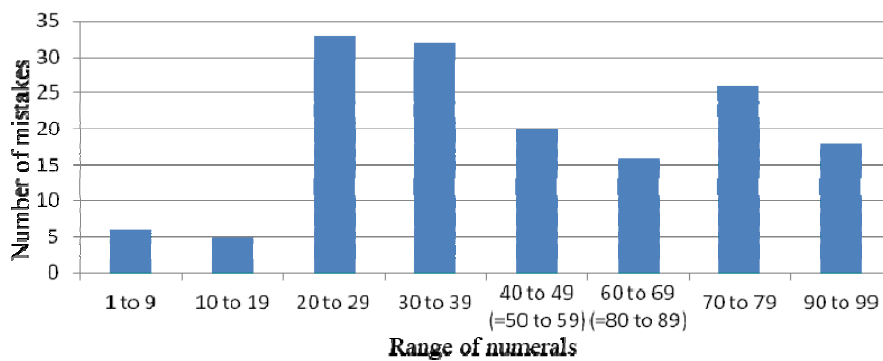
1.3.2. About mistaken realizations in the recordings

As was mentioned earlier, the task of realizing long sequences of numeral-plus-classifier phrases was challenging for the consultant. Among the 2,810 tokens, 7% have a mistaken tone pattern:² a tone pattern which the consultant (F4) consistently judged to be incorrect (a tonal slip of the tongue) when we returned to the data after recording sessions.

These mistakes reflect in part the phonological complexity of the tone patterns at issue. The notion that mistakes may provide insights about language dates back at least to Henri Frei's *Grammar of Mistakes* [1929] (see also Fromkin 1973 and Rossi and Peter-Defare 1998, among others). The usefulness of speech errors and word games to gain insights into tonal systems was shown by Hombert (1986, 180–181): speakers of Mandarin, Cantonese, Minnan (Taiwanese) and Thai tend to move the tones with the syllables when changing a $C_1V_1C_2V_2$ sequence into $C_1V_2C_2V_1$ or $C_2V_2C_1V_1$, whereas speakers of Bakwiri, Dschang-Bamileke and Kru tend to leave tone patterns unchanged; see also Wan and Jaeger (1998) on Mandarin.

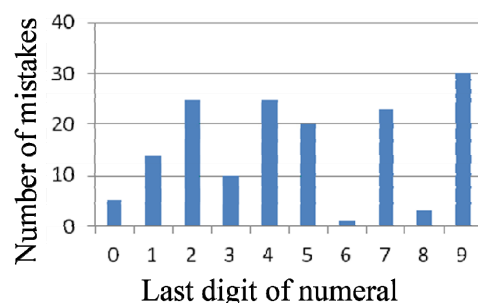
Table 3 shows the distribution of mistakes as a factor of the range of tens: how many of the observed mistakes concern numerals between 1 and 9 (leftmost bar), 10 and 19 (second bar), etc. Table 4 shows the distribution of mistakes as a factor of the last digit (units): how many mistakes concern numbers ending in '1', in '2', etc.

Table 3. Number of mistakes in the recorded numeral-plus-classifier phrases as a factor of the range of tens.



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Table 4. Number of mistakes in the recorded numeral-plus-classifier phrases as a function of the last digit (units).



The data are not symmetrical enough for a full-fledged statistical treatment. In particular, (i) there are more data for some tonal categories than others, (ii) some combinations have several repetitions, and (iii) there are slightly more data in the range [1..10] than for higher numerals.

1.3.3. *About variants of tone patterns*

No observed numeral-plus-classifier phrase has more than two acceptable variants for its tone pattern. Many of the variants can be explained in light of general rules which hold within a tone group in Yongning Na: if the numeral-plus-classifier phrase is treated as one single tone group, then these rules apply, and modify the tone pattern.

For instance, in the case of ‘44’ plus the classifier for tools, /na/ (category M1), the phrase /zy-tsh^hi|zy-l-na/ is not a well-formed phonological group, since it is not in keeping with rule (xyziii): the L tone on /ts^hi/ is surrounded by higher tones. This syntactic phrase is therefore to be analyzed as consisting of two phonological groups: /zy-tsh^hi | zy-l-na/ (tone pattern: L#°H#). If this phrase were treated as one single phonological group, the tones of its last two syllables would be lowered to L. This is precisely what happens in the tonal variant that is attested for this phrase: /zy-tsh^hi|zy-l-na/ (tone pattern: L#°). The two variants can therefore be described as (i) a form consisting of two phonological groups, and (ii) a simplified form, whose tonal pattern results straightforwardly from its treatment as a single phonological group.

The same applies to all tonal patterns in the range [40..59], [70..79] and [90..99], since the first two syllables (corresponding to ‘40’, ‘50’, ‘70’ and ‘90’ respectively) have a Mid-plus-Low pattern. This pattern precludes any tone other than L on the following syllables within the same phonological

group (since that would not be in keeping with rule (xyziii) above). One would therefore expect all of these combinations to have two variants. This holds true as a general rule: when the consultant indicated a complex form and I tried substituting a simplified form, that form was never rejected by the consultant. On the other hand, for some combinations the simpler form is the only acceptable one: for instance, for ‘44’ with a classifier of category M2, such as /**lɔɔ**/ (the classifier for round objects), one has to say /**zy**-**ts^hi**-**zy**-**lɔɔ**/ (tone pattern: L#°).

Supposing, on the analogy of category M1, that /***zy**-**ts^hi** | **zy**-**lɔɔ**/ was acceptable in an earlier state of the language, it must be supposed to have fallen out of use; this is in keeping with the expected preference for simpler forms in language evolution. For category M1, where there are currently two variants in common use, the consultant’s intuition is that the complex variant, /**zy**-**ts^hi** | **zy**-**na**/, is somewhat “slow” and “clumsy”: in discourse, it conveys special emphasis and is only appropriate as part of an expressive strategy to draw attention to the figure at issue. To sum up, the integration of numeral-plus-classifier phrases into one single phonological group is the general rule.

Interestingly, when a phrase ends in two Low-tone syllables, it is possible to test whether these Low tones result from the levelling down of originally non-Low tones (as in the case of /**zy**-**ts^hi**-**zy**-**na**/, mentioned above) or reflect an underlying Low tone. In the latter case, it is possible to divide the phrase into two phonological groups; the second group, having an underlying L tone, receives a postlexical final H tone, by the application of rule (xyzii). For example, ‘23 years’ (category MH1) can be realized either as /**ni**-**tsi**-**so**-**k^hy**/ or as /**ni**-**tsi** | **so**-**k^hy**/, revealing that its underlying tone pattern is M°L, whereas with the classifier for tools it would be incorrect to say /***zy**-**ts^hi** | **zy**-**na**/: the variant with a division into two groups is /**zy**-**ts^hi** | **zy**-**na**/, This explains neatly why the contour-creating final H tone is only allowed for some of the phrases. A device for forcing the division of the phrase into two phonological groups consists of inserting the syllable /**la**/, ‘and’, before the last digit: e.g. /**su**-**ts^hi**-**la** | **q^hy**-**ɛwɛ**/ ‘79 heaps’.

1.4. Disyllabic classifiers, and implications for the tones of numerals

Only a few disyllabic classifiers were observed. One is a reduplicated monosyllable: /**ts^he**-**ts^he**/ ‘the width of a room’. Others are nouns: /**ji**-**q^hv**#/ ‘bull’s horn’ can be used as a classifier, since bull horns were used to drink or to pour liquids, for instance to pour water into a pot. The

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noun ‘bull’s horn’ is in competition, in its use as a classifier, with another classifier referring specifically to hornfuls of liquids, /q^hv-t^hv-/, which is more commonly used than the noun. The classifier for strides (large steps) is disyllabic: /p^hɿ-ka-/. ‘Bottle’, /toɭbi#/, can be used as a noun: /toɭbi#/ | dɯɿ-lɯɿ/ ‘a bottle’, or as a classifier: /zɯɿ | dɯɿ-toɭbi/ ‘a bottle of wine’. The classifier for ladlefuls is /bvɿdzeɿ/, and that for handfuls (using both hands) is /loɭdziɿ/.

The disyllabic classifiers observed to date fall into one of two tonal classes: M and #H on the one hand, L and LM+#H on the other. Table 5 presents the data.

Table 5. *The tonal behaviour of disyllabic classifiers. Example words: /q^hv-t^h#/ ‘horn’ and /toɭbi#/ ‘bottle’*

tone of classifier →	M and #H		L and LM+#H	
numeral	example form	tone	example form	tone
1	dɯɿ-q ^h v-t ^h v#ɿ	#H	dɯɿ-toɭbiɿ	°L
2	niɿ-q ^h v-t ^h v#ɿ	#H	niɿ-toɭbiɿ	°L
3	soɿ-q ^h v-t ^h vɿɿ	L	soɿ-toɭbiɿɿ	L
4	zɯɿ-q ^h v-t ^h v#ɿ	#H	zɯɿ-toɭbiɿ	H#°
5	ŋwɿ-q ^h v-t ^h v#ɿ	#H	ŋwɿ-toɭbiɿ	H#°
6	q ^h vɿ-q ^h v-t ^h v#ɿ	#H	q ^h vɿ-toɭbiɿ	H#°
7	ʂwɿ-q ^h v-t ^h v#ɿ	#H	ʂwɿ-toɭbiɿ	°L
8	hõɿ-q ^h v-t ^h v#ɿ	#H	hõɿ-toɭbiɿ	H#°
9	gvɿ-q ^h v-t ^h v#ɿ	#H	gvɿ-toɭbiɿ	H#°
10	ts ^h eɿ-q ^h v-t ^h vɿɿ	L	ts ^h eɿ-toɭbiɿɿ	L

Overall, there is much less diversity of tones for disyllabic classifiers than for monosyllabic ones.

1.5. Conclusions

From the mass of information set out in this chapter, it is clear that the tone patterns of numeral-plus-classifier phrases encapsulate information not derived from synchronic rules. The system as presented in Table 2 is regular and productive, in that all the classifiers of a given tone category have the same tone patterns. As it lends itself straightforwardly to computer implementation, a simple Perl script was written (available from the author). It takes as its input the classifier’s tone category and segmental composition

and a numeral (or range of numerals) from 1 to 100. The data in Table 2 are stored within the script, allowing for the tone pattern to be recovered through table lookup. The surface-phonological tone pattern is then assigned to the phrase on the basis of the general principles governing tone assignment in Na (which are encoded into the script), such as that simple L and M tones attach to all the syllables within their domain, tone sequences attach to syllables left-to-right, and so on. For instance, providing as input the segments /na/, the tonal category M1, and the numeral '44', the script yields the following two variants: /zy^hts^hiJzy^hl-na/ (tone pattern: L#°H#) and /zy^hts^hiJzy^hl-na/ (tone pattern: L#°).

In the present version of the script, all of the information set out in Table 2 is encoded in full, specifying the tone patterns of 900 combinations (9 tone categories of classifiers times 100 numerals). This allows for straightforward table-lookup, but is uneconomical from the point of view of linguistic modelling. The addition of some rules could significantly reduce the number of combinations that need to be indicated. In particular, the tone patterns of [40..49] are identical with those of [50..59]; likewise for [60..69] and [80..89]. Numerals ending in '1' also have identical patterns with those ending in '2', with a few exceptions in category H2. The information provided for each subcategory (H1 and H2, M1 and M2, and so on) could also be simplified by considering one of the subcategories as the norm, and only supplying the forms for the other subcategories where they differ from that norm.

However, it is clear that even after this simplification task has been conducted, large numbers of tonal patterns will still need to be specified individually. For instance, neither H1 nor H2 can be considered as a simplified version of the other: while the systematic application of a L tone to all the phrases from '10' to '19' suggests that H2 is a simplified version of the patterns of H1, the presence of different tones after numerals ending in '1' and '2' is a complexity found for H2 and not for H1. The latter observation is a striking counterexample to the pan-Naish generalization that the numerals '1' and '2' always have the same tone patterns – a generalization which holds for Naxi and Laze, and for all the rest of the Na data. One case of idiosyncratic tone patterns was observed: /to/ 'armful' belongs to the H1 category, but the combination '11 armfuls' is realized as /ts^he^hl^hu^hl-to/ instead of the expected /ts^he^hl^hu^hl-to/.

2. Demonstrative-plus-classifier phrases

A demonstrative and a following classifier are always integrated into a single tone group. The elicitation procedure was similar to that used for numeral-plus-classifier phrases, and similar puzzles were encountered.

As explained in the previous section, the tonal categories of classifiers were established on the basis of their behaviour when combined with numerals. The nine categories are: H1 and H2; MH1 and MH2; M1 and M2; and L1, L2 and L3. As for the proximal demonstrative, /tɕʰu#/, and the distal demonstrative, /tʰv#/, they both carry lexical #H tone. The expectations were that, in demonstrative-plus-classifier phrases, (i) there would be no difference proximal and distal demonstrative, since they have the same lexical tone, and (ii) all classifiers within each of the nine tonal categories would have the same tonal behaviour.

The first prediction was verified: phrases containing /tɕʰu#/ ‘this’ and /tʰv#/ ‘that’ always have the same tonal behaviour. The second prediction, on the other hand, proved to be incorrect: some of the tonal classes for classifiers proved to be less than fully homogeneous. The account provided below starts out from the simplest cases, and progresses towards the category for which the greatest degree of divergence was found (category L3).

When combined with demonstratives, H1 and H2 behave in the same way, as do MH1 and MH2. This is the simplest part of the picture: the distinction between H1 and H2 is neutralized in this context, and the distinction between MH1 and MH2 is likewise neutralized. Categories M1 and M2 behave differently from each other, but each in a consistent and simple way, with only one possible pattern: demonstrative plus M1-tone classifier yields L#, e.g. /tʰvɪ-na/ (classifier for tools); demonstrative plus M2-tone classifier yields #H, e.g. /tʰvɪ-lu#/ (generic classifier).

Among Low tone categories of classifiers, L1 and L3 are relatively straightforward. All L1-tone classifiers have the same behaviour, allowing two variants: H# and H\$. Both variants are firmly attested; the speaker expresses a preference for the former, but this slight imbalance appears to be the same for all examples, suggesting that there does not exist any clear (lexicalized) preference for the one or the other in association with a specific classifier.

Category L2 is the most problematic. In the production data, there are three variants, H#, H\$ and MH#. But for some classifiers of this category (e.g. /miɪ₂/, the classifier for animals, and /kʰuɪ₂/, the classifier for long

objects), MH# is by far the most frequent pattern, with H\$ as an occasional variant, and H# rarely attested. For other classifiers (including /mi₂/, the classifier for animals, and /k^hu₂/, the classifier for long objects), H# and H\$ appear with comparable frequency, whereas MH# is seldom found.

When several variants are proposed by the investigator and the consultant is asked which ones are correct, a similar picture emerges: MH# is strongly preferred for some classifiers, with H\$ as an acceptable variant, whereas H# is dispreferred: either refused as incorrect, or judging it marginally acceptable only. For other classifiers, the preferred form is H#; tone H\$ is an acceptable variant; and tone MH# is not. Table 6 presents these two sets, provisionally labelled as ‘a’ and ‘b’.

Table 6. The two subcategories of L2-tone classifiers, based on their behaviour in association with demonstratives

type	tone pattern in association with demonstrative	form	classifier for
L2, type a	MH# most common H\$ attested H# dispreferred or refused	bo ₂ dv ₂ dzi ₂ jo ₂ k ^h u ₂ lo ₂ fi ₂ mi ₂ p ^h v ₂ t ^h y ₂ tɕ ^h i ₂ wɾ ₂ wo ₂	headdresses small groups trees ounces long objects valleys armspans animals fields sets of ten meals loads teams of oxen
L2, type b	H# most common H\$ attested MH# dispreferred or refused	pɾ ₂ po ₂ ɤo ₂ ɕu ₂ ts ^h e ₂ tɥ ₂	ladders, doors packs types, sorts times leaves large chunks

The consultant’s acceptance of variants fluctuated from session to session, but the distinction between subsets a and b was confirmed in the

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course of elicitation sessions in 2013 and 2014. Examples from the recorded texts provide evidence pointing in the same direction.

The tone patterns for all categories of classifiers are set out in Table 7, using the distal demonstrative, /t^hv#l/, as an example. (As mentioned above, the tone patterns for the proximal demonstrative, /t^sh^hu#l/, are the same.) The corresponding online recordings are “Demonstrative-plus-classifier phrases, I-III”.

Table 7. *The tone patterns of demonstrative-plus-classifier phrases*

tone pattern		example	
tone of CLF	tone of DEM+CLF phrase	classifier for	DEM+CLF phrase
H1, H2	H\$ / #H	chunks	t ^h v-l-k ^h wɿ/\$ / t ^h v-l-k ^h wɿ#l
MH1, MH2	L#	cattle	t ^h v-l-p ^h oɭ
M1	L#	tools	t ^h v-l-naɭ
M2	#H	generic	t ^h v-l-ɭu#l
L1	H# / H\$	quantities	t ^h v-l-mɿl / t ^h v-l-mɿ/\$
L2, type a	MH# / H\$	animals	t ^h v-l-miɭl / t ^h v-l-mi/\$
L2, type b	H# / H\$	doors	t ^h v-l-pɿl / t ^h v-l-pɿ/\$
L3	MH# / H# / H\$	plains	t ^h v-l-diɭl / t ^h v-l-di / t ^h v-l-di/\$

The ‘type a’ and ‘type b’ distinction among L2-tone classifiers constitutes an impressive extra complexity within the system. Category L2 is a subdivision within the L category of tones; its further division into types a and b constitutes a subdivision within a subdivision. From the point of view of phonological output, L2_b is identical with L1, but L2_a yields an output (MH# / H\$) which is not identical with any other within the system.

3. Tonal interactions between a noun and a following numeral-plus-classifier or demonstrative-plus-classifier phrase

sdf

sdf

	#H	MH#/H\$ (miɭ2, boɭ2)	MH# (k ^h uɭ2, dziɭ2)	MH#/H# (diɭ3)	#H/H\$ (H1)	H\$	L#	H#

4. General conclusion

The tone patterns of phrases containing classifiers are part of the language's irregular morphotonology: tone patterns which can be accounted for neither by sandhi nor regular morphotonological rules. Guillaume Jacques (p.c.) notes that irregular morphology in Na, as also in other Naish languages, as well as in Yi and Pumi, largely consists of irregular morphotonology. This system may appear staggeringly complex; these phrases are frequent in discourse, however, a factor which is known to favour the preservation of irregular morphology.

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¹ This chapter is a slightly reworked version of a research paper (Michaud 2013).

² This figure includes some items that were deleted from the sound files at an early stage of the study, before the principle of preserving the recordings unchanged was adopted.

Chapter 6

Combinations of nouns with grammatical words

This chapter deals with combinations of nouns with grammatical words. The discussion successively bears on possessive constructions containing pronouns; reduplication; affixes; and clitics.

1. Possessive constructions containing pronouns

Possessive constructions were already discussed in §xyz of Chapter xyz, where the behaviour of the various tonal classes of nouns when followed by the possessive /by/ served as a criterion for determining lexical tone classes. From a tonal point of view, pronouns constitute a separate set from nouns.

1.1. The 1st, 2nd and 3rd person pronouns

To build a possessive construction containing a pronoun, the possessive /by/ is generally used, as in (xyz1). The tone pattern is the following: /njɣt-bv/, /noɫ-bv/ and /tʂʰuɫ-bv/ for the 1st, 2nd and 3rd persons respectively.

(xyz1) əɭjiɫ-ʂuɭjiɫ, | njɣt-byɫ | zɰæɫ-tʂʰuɫ, | ŋwɣɫ-kɣɫ tʂæɫ | poɫ-huɫ-niɫ!

əɭjiɫ-ʂuɭjiɫ	njɣɫ	by	zɰæɫ	tʂʰuɫ	ŋwɣɫ	kɣɫ	tʂæɫ
in_the_past	1SG	POSS	horse	TOP	5	CLF	to_rob
poɫ		huɫ _c		-niɫ			
to_take_away		to_go.PST		CERT_STR(COP)			

‘Long ago, five of my family’s horses were stolen!’ Literally: ‘Long ago, my horses (=my family’s horses), five were stolen and taken away!’ (Caravans.183)

An interesting complication is that there are seemingly two variants for the 3rd-person pronoun: /tʂʰuɫ-bvɫ/ and /tʂʰuɫ-bvɫ/ are both correct. These are not tonal variants, however: they have different meanings. The latter, /tʂʰuɫ-bvɫ/, is a reduced form of /tʂʰuɫ=ɫɫ-bvɫ/, where /=ɫɫ/ is the COLLECTIVE. Thus, /tʂʰuɫ-bvɫ/ means ‘their’, whereas /tʂʰuɫ-bvɫ/ simply

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means ‘his’. Ellipsis of the COLLECTIVE / $\text{=}\text{ɛ}\text{!}\text{/}$ is complete: there is no trace left of it, only a tonal difference. This example provides an insight into how tonal morphology expands, through segmental simplifications – a type of evolution that is especially well-attested among Bantu languages. This topic will be taken up in the typological discussion.

Returning to possessive constructions in Na, a pronoun may also immediately precede the noun, as in (xyz2).

(xyz2) “ $\text{njx}\text{!} \text{m}\text{y}\text{!}\dots \text{!} \text{ə}\text{!}\text{zu}\text{!} \text{!} \text{ʒu}\text{!}\text{-bi}\text{!}, \text{!} \text{ə}\text{!}\text{mi}\text{!} \text{!} \text{t}^{\text{h}}\text{i}\text{!}\text{-ʒu}\text{!}\text{-k}^{\text{h}}\text{u}\text{!}\text{!}”$

$\text{njx}\text{!}$ $\text{m}\text{y}\text{!}\text{!}$ $\text{ə}\text{!}\text{zu}\text{!}$ $\text{ʒu}\text{!}$ $\text{bi}\text{!}$
1SG daughter 1pl.incl to_die imm_fut

“My dear daughter... We are going to die [=we can’t avoid death, now that the tiger is at our door]; let Mum die [=let me sacrifice myself, so you can survive]!” (Tiger.16)

Combinations between pronouns and nouns as in (xyz2) were systematically elicited. The results are identical for the 1SG and 2SG pronouns, / $\text{njx}\text{!}\text{/}$ and / $\text{no}\text{!}\text{/}$. They are shown in Table 1.

Table 1. The tones of possessive constructions consisting of a 1SG pronoun and a noun.

tone	head	meaning	example	tone pattern
LM	$\text{bo}\text{!}\text{!}$	pig	$\text{njx}\text{!} \text{bo}\text{!}$	L#
LH	$\text{mv}\text{!}\text{!}$	daughter	$\text{njx}\text{!} \text{mv}\text{!}$	L#
M	$\text{zu}\text{!}$	life, existence	$\text{njx}\text{!} \text{zu}\text{!}\text{!}$	#H
L	$\text{dzu}\text{!}$	water	$\text{njx}\text{!} \text{dzu}\text{!}\text{!}$	#H
#H	$\text{h}\text{!}\text{!}$	human being	$\text{njx}\text{!} \text{h}\text{!}\text{!}\text{!}$	#H
MH#	$\text{ts}^{\text{h}}\text{u}\text{!}\text{!}$	goat	$\text{njx}\text{!} \text{ts}^{\text{h}}\text{u}\text{!}\text{!}$	MH#
M	$\text{po}\text{!}\text{lo}\text{!}$	ram	$\text{njx}\text{!} \text{po}\text{!}\text{lo}\text{!}$	M
#H	$\text{z}\text{w}\text{æ}\text{!}\text{zo}\text{!}\text{!}$	colt	$\text{njx}\text{!} \text{z}\text{w}\text{æ}\text{!}\text{zo}\text{!}\text{!}$	#H
MH#	$\text{hw}\text{x}\text{!}\text{li}\text{!}\text{!}$	cat	$\text{njx}\text{!} \text{hw}\text{x}\text{!}\text{li}\text{!}\text{!}$	MH#
H\$	$\text{kv}\text{!}\text{ʒe}\text{!}\text{!}$	flea	$\text{njx}\text{!} \text{kv}\text{!}\text{ʒe}\text{!}\text{!}$	H\$
L	$\text{k}^{\text{h}}\text{v}\text{!}\text{mi}\text{!}$	dog	$\text{njx}\text{!} \text{k}^{\text{h}}\text{v}\text{!}\text{mi}\text{!}$	°L
L#	$\text{da}\text{!}\text{ji}\text{!}$	mule	$\text{njx}\text{!} \text{da}\text{!}\text{ji}\text{!}$	L#
LM+MH#	$\text{ji}\text{!}\text{tʒæ}\text{!}\text{!}$	waist	$\text{njx}\text{!} \text{ji}\text{!}\text{tʒæ}\text{!}$	°L
LM+#H	$\text{bi}\text{!}\text{tʒ}^{\text{h}}\text{x}\text{!}\text{!}$	whiskers	$\text{njx}\text{!} \text{bi}\text{!}\text{tʒ}^{\text{h}}\text{x}\text{!}$	°L
LM	$\text{bo}\text{!}\text{mi}\text{!}$	sow	$\text{njx}\text{!} \text{bo}\text{!}\text{mi}\text{!}$	°L
LH	$\text{bo}\text{!}\text{ta}\text{!}$	boar	$\text{njx}\text{!} \text{bo}\text{!}\text{ta}\text{!}$	°L
H#	$\text{k}^{\text{h}}\text{v}\text{!}\text{na}\text{!}$	dog	$\text{njx}\text{!} \text{k}^{\text{h}}\text{v}\text{!}\text{na}\text{!}$	H#

In all cases, the pronoun carries the same tone as in isolation: a M tone. The patterns for monosyllabic nouns cannot be obtained through the application of a simple set of general rules. On the other hand, the patterns for disyllables are extremely simple. They consist in the succession of the pronoun, as said in isolation: /njɣɿ/, followed by the noun, which carries the same tone as when it appears on its own, except that some tone levels are deleted to comply with the requirements on a well-formed tone group. This affects the tone categories in which a L tone is attached to the first syllable: L, LM+MH#, LM+#H, LM, and LH. For these categories, the sequence found on the first two syllables (M tone on the pronoun, and L tone on the initial syllable of the disyllabic noun) is incompatible with any tone other than L on following syllables, following Rule xyz (“All syllables following a HL or ML sequence receive L tone”). For instance, /*njɣɿ boɭmi/ (obtained through simple concatenation) would not be a well-formed tone group; this is repaired to /njɣɿ boɭmiɿ/, lowering the final M to L.

This construction thus offers an example of minimal tonal integration of two elements: it can be described as concatenation of the two parts of the expression, followed by adjustments required by the general tone rules that apply in the language.

For disyllables, the tone patterns after the 3rd person pronoun, /tɕʰuɿ/, are identical with those after the 1st and 2nd persons. For monosyllables, on the other hand, the tone patterns are different. This asymmetry poses yet another challenge to the language learner, who must learn (i) to distinguish the tone patterns for these two tonal sets of pronouns when they associate with a monosyllabic noun, and (ii) to overlook the difference when the following noun is disyllabic. Table 2 shows the entire set.

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Table 2. The tones of possessive constructions consisting of a 3SG pronoun and a noun.

tone	example	meaning	with 3SG	tone pattern
LM	boɿ	pig	tɕʰuɿ boɿ	L#
LH	mvɿ	daughter	tɕʰuɿ mvɿ	L#
M	zuɿ	life, existence	tɕʰuɿ zu#ɿ	#H
L	dzuɿ	water	tɕʰuɿ dzuɿ	M
#H	hiɿ	human being	tɕʰuɿ hi#ɿ	#H
MH#	tsʰuɿ	goat	tɕʰuɿ tsʰuɿ	MH#
M	poɿloɿ	ram	tɕʰuɿ poɿloɿ	M
#H	zɰwæɿzo#ɿ	colt	tɕʰuɿ zɰwæɿzo#ɿ	#H
MH#	hwɿɿliɿ	cat	tɕʰuɿ hwɿɿliɿ	MH#
H\$	kvɿʃeɿ\$	flea	tɕʰuɿ-əɿda#ɿ	#H
L	kʰvɿmiɿ	dog	tɕʰuɿ kʰvɿmiɿ	°L
L#	daɿjiɿ	mule	tɕʰuɿ daɿjiɿ	L#
LM+MH#	jiɿtɕʰæɿ	waist	tɕʰuɿ jiɿtɕʰæɿ	°L
LM+#H	biɿtɕʰɿ#ɿ	whiskers	tɕʰuɿ biɿtɕʰɿ	°L
LM	boɿmiɿ	sow	tɕʰuɿ boɿmiɿ	°L
LH	boɿtaɿ	boar	tɕʰuɿ boɿtaɿ	°L
H#	kʰvɿnaɿ	dog	tɕʰuɿ kʰvɿnaɿ	H#

Finally, there also exists a looser construction: a simple juxtaposition of the pronoun and the noun, each in its own tone groups, as in (xyz3). This is not a possessive construction in the proper sense: rather, the pronoun serves as a topic.

(xyz3) “njɿɿ | ɿtɕʰeɿ-dɰɿmaɿ-tɕʰuɿ-dzoɿ, | noɿsuɿkɰɿ | tʰɰɿɿniɿ | loɿ
jiɿɿ-huɿɿ-tsuɿɿ”

njɿɿ ɿtɕʰeɿ-dɰɿmaɿ tɕʰuɿ dzo noɿsuɿkɰɿ
1SG given_name:ɿtɕʰeɿ-dɰɿmaɿ TOP TOP 2PL.EXCL
tʰɰɿɿniɿ loɿ jiɿ huɿ tsuɿɿ
that.day work to_do go.PST REP

“As for my [daughter] ɿtɕʰeɿ-dɰɿmaɿ... that day, you (=the members of your family) had gone away to work” (BuriedAlive2.132)

The context to this example is the following: a young woman was unhappy with a marriage arranged by her parents, and she committed a small fault, which took huge proportions; her mother has now come over to the mother-in-law’s house to make things right by talking the matter over.

The young woman's mother first recapitulates the whole story, clarifying what was done by the two parties: the members of the two families. In this situation, the first person pronoun in the construction /njɤt l ɬɬʰeɬ-dɬuɬmaɬ/ emphasizes the fact that the mother is speaking on her daughter's behalf, and that, as head of the family, she assumes some responsibility for her daughter's acts.

1.2. The pronoun 'oneself'

The pronoun 'oneself', /õɬɬ/, has a different behaviour from the 1st, 2nd and 3rd person pronouns. It is not followed by the possessive, /by/, except in the frequent construction /õɬɬ-byɬ-õɬ/ 'one's one', 'one's proper', 'by oneself', which can in turn be followed by a noun:

(xyzG) õɬɬ-byɬ-õɬ haɬ, l õɬɬ-byɬ-õɬ dzuɬ!

õɬɬ	by	õɬɬ	haɬ	dzuɬ
oneself	POSS	oneself	food	to_eat

'One's own food, one eats it oneself! We eat our own produce!' (Agriculture.68; this summarizes the traditional self-sufficiency of the Na, who grew their own food crops)

After /õɬɬ-byɬ-õɬ/, all tonal oppositions are neutralized, because the following noun can only carry L tones, due to a constraint formulated here as Rule xyz: "All syllables following a HL or ML sequence receive L tone".

The pronoun /õɬɬ/ usually combines with a following noun, without an intervening morpheme, as in (xyz).

(xyz) õɬɬ ɤɬmɤɬɬ niɬ-zeɬ!

õɬɬ	ɤɬmɤɬɬ	niɬ	zeɬ
self	elder_sibling	COP	PFV

'This is my own brother!' (Sister.57; Sister3.58; context: a young woman recognizes a ragged stranger attending her wedding as being her long-lost brother)

This construction, /õɬɬ+NOUN/, '[my/one's] own NOUN', has a tonal behaviour of its own. Combinations were systematically elicited. This did not prove difficult: on the analogy of (xyzG) above, new maxims can be coined, stating that 'one must sweep one's own garbage', /õɬɬ-dɬæɬ, õɬɬ bæɬ/ (from /dɬæɬɬ/ 'dust, dirt' and /bæɬɬ/ 'to sweep'), and 'one must look after

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one's own fields', /õl-lv̌l, õl lǐ/ (from /lv̌/ 'field' and /lǐ/ 'to watch; to attend to'). The data are shown in Table 3.

Table 3. The tones of possessive constructions consisting of /õľ/ + NOUN/.

tone	example	meaning	with /õľ/	tone pattern
LM	dæ̌ľ	dirt, dust	õľ-dæ̌ľ	H#
LH	mv̌ľ	daughter	õľ-mv̌ľ\$	H\$
M	lv̌ľ	field	õľ-lv̌ľ\$	H\$
L	dʒw̌ľ	water	õľ-dʒw̌ľ\$	H\$
#H	zǒľ	son	õľ-zǒľ	H#
MH#	ts ^h w̌ľ	goat	õľ-ts ^h w̌ľ\$	H\$
M	gǒľmǐľ	younger sister	õľ-gǒľmǐľ	H#
#H	zɰw̌æ̌ľzǒľ	colt	õľ-zɰw̌æ̌ľzǒľ	#H
MH#	ə̌ľmv̌ľ	elder sibling	õľ-ə̌ľmv̌ľ / õľ-ə̌ľmv̌ľ	MH# / MH#°
H\$	ə̌ľďǎľ\$	father	õľ-ə̌ľďǎľ	H#
L	k ^h v̌ľmǐľ	dog	õľ-k ^h v̌ľmǐľ	MH#°
L#	ďǎľjǐľ	mule	õľ-ďǎľjǐľ	H#
LM+MH#	jǐľťšæ̌ľ	waist	õľ-jǐľťšæ̌ľ	MH#°
LM+#H	bǐľťš ^h ̌x̌ľ	whiskers	õľ-bǐľťš ^h ̌x̌ľ	MH#°
LM	ǎľkǒľ	home	õľ-ǎľkǒľ	MH#°
LH	bǒľťǎľ	boar	õľ-bǒľťǎľ	MH#°
H#	k ^h v̌ľňǎľ	dog	õľ-k ^h v̌ľňǎľ	H#

The behaviour of /õľ/ in association with disyllables coincides with that of determinative compounds containing a MH-tone determiner; with monosyllables, however, the tone patterns only coincide with those of determinative compounds for nouns with tone LM or MH#.

2. Reduplication of noun phrases, with a discussion of some marginal cases of reduplication

2.1. The reduplication of noun phrases

The reduplication of noun phrases is nowhere as frequent as that of verbs. The most widespread case is that of 'one' plus classifier, whose reduplication indicates iteration. The entire reduplicated phrase is integrated into a single tone group, and the tone pattern of the first part of the phrase conditions that of the second. After a H-tone classifier, the

second half of the phrase receives L tone, by application of rule xyz, e.g. /dʷat-niŋ~dʷat-niŋ/ ‘day after day’ (Reward.155, BuriedAlive2.85, Caravans.259). After a M-tone classifier, the second part is unaffected, as in /dʷat-ɛwɣt~dʷat-ɛwɣt/ ‘one heap after another’ (HouseBuilding.51). After L, the second part is lowered to L, by application of rule xyz, e.g. /dʷat-ziŋ~dʷat-ziŋ/ ‘one family after the other’ (Healing.94, Caravans.237). After MH, the H part of the contour lands onto the first syllable of the second half: /dʷat-kɣt~dʷat-kɣt/ ‘one tree after the other’ (HouseBuilding.28), from /dʷat-kɣtŋ/.

2.2. The reduplication of nonlexical words

The reduplication of words other than verbs and nouns is infrequent; it appears advisable to discuss it as an appendix to the above paragraph, rather than in a section of its own. Given the expressive load carried by reduplication, and its iconic connotations, it is no surprise that some irregular, marginal cases should be found, as in the closely related language Naxi (He Jiren and Jiang Zhuyi 1985, 30–33) and in many (presumably all) of the world’s languages.

/qʰat-niŋ/ ‘how many days’ reduplicates to /qʰat-niŋ~qʰat-niŋ/ ‘thus and so many days’ (Healing.29; the context is the following: a priest of the Na religion diagnoses the number of days of rituals it will take to cure a person’s disease will take). The tone pattern is not the same as in numeral-plus-determiner phrases, where the expected output would be M tone throughout the phrase.

The interrogative /ətsoŋ/ reduplicates to /ətsoŋ~ətsoŋ/ (Dog.48). This is also an unexpected pattern.

The word /zoŋ~zoŋ-mvŋ~mvŋ/ ‘thingummy’ looks a lot like it could be the product of reduplication, perhaps as a playful manipulation over /zoŋ-mvŋ/ ‘child’. A more common word for ‘thing’ is /tsoŋtsoŋ#, which may originate in a replication of the nominalizer /tsoŋ/. Both of the above nouns combine into /tsoŋ~tsoŋ-zoŋ~zoŋ-mvŋ~mvŋ/ ‘thingummies, stuff’, suggesting that at least from a synchronic point of view they are perceived as having a similar internal structure.

The reduplicated form /zuŋ~zuŋ/ for ‘life, existence’ is more frequent than monosyllabic /zuŋ/, but both are in common use.

The /lɣ.lɣ/ portion in /biŋ-lɣŋ~lɣŋ/ ‘snowflake’ and /dzoŋ-lɣŋ~lɣŋ/ ‘hailstone’ looks like a reduplicated /lɣ/; I would have expected the

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classifier for grains and round objects, /lɯ-/ , to stand here, and have no idea about the origin of this /lɯ/ morpheme.

The phrase /tɕɤt~tɕɤt/ ‘right at the moment that...’ looks clearly like a reduplicated form, but the simplex form could not be recovered.

Several four-syllable onomatopoeic expressions of the form ABAB were observed, all of them with a L.L.M.M tone pattern: /tsuɯɯqɥæɯ- tsuɯɯqɥæɯ/ ‘crashing sound; sound of timber falling down’ (HouseBuilding.243), /zuɯɯguɯ- zuɯɯguɯ/ ‘boom!’ (sound of heavy shock against a door: Tiger.15), /zɯɯɯzɕɯ- zɯɯɯzɕɯ/ ‘sound of tearing (leaves to small pieces)’ (FoodShortage2.zzzz), and /ɕiɯɯɥɥɥɥ- ɕiɯɯɥɥɥɥ/ and /zɯɯɯɕæɯ- zɯɯɯɕæɯ/ , both describing the dizziness of a character under a dazzling moonlight (Reward.17 and Reward.68). The symbol of reduplication, ~, is not used in the transcription of these expressions because there does not exist an identifiable simplex form; pooling these expressions together with cases such as those of verbs and nouns might create confusion.

Finally, there exists a reduplicated suffix /-ʂo~ʂo/: adding it to nouns conveys a sense of abundance. Because of its relevance to the discussion of tone patterns on disyllabic suffixes, this case is dealt with in section 5.

3. Affixes

This section discusses nominal affixes. Clitics will be discussed in the following section (§xyz3).

3.1. The gender suffixes /-mi/, /-zo/ and /-p^hv/

The most common affixes in Na are gender suffixes: /-mi/, /-zo/ and /-p^hv/, carrying the meaning ‘female, mother; large’, ‘son, young; small’, and ‘male’, for instance in /ɬiɯmi/ ‘female roebuck’, /ɬiɯzo/ (variant: /ɬiɯzo#/) ‘young roebuck’, and /ɬiɯp^hv/ (variant: /ɬiɯp^hv#/) ‘male roebuck’.

These suffixes are related to the free morphemes /miɯ/, /zoɯ/ and /p^hvɯ/, which appear in contexts such as /tɕ^huɯɯ | miɯ ni/ ‘this is a female’, /tɕ^huɯɯ | zoɯ ni/ ‘this is a male/young’, /tɕ^huɯɯ | p^hvɯ ni/ ‘this is a male’. The morpheme /mi/ is also cognate with the classifier /mi/ (tone: L2) used for various animals. But as suffixes, /-zo/ and /-p^hv/ always have the same tonal patterns, also sharing the same tonal variants, as in the example of ‘roebuck’ above. On the other hand, their tonal behaviour differs from that of /-mi/. These observations suffice to establish (i) that suffixes are not

toneless, and (ii) that some of the tonal oppositions found on monosyllabic nouns are neutralized when these nouns function as suffixes. Due to the limited number of suffixes, it is not possible to tell for sure how many tones exist on suffixes, however.

The suffixes /-mi/ and /-zo/ serve as augmentative and diminutive suffixes, respectively. ‘Mother’ stands for ‘large’, and ‘son’ for ‘small’, as in numerous languages of the area (see Mazaudon 2003 on Tamang; and a cross-language discussion by Matisoff 1992). For instance, /k^hɣ-ɿ/ ‘basket (carried on back)’ yields /k^hɣ-ɿmi/ ‘large basket’ and /k^hɣ-ɿzo/ ‘small basket’. This construction is in competition with the adjectives /dɯɿ/ ‘large’ and /tɕiɿ/ ‘small’, which can be added after any object, whereas /-mi/ and /-zo/ are restricted to a closed set of words. In many cases, the augmentative meaning has faded away. For instance, while there exists an augmentative counterpart /ljɣɿmi/ to /ljɣɿ/ ‘main beam’, both terms are currently used to refer to the same object, namely main (supporting) beams. It is not possible to build an augmentative /*zɿɿɿmi/ on the basis of /zɿɿɿ/ ‘small beam’ (referring to the slanting beams resting on the supporting beams, upholding the roofing: planks or tiles), with the intended meaning of ‘a large-sized /zɿɿɿ/’.

It may also be the same morpheme /-mi/ that appears in the second syllable of the words /ɲiɿmi/ ‘sun’ and /ɕiɿmi/ ‘moon’, which currently lack a monosyllabic counterpart. Since these two words have the same structure in Naxi (/ɲiɿme/ and /ɕeɿme/) and Laze (/ɲieɿmie/ and /ɕieɿmie/), their disyllabic status is likely to go back a long way. The suffix /-zo/ appearing in /ɲiɿzo/ ‘fish’, another disyllable without a monosyllabic counterpart, is also found in Laze (/zeɿ/ ‘son’, /ɲiɿze/ ‘fish’), whereas Naxi has a monosyllable: /ɲiɿ/.

The discussion below covers names of animals and peoples with gender suffixes, as well as the augmentative and diminutive suffixes. Needless to say, great care was exercised to exclude words that contain a /mi/ syllable of other origin, e.g. the name of the Yongning monastery, /dɕɕɿmi/, which is a loanword from Tibetan *dgra med*.

Table 4 presents the data set arranged by tone. Part a presents disyllables, and part b trisyllables. Nouns in which the suffixes are augmentative/diminutive and not gender suffixes are italicized (i.e. nouns that do not refer to animals or ethnic groups). As elsewhere, a slash separates variants. An asterisk as the only content of a cell indicates that the form does not exist: for instance, it is not possible to use a /-zo/-suffixed word for ‘piglet’ (the attested form is /bæɿbv/). An asterisk preceding a

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noun indicates that it is a form that was proposed by the investigator and rejected by the consultant. For instance, “zæJmi#l (*zæJmiJ)” for ‘female panther’ indicates that the tonal variant /zæJmiJ/, tested by the investigator on the analogy of the existence of a L-tone variant /*ziJmiJ/ for ‘female ape’, whose root belongs in the same category as ‘panther’, was rejected by the consultant. Finally, italics are used for two words that are well-formed but so unusual that they sound weird, according to consultant F4: ‘male camel’ and ‘small camel, baby camel’.

Table 4. Nouns with gender suffixes, or augmentative/diminutive suffixes. Part a: disyllabic suffixed words.

root	suffixed forms		
	/-mi/	/-zo/	/-p ^h v/
<i>LM-tone roots, first type of correspondences</i>			
sow	boJmiɬ	*	boJp ^h vɬ
hen	æJmiɬ	*	*
<i>Words for which internal reconstruction yields a LM-tone root of the first type</i>			
thumb	loJmiɬ	*	*
bee	dzeJmiɬ	*	*
<i>LM-tone roots, second type of correspondences</i>			
yak	bvɬmiɬ	bvɬzo#l / bvJzoJ	bvɬp ^h v#l / bvJp ^h vJ
sparrow	dʒwæɬmiɬ	dʒwæɬzo#l / dʒwæJzoJ	dʒwæɬp ^h v#l / dʒwæJp ^h vJ
hawk	kɣɬmiɬ	kɣɬzo#l / kɣJzoJ	kɣɬp ^h v#l / kɣJp ^h vJ
food steamer	bvɬmiɬ	bvJzoJ / bvɬzo#l	*
<i>LM-tone roots, third type of correspondences</i>			
weasel	dvJmi#l / dvJmiɬ	dvJzo#l / dvJzoɬ	dvJp ^h v#l / dvJp ^h vɬ
goose	aJmi#l / aJmiɬ	aJzo#l / aJzoɬ	aJp ^h v#l / aJp ^h vɬ
lizard	dzoJmi#l / dzoJmiɬ	dzoJzo#l / dzoJzoɬ	dzoJp ^h v#l / dzoJp ^h vɬ
ladle	tɕ ^h oJmi#l / tɕ ^h oJmiɬ	tɕ ^h oJzo#l / tɕ ^h oJzoɬ	*
Na (people)	naJmi#l / naJmiɬ	naJzo#l / naJzoɬ	*
<i>LM-tone roots, fourth type of correspondences</i>			
jackal	p ^h ɣJmiJ	p ^h ɣɬzo#l / p ^h ɣJzoJ	p ^h ɣɬp ^h v#l / p ^h ɣJp ^h vJ
road, path	zɣJmiJ	*	*

<i>LH-tone roots, first type of correspondences</i>			
panther	zæJmi#ŋ (*zæJmiJ)	zæJzo#ŋ (*zæJzoJ)	zæJp ^h v#ŋ (*zæJp ^h vJ)
monkey	ziJmi#ŋ / ziJmiJ	ziJzo#ŋ / ziJzoJ	ziJp ^h v#ŋ / ziJp ^h vJ
buffalo	t ^h aJmi#ŋ (*t ^h aJmiJ)	t ^h aJzo#ŋ	t ^h aJp ^h v#ŋ
muntjac	tɕ ^h uJmi#ŋ / tɕ ^h uJmiJ	tɕ ^h uJzo#ŋ / tɕ ^h uJzoJ	tɕ ^h uJp ^h v#ŋ / tɕ ^h uJp ^h vJ
plane (tool)	t ^h iJmi#ŋ (*t ^h iJmiJ)	t ^h iJzo#ŋ (*t ^h iJzoJ)	*
<i>LH-tone roots, second type of correspondences (isolated example)</i>			
slope	toJmiJ	toJzoJ	*
<i>LH-tone roots, third type of correspondences (isolated example)</i>			
plain	diJmiJ	*	*
<i>M-tone roots: one single type of correspondences</i>			
tiger	laJmi#ŋ	laJzo#ŋ	laJp ^h v#ŋ
goral	seJmi#ŋ	seJzo#ŋ	seJp ^h v#ŋ
message	q ^h wæJmi#ŋ	*	*
<i>L-tone roots: one single type of correspondences</i>			
woman	mvJmiJ	*	*
ewe	joJmiJ	joJzo#ŋ / joJzoJ	joJp ^h v#ŋ / joJp ^h vJ
roebuck	fiJmiJ	fiJzo#ŋ / fiJzoJ	fiJp ^h v#ŋ / fiJp ^h vJ
bottle	kɣJmiJ	kɣJzoJ (*kɣJzo#ŋ)	*
large river	dzuJmiJ	*	*
<i>H-tone roots, first type of correspondences</i>			
cow	jiJmiJ	jiJzo#ŋ	jiJp ^h v#ŋ
horse	zɰwæJmiJ	zɰwæJzo#ŋ	zɰwæJp ^h v#ŋ
dog	k ^h vJmiJ	k ^h vJzo#ŋ	k ^h vJp ^h v#ŋ
<i>H-tone roots, second type of correspondences</i>			
Pumi (people)	bɣJmi#ŋ	bɣJzo#ŋ	*
pheasant	hoJmi#ŋ	hoJzo#ŋ	hoJp ^h v#ŋ
cooking pan	vJmi#ŋ	vJzo#ŋ	*
<i>H-tone roots, third type of correspondences</i>			
door	k ^h iJmiJ	k ^h iJzo#ŋ	*
canal	q ^h æJmiJ	q ^h æJzo#ŋ	*
tree trunk	ʃiJmiJ	*	*

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<i>MH-tone roots: first type of correspondences</i>			
cat	hwɿ-miŋ\$	hwɿ-zo#ŋ / hwɿ-zoŋ\$	hwɿ-p ^h v#ŋ / hwɿ-p ^h vŋ\$
doe	tʂ ^h æ-miŋ\$	tʂ ^h æ-zo#ŋ / tʂ ^h æ-zoŋ\$	tʂ ^h æ-p ^h v#ŋ / tʂ ^h æ-p ^h vŋ\$
goat	ts ^h u-miŋ\$	ts ^h u-zo#ŋ / ts ^h u-zoŋ\$	ts ^h u-p ^h v#ŋ / ts ^h u-p ^h vŋ\$
crane	ɤv-miŋ\$	ɤv-zo#ŋ / *ɤv-zoŋ\$	ɤv-p ^h v#ŋ / ɤv-p ^h vŋ\$
wasp	tɕu-miŋ\$	tɕu-zo#ŋ / tɕu-zoŋ\$	tɕu-p ^h v#ŋ / tɕu-p ^h vŋ\$
basket	k ^h ɿ-miŋ\$	k ^h ɿ-zoŋ\$ (*k ^h ɿ-zo#ŋ)	*
needle	ɤo-miŋ\$	ɤo-zo#ŋ (*ɤo-zoŋ\$)	*
scales	tɕu-miŋ\$	tɕu-zoŋ\$ (*tɕu-zo#ŋ)	*
bowl	q ^h wɿ-miŋ\$	q ^h wɿ-zoŋ\$ (*q ^h wɿ-zo#ŋ)	*
stomach	ho-miŋ\$	*	*
<i>MH-tone roots: second type of correspondences (isolated example)</i>			
building	zi-miŋ	*	*
<i>Words without a corresponding monosyllable</i>			
<i>Words that may derive from a root carrying tone M or H</i>			
water buffalo	dzi-mi#ŋ	dzi-zo#ŋ (*dzi-zoŋ)	dzi-p ^h v#ŋ
granddaughter	zy-mi#ŋ	*	*
sun	ɲi-mi#ŋ	*	*
<i>Words that may derive from a root carrying tone L or LM</i>			
duck	bæ-miŋ	bæ-zo#ŋ	bæ-p ^h v#ŋ
large vat	dzo-miŋ	dzo-zo#ŋ	*
sword	ɤæ-miŋ	ɤæ-zo#ŋ	*
<i>Words that may derive from a root carrying tone LH, L, H or MH</i>			
fox	ɬɿ-miŋ	*	*
tummy, belly	bi-miŋ	*	*
louse	ʂe-miŋ	*	*
wife	tʂ ^h v-miŋ	*	*
king, lord	ɤo-miŋ	*	*
moon	ti-miŋ	*	*
<i>Words that may derive from a root carrying tone LM or LH</i>			
frog	pɿ-miŋ	*	pɿ-p ^h vŋ
<i>Words that may derive from a root carrying tone LM, LH or H</i>			
tongue	hi-miŋ	*	*
large comb	pɿ-miŋ	*	*
axe	bi-miŋ	*	*
heart	nv-miŋ	*	*
niece	ze-miŋ	*	*
mule	ɬu-mi#ŋ	ɬu-zo#ŋ	ɬu-p ^h v#ŋ

<i>Words that may derive from a root carrying tone LM or H</i>			
bow	zyɿmiɿ	zyɿzo#ɿ	*
<i>Words that may derive from a root carrying any tone except LH</i>			
fish	*	piɿzo#ɿ	*
<i>Words whose tone does not correspond to any of the attested correspondences</i>			
Hwamei (bird)	tɕuɿmiɿ	*	*
lighter	tseɿmiɿ	*	*

Table 4, part b: three-syllable suffixed words

<i>Disyllables with tone M: first type of correspondences. Note: the suffixed forms of ‘earthworm’, a hermaphrodite animal, were artificially elicited.</i>			
rabbit	tʰoɿliɿ-miɿ	tʰoɿliɿ-zo#ɿ	tʰoɿliɿ-pʰv#ɿ
serpent	zyɿbæɿ-miɿ	zyɿbæɿ-zo#ɿ	zyɿbæɿ-pʰv#ɿ
lion	siɿguɿ-miɿ	siɿguɿ-zo#ɿ	siɿguɿ-pʰv#ɿ
earthworm	dzuɿdvɿ-miɿ	dzuɿdvɿ-zo#ɿ	dzuɿdvɿ-pʰv#ɿ
<i>Disyllables with tone M: second type of correspondences.</i>			
demon	siɿbvɿ-mi#ɿ	siɿbvɿ-zo#ɿ	*
ghost	tsʰoɿqʰwɿ-mi#ɿ	tsʰoɿqʰwɿ-zo#ɿ	*
Bai (people)	fiɿbvɿ-mi#ɿ	fiɿbvɿ-zo#ɿ	*
<i>Disyllables with tone L</i>			
bird	vɿdzeɿ-miɿ	vɿdzeɿ-zoɿ	vɿdzeɿ-pʰvɿ
<i>Disyllables with tone L#</i>			
bat	dzeɿbɿɿ-miɿ	dzeɿbɿɿ-zoɿ	dzeɿbɿɿ-pʰvɿ
owl	moɿjoɿ-miɿ	moɿjoɿmiɿ-zoɿ	moɿjoɿmiɿ-pʰvɿ
<i>Disyllables with tone LM+MH#</i>			
wolf	õɿdvɿ-miɿ	õɿdvɿ-zo#ɿ	õɿdvɿ-pʰv#ɿ
<i>Disyllables with tone H#</i>			
camel	njɿɿmvɿ-miɿ	njɿɿmvɿmiɿ-zoɿ	njɿɿmvɿmiɿ-pʰvɿ
<i>Words without a corresponding disyllable</i>			
cicada	dzuɿdzeɿmi#ɿ	*	*
vulture	seɿgwɿɿ-miɿ	*	*
salamander	*	hiɿpiɿ-zoɿ	*

For two of the items that lack a monosyllabic counterpart, the tone of the root can be obtained through internal reconstruction: since there is a substantial number of examples (7) of LM-tone disyllables corresponding with LM-tone monosyllables, and there is no other attested source for LM-tone disyllables, /dzeɿmiɿ/ ‘bee’ and /loɿmiɿ/ ‘thumb’ can be hypothesized

to be derived from LM-tone roots. For most of the items that lack a monosyllabic counterpart, however, internal reconstruction does not lead to a clear-cut conclusion, since several tone categories of roots feed into the same tone categories of disyllables. For instance, /ni-tzo#l/ ‘fish’ could originate in a monosyllabic root of any tone category except H, and M-tone words with the /-mi/ suffix, such as /dʒ-tmi-t/ ‘fox’, could be derived from any of the following four tone categories of monosyllables: LH, L, H or MH.

The purpose of Table 4 is to provide a bird’s eye view of the tonal correspondences. It does not contain pieces of information about etymology and frequency of use that are relevant to the analysis: for instance, that /t-tmi-t/ ‘tree trunk’ etymologically means ‘big bone’; that /po-tlo-t/ is a more common form for ‘ram’ than the /-p^hv/-suffixed form; and that /-zo/-suffixed forms are more common than /-p^hv/-suffixed forms to refer to male mules and water buffalos. Such facts are adduced in the discussion below; they can be looked up in the Glossary entries.

The tonal correspondences between monosyllabic roots and disyllables are not bijective. The diversity of tonal correspondences suggests that disyllables with this suffix have different degrees of lexicalization, and different degrees of historical depth; it would thus be misleading to think of the suffixed forms as the result of a synchronic, currently productive morphological process. Semantically, there is a continuum between disyllables with a clearly female meaning, such as ‘sow’, and disyllables in which the semantic content of the suffix has become bleached, e.g. /k^hv-tmi-t/ which simply means ‘dog’, not specifically ‘she-dog’. After semantic bleaching is completed, suffixes need to be added anew to specify gender: for instance, ‘camel’ is /njɣ-tmv-tmi-t/, ‘baby camel’ is /njɣ-tmv-tmi-t-zo-t/ and ‘male camel’ is /njɣ-tmv-tmi-t-p^hv-t/.

The study of combinations for which two tone patterns are acceptable, e.g. /hwɣ-tzo#l/ and /hwɣ-tzo-l\$/ for ‘male kitten’, shows that tonal variants are largely item-specific (lexicalized): out of the set of nine words suffixed in /-zo/ or /-p^hv/ corresponding with a MH-tone root, only four allow both variants, #H and H\$. Among the nine words, four refer to names of objects: ‘basket’, ‘needle’, ‘scales’, and ‘bowl’; interestingly, none of these four allows a tonal variant: they all fall into one category or the other (#H for ‘needle’, and H\$ for the other three). By contrast, four of the five animal names allow both variants. The difference between the gender suffixes and size suffixes in this respect is statistical, not clear-cut: some nouns referring to objects allow two variants. For instance, ‘ladle’ conforms to the

exceptionless existence of two tone variants for LM-tone roots: /tɕʰoɭmi#ɿ/~tɕʰoɭmiɿ/, and /tɕʰoɭzo#ɿ/~tɕʰoɭzoɿ/. Still, there appears to be a tendency for animal names to preserve a tonal flexibility reflecting the stronger perception of their internal structure by the speakers.

In some cases, it is possible to identify factors that played a role: ‘little bottle’, /kɣɭzoɿ/, does not have the expected #H-tone variant /*kɣɭzo#ɿ/; to the consultant, the latter form immediately summons up the given name /kɣɭzo#ɿ/. Supposing that ‘little bottle’ once had two tonal variants, L and #H, the pressure to avoid homophony may have played an important role in the selection of the variant /kɣɭzoɿ/ to the exclusion of the other.

The data are discussed below tone by tone, discussing the suffix /-mi/, then the suffixes /-zo/ and /-pʰv/.

3.1.1. LM-tone roots

There are no less than four tone correspondences between monosyllables with tone LM and suffixed forms: LM, as in /boɭmiɿ/ ‘sow’ and /æɭmiɿ/ ‘hen’; M, as in /bvɿmiɿ/ ‘female yak’, /dʒwæɿmiɿ/ ‘female sparrow’ and /kɣɿmiɿ/ ‘female falcon’; LM+#H, in /dvɿmi#ɿ/ ‘female weasel’, /ɑɭmi#ɿ/ ‘goose’, /dzoɿmi#ɿ/ ‘female lizard’ and /naɭmi#ɿ/ ‘Na woman’; and finally L, in /pʰɣɿmiɿ/ ‘female jackal’.

Three LM-tone nouns outside the semantic sphere of animal names can carry the /-mi/ suffix, with three of the above four tone patterns. One has M tone: /bvɿmiɿ/ ‘big food steamer’ (from /bvɿ/ ‘food steamer’). Another has LM+#H tone: /tɕʰoɭmi#ɿ/ ‘big ladle’ (from /tɕʰoɿ/ ‘ladle’). The third has L tone: /zɣɿmiɿ/ ‘road, path’, which does not specifically mean ‘large road’ anymore: the monosyllable /zɣɿ/, likewise meaning ‘road, path’, is falling into disuse.

Given the diversity of these patterns, it is hard to establish the relative chronology of the tone rules that produced the four types (LM, M, LM+#H, and L). A few hints may be detected nonetheless. While LM-tone monosyllables correspond to no less than four tone categories of suffixed forms, LM-tone suffixed forms only correspond to LM-tone monosyllables. Said differently, LM-tone monosyllables are the only source of LM-tone disyllables. On this basis, the two words /dzeɿmiɿ/ ‘bee’ and /loɿmiɿ/ ‘thumb’, for which there exists no corresponding monosyllable in the present state of the language, can plausibly be interpreted as originating in nouns of the LM category: *dzeɿ and *loɿ. Judging from these two reconstructed examples, and from the two examples ‘sow’ and ‘hen’, all of

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which belong to basic vocabulary, the LM::LM correspondence between monosyllable and disyllable can be hypothesized to reflect an older pattern.

The tone patterns for the /-zo/ and /-p^hv/ suffixes are fully consistent with those for the suffix /-mi/: in the second type of correspondences, the former two always have #H (with L as a variant) when the latter has M; in the third type, all three prefixes have LM+#H, with LM as a variant. On the other hand, these patterns differ widely from those observed in other syntactic structures, such as compound nouns and combinations between nouns and verbs or adjectives. This state of affairs requires the language learner to grasp a number of rules applying in different morphosyntactic contexts; it also entails good distinctivity.

3.1.2. *LH-tone roots*

Monosyllables with tone LH correspond with disyllables carrying tone LM+#H. But some items also have a L-tone variant, namely /z̥iɿmi#ɿ/ and /ziɿmiɿ/ for ‘female monkey’, and /tɕ^huɿmi#ɿ/ and /tɕ^huɿmiɿ/ for ‘female muntjac’, whereas /zæɿmi#ɿ/ ‘female panther’ does not allow this variant: the form /*zæɿmiɿ/ is not acceptable. Outside the field of animal names, /t^hiɿmi#ɿ/ ‘large plane’ (from /t^hiɿ/ ‘plane [carpentry tool]’) cannot be realized as /*t^hiɿmiɿ/; conversely, the word for ‘large slope’ (from /toɿ/ ‘slope’) is /toɿmiɿ/, and cannot be pronounced /*toɿmi#ɿ/. No certainty can be reached at present on whether two different tone rules applied at different times – in which case the existence of two variants would be a development due to analogy or dialect contact – or the two variants used to coexist for all items and were lost by individual lexical items. The fact that variants are present for the majority of items within the same correspondence class suggests the latter hypothesis.

Two other patterns are illustrated by one single example each, which may be relatively old: M tone in /diɿmiɿ/ ‘plain’ (compare ‘earth, land’, /diɿ/), and LH tone in /lɿɿmiɿ/ ‘major beam’.

3.1.3. *M-tone roots*

Monosyllables with M tone yield disyllables with #H tone: /laɿmi#ɿ/ ‘female tiger’ and /seɿmi#ɿ/ ‘female goral’. This pattern is also found, outside the semantic field of animal names, in /q^hwæɿmi#ɿ/ ‘message; letter’. That the rule is currently productive was verified by adding the

augmentative suffix to the M-tone noun /qwæ-/ ‘bed mat’: this yields /qwæ+mi#/ ‘large bed mat’.

The situation is more complex for disyllables, with two attested patterns: °L, in /si+gu+mi-/ ‘lionness’, /zy+ba+mi-/ ‘female serpent’ and /t^ho+li+mi-/ ‘hare’; and #H, in /i+bu+mi#/ ‘woman of the Bai ethnic group’. The latter correspondence coincides with that found for monosyllables. To determine which of the two is currently productive, the suffix was added to a word to which it is not normally attached: ‘earthworm’, /dzu+dv+/. The imagined context was the following: a child wonders whether there exist male and female earthworms, and asks, ‘Are there female earthworms?/Do female earthworms exist?’ The speaker had no hesitation in formulating the question as: /dzu+dv+mi↓, | ə↓-dzo↑↑?/, with °L tone on the suffixed form /dzu+dv+mi↓/ ‘female earthworm’.

The tone patterns for the /-zo/ and /-p^hv/ suffixes are identical with those for /-mi/.

3.1.4. L-tone roots

Words derived from L-tone monosyllables yield M-tone disyllables: /jo+mi+/- ‘ewe’, /i+mi+/- ‘female roebuck’, and /mv+mi+/- ‘woman’. The form /mv+mi+/- for ‘woman’ is attested in a proverb discussed in the narrative “The Sister’s Wedding” (Sister.130, 131, 139, 158, 171 and Sister3.3, 113, 117); it is no longer understood by younger speakers, such as M23. It is therefore likely that the correspondence between L-tone roots and M-tone disyllabic forms reflects a tone rule that already has a relatively great time depth. The same pattern is observed in /kx+mi+/- ‘large bottle’ and /dzu+mi+/- ‘large river’.

The tone patterns for the /-zo/ and /-p^hv/ suffixes are identical for roots with tones L and LM.

3.1.5. H-tone roots

For words derived from H-tone monosyllables, there exist three patterns: #H tone, in /ho+mi#/- ‘female pheasant’ and /bɣ+mi#/- ‘Pumi woman’; L tone, in /ji↓mi↓/ ‘cow’, /zɥæ↓mi↓/ ‘mare’ and /k^hv↓mi↓/ ‘dog’ (about which more below); and M tone, in three highly lexicalized words: /k^hi+mi+/- ‘main door’, /q^hæ+mi+/- ‘canal; large ditch’, and /t̃+mi+/- ‘tree trunk’ (etymologically ‘large bone’).

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The first pattern makes good synchronic sense: the tones of the monosyllable and disyllable correspond neatly with each other, and the semantic relationship is also clear, with one term that does not refer to gender and one that does. The second and third patterns are not phonologically transparent. Concordantly, the semantic relationship is less clear in some cases. The words for ‘mare’, ‘cow’ and ‘dog’ illustrate three stages in the gradual evolution of the suffix’s meaning. The monosyllable for ‘horse’, /zɥwæɭ/, is in common use, and the word for ‘mare’, /zɥwæɭmiɭ/, simply specifies gender. On the other hand, the monosyllable /jiɭ/ for ‘cow’ is not in frequent use; there are more than ten different disyllables pronounced /jiɭ/, six of them with H tone, and the /-mi/ suffix serves purposes of disambiguation. In this role, while the suffix retains its female meaning, it can be said to function as an animal suffix just as much as a female suffix. The third example, /kʰvɭmiɭ/, ‘dog’, is already further down this evolutionary path: it refers to dogs both male and female, and the monosyllable /kʰvɭ/ for ‘dog’ is seldom used (see examples in the narrative “Dog: How dog and man exchanged their lifespan”). These observations suggest that #H may be the tone of more recently derived words, and L a tone that used to obtain at an earlier stage, and that remains lexically preserved in some old words.

This conjecture is confirmed by examples from outside the semantic field of animal names: /saɭmiɭ/ ‘Cannabis indica’ (the psychotropic plant), corresponding to monosyllabic /saɭ/ ‘Cannabis sativa’ (used to produce thread), has L tone. The semantic content of the suffix is ‘large’, referring to the size of the leaves (as an aside: in Chinese too, ‘cannabis’ 大麻 *dà má* is derived from ‘hemp’ 麻 *má* by addition of the augmentative 大 *dà* ‘large’). Again, this suggests that L was the tone that used to obtain at an earlier stage. By contrast, ‘large pot’, /vɭmiɭ#,/, a less clearly lexicalized and probably more recent disyllable, carries #H tone, as does /suɭɭiɭmiɭ#/ ‘backbone, spine’ (compare /suɭɭiɭ#/ ‘tree trunk’).

The tone patterns for the /-zo/ and /-pʰv/ suffixes are identical for roots with tones H and M.

3.1.6. *MH-tone roots*

MH-tone monosyllables all correspond to disyllables with H\$ tone. The following examples were observed: /hwɣɭmiɭ\$/ ‘she-cat’; /tʂʰæɭmiɭ\$/ ‘hind’; /tsʰuɭmiɭ\$/ ‘nanny goat’; /ɤvɭmiɭ\$/ ‘female crane’; /tɕuɭmiɭ\$/ ‘wasp’; and, from outside the semantic field of animal names, /kʰɣɭmiɭ\$/

‘large basket’, /koɫmiɫ\$/ ‘big needle’, /tɕuɫmiɫ\$/ ‘large basket’, and /hoɫmiɫ\$/ ‘stomach, bowels’ (the latter now more common than monosyllabic /hoɫ/, and with no strong connotation of ‘big’).

Words with the /-zo/ and /-p^hv/ suffixes can carry either #H, a pattern which is widely attested with these suffixes, or H\$, the same tone found in /-mi/-suffixed items.

3.1.7. Some observations about other lexical tones

As predicted by rule xyz, tone L# yields M.L.L, its final L level spreading over the suffix: /dzeɫbɣɫ-miɫ/ ‘female bat’, /dzeɫbɣɫ-zoɫ/ ‘little bat, pup’, and /dzeɫbɣɫ-p^hvɫ/ ‘male bat’. On this basis, a disyllabic /*moɫjoɫ/ can confidently be extracted from /moɫjoɫ-miɫ/ ‘owl’. (The asterisk here indicates the status of /*moɫjoɫ/ as an internal reconstruction, not as an ungrammatical form.)

The tone patterns of the last four words in Table 4, ‘vulture’, ‘Hwamei’, ‘lighter’ and ‘salamander’, have no equivalent elsewhere in the table, so that it is not possible to extract the tones of their roots.

3.1.8. Concluding general observations

The patterns in Table 4 are summarized in Table 5; it must be emphasized that the classification into currently productive patterns and older patterns for the /-mi/ suffix is highly speculative. As elsewhere, a slash (/) separates variants.

Table 5. Tonal correspondences between monosyllables and forms with the suffixes /-mi/, /-zo/ and /-p^hv/, with tentative indications on whether the tone pattern is currently productive.

tone pattern of suffixed forms			
		/-mi/	/-zo/, /-p ^h v/
	older?	productive?	no distinctions in productiveness
<i>Monosyllabic nouns</i>			
LM	LM; L	M; LM+#H / LM	LM+#H / LM; #H / L
LH	M; LH; L	LM+#H / L	LM+#H / L
M		#H	#H
L		M	#H / L
H	L; M	#H	#H
MH		H\$	#H / H\$

<i>Disyllabic nouns</i>			
M	#H	°L (L#)	#H
H		#H	
L		L	L
L#		L#°	L#°
LM+MH#		LM+H#	LM+#H
H#		H#°	*

Roots with the same lexical tones correspond with diverse tones on suffixed forms, with as many as four types of correspondences for tone LM. The total number of subsets in Table 4, excluding disyllabic roots, is 14. Since /-mi/ on the one hand, and /-zo/ and /-p^hv/ on the other, fall into different tone categories, there exist 28 potentially distinct tonal types of suffixed nouns. Given that many types have variants, the number of different tones on suffixed nouns could be considerable; one could expect it to cover the entire range of 11 existing tone patterns for disyllables. Yet the set of tones observed on suffixed nouns is limited to 6: {M, #H, H\$, L, LM, LM+#H}, apart from two outliers (tones found on one single noun). Thus, some tone categories contain large amounts of words produced through compounding or suffixation, whether others are not fed by any currently productive combination processes. Such facts contribute to giving different lexical tone categories a specific morphological flavour.

Taking a static view of attested tone patterns for the /-zo/ and /-p^hv/ suffixes, it appears that only five patterns are attested: {#H, H\$, L, LM, LM+#H}. One more pattern is attested for /-mi/, namely M tone. The relatively greater simplicity of tone patterns for /-zo/ and /-p^hv/ may be linked to their more restricted distribution in the lexicon: words with the ‘male’ and ‘child’ suffix may have undergone more simplification of tone patterns by the analogical extension of productive patterns to marginal cases surviving the demise of earlier tone rules.

3.2. The suffix /-ʃwæ/ for ‘male’

In addition to the currently productive suffix /-p^hv/ for ‘male’, there also exists an earlier suffix, /-ʃwæ/, now with the meaning ‘castrated/neutered male’, but which may have had the meaning ‘male’ at an earlier stage. It appears in four items, shown in Table 6. In one of these, it clearly means ‘male’: /æʃwæʔ/, meaning ‘cock’, has no competitor with the suffix /-p^hv/ (it is not possible to say /*æʔp^hv#ʔ/). In the three others, it carries the

meaning ‘castrated male’, which has become its core meaning: /tʂʰu˥ | ʂwæ˥˩ ni˥/ (demonstrative+/ʂwæ˥˩/+copula) currently means ‘This is a castrated male’. Interestingly, the tone pattern is different for ‘cock’ and ‘castrated yak’, two words whose root has the same tone (tone LM) but in which the suffix takes different meanings: ‘male’ in one case, ‘castrated male’ in the other. It is a safe guess that /æ˥˩ʂwæ˥˩/ ‘cock’ has greater time depth.

The word for ‘castrated horse’ is /zʷæ˥˩ko˥˩/, with a different morpheme as its second syllable. Horses have long been the object of great care and interest on the part of speakers of Naish and other languages, so it is no wonder that the words belonging to this semantic field are numerous, some of them probably very old.

Table 6. Names of animals with the suffix /ʂwæ˥˩/.

tone of root	meaning of root	suffix form	meaning
LM	chicken	æ˥˩ʂwæ˥˩	cock (not castrated)
LM	yak	bv˥˩ʂwæ˥˩	castrated yak
L	sheep	jo˥˩ʂwæ˥˩	wether, castrated male sheep
MH	castrated goat	tsʰu˥˩ʂwæ˥˩	wether, castrated male goat

3.3. The kinship prefix /ə-/

The kinship prefix /ə-/ is common in languages of the area, such as Qiang (Evans and Huang 2007, 158–159), Yi, and Chinese. Table 7 presents the examples that were observed in Yongning Na, where this prefix is “the only common noun prefix” (Lidz 2010, 167).

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Table 7. Kinship terms with the prefix /ə-/.

kinship term	tone	meaning
ə- <i>ma</i> -l	M	mother (term of address)
ə- <i>mi</i> -l	M	mother; aunt
ə- <i>p^hv</i> -l	M	grandmother's elder brother
ə- <i>si</i> -l	M	great-grandmother; ancestor
ə- <i>d</i> o-l	M	boyfriend/girlfriend, lover
ə- <i>zi</i> -l	MH#	grandmother mother's mother
ə- <i>v</i> -l	MH#	maternal uncle
ə- <i>bo</i> -l\$	H\$	paternal uncle
ə- <i>da</i> -l\$	H\$	father
ə- <i>ɕj</i> -l	L#	lover, boy/girl-friend
ə- <i>j</i> -l	L#	maternal aunt: mother's elder sister
ə- <i>tɕi</i> -l	L#	maternal aunt: mother's younger sister
ə- <i>mv</i> -l	L#	elder sibling (brother or sister)
ə- <i>zu</i> -l / ə- <i>zu</i> -l	L# / L	dual: us two
ə- <i>su</i> -l ^{kv} / ə- <i>su</i> -l ^{kv}	°L / LMH	1 st person plural, inclusive

Monosyllabic forms do not exist, and no convincing method to extract the tone of the root could be found. It is tempting to hypothesize that the prefix does not make a tonal contribution, and that the tone of the disyllable reflects that of the root: disyllables with M, MH# and H\$ tone would originate in roots with M, MH, H tone, respectively; and disyllables with L# tone would originate in roots with tone L, LM or LH. But this reasoning is highly speculative; no evidence could be found to explore this issue. The root /mi/ in /ə-*mi*-l/ 'mother' is likely to be linked with /mi-l/ 'female', and with the classifier /mi-l/, but the difference in tone between the latter two cautions that closely related morphemes may have different tones.

From a static-synchronic point of view, it is also difficult to reach hard-and-fast conclusions, due to the limited amount of data: one prefix and four suffixes. With this qualification, one may observe that disyllables with tone M, H\$ or L can be the result of suffixation as well as prefixation; that disyllables with tone #H, H#, L, LM+#H can result from suffixation but not from prefixation; and that disyllables with tone MH# or L# can result from prefixation but not from suffixation.

Kinship terms in the Luoshui dialect (Lidz 2010, 167) are similar, e.g. Luoshui /a³³zu³³/ for 'grandmother' clearly seems cognate with Yongning /ə-*zi*-l/. Only three terms from L. Lidz's list are not attested in Yongning. One of these is /a³³pɔ³¹/, for 'uncle: father's elder or younger brother'. This

is likely to be a borrowing from Chinese *ābó* 阿伯 ‘brother-in-law; father’s older brother’. Borrowing is facilitated by the similar structure in both languages, with a similar prefix (in Chinese: *ā* 阿). A different term is in use in Yongning: /əɫboɫʂ/, whose voiced initial suggests that it is not a recent borrowing from Chinese, which does not have voiced stops. Ethnological data shed light on the fact that the terms for uncles on the father’s side do not correspond neatly across dialects: the social relationship with one’s father was traditionally loose, and there used to be no formal, social links between the child and the father’s relatives, and no distinct terms for these relatives. When necessary, the terms used within the traditional household, i.e. on the mother’s side, could be extended to refer to persons on the father’s side.

The peculiar family structure of Na society invites linguistic speculation as to the origin and evolution of the terms currently used for relatives on the father’s side. Fu Maoji (1980, 23; 1983, 38–39) hypothesizes that /əɫboɫʂ/ ‘uncle on the father’s side’ used to refer to male relatives of the father’s generation, on the father’s side, i.e. the father and his brothers, and that the introduction of the term /əɫdaɫʂ/ ‘father’ led to the specialization of /əɫboɫʂ/ to refer to uncles on the father’s side. This supposes that people had a term to refer to their paternal uncles (pooled together with their father under the term /əɫboɫʂ/) before they had a term for ‘father’. Since children did not live in the same household as their paternal uncles, and their only link to these uncles was through the father, Fu Maoji’s hypothesis on this topic appears highly implausible. To venture a further speculation, it may well be that, to him, as a respected, senior, male Chinese, it was the absence of a term for senior male relatives on the father’s side (上一辈男系尊亲属) that appeared implausible – despite his scholarly training and awareness of the specificities of Na society.

Keeping in mind that these hypotheses remain purely speculative at present, one could venture an alternative hypothesis: that the words reflected in present-day Yongning Na /əɫvɫɫ/ ‘uncle on the mother’s side’ and /əɫboɫʂ/ ‘uncle on the father’s side’ used to refer to the mother’s older and younger brothers, respectively. This new hypothesis would entail that the word /əɫboɫʂ/, corresponding to a socially less important and prestigious role than /əɫvɫɫ/, was later applied to uncles on the father’s side, while /əɫvɫɫ/ was extended to all of the mother’s brothers irrespective of age – preserving the hierarchy between /əɫvɫɫ/ as the more important social figure and /əɫboɫʂ/ as the less important social figure, while transforming

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the age hierarchy into a hierarchy between the mother's side and the father's side.

The second term that is not found in Yongning is /a³³mɔ¹³/ as another term for 'grandmother'. The third is /a³³la³¹/, referring to great-great-grandparents; in Yongning, the term /ə¹si¹/ is used for all ancestors of the great-grandmother's generation and above.

4. Enclitics

Enclitics are divided below into subsets on the basis of their behaviour after M-tone nouns: those that carry L tone in that context are considered to carry lexical L tone. The rest are provisionally grouped as having a tone other than L; they display a great diversity of behaviours.

4.1. L-tone enclitics: plural and collective

No proclitics were observed in Yongning Na. Among enclitics, a range of tonal types were observed. On the basis of their tonal behaviour after M-tone items, where they carry L tone, plural /=¹æ¹/ and collective /=¹ɿ¹/ are analyzed as having L tone. Table 8 presents the facts for the plural. Following a procedure already used in the study of the tones of nouns (§xyz of Chapter xyz), the possessive /-bv/ is added in cases where the plural carries M tone, in order to bring out the underlying tone of the expression.

Table 8. The tonal behaviour of plural / =ɿæ/

example	tone	with / =ɿæ-bv/	resulting tone
Na (ethnic group)	LM	naɿ = ɿæɿ-bvɿ	LM
daughter	LH	mvɿ = ɿæɿ-bvɿ	LH
Han (ethnic group)	M	hæɿ = ɿæɿ	L#
sheep	L	joɿ = ɿæɿ	LM
person, human being	H	hĩɿ = ɿæɿ\$ / hĩɿ = ɿæɿ	#H
deer	MH	tʂ ^h æɿ = ɿæɿ	H#
aunt	M	əɿmiɿ = ɿæɿ	°L
younger brother	#H	giɿzuɿ = ɿæɿ\$	H\$
maternal uncle	MH#	əɿvɿ = ɿæɿ\$	H\$
she-cat	H\$	hwɿɿmiɿ-ɿæɿ\$	H\$
woman	L	miɿzuɿ = ɿæɿ\$	L + H\$
older brother/sister	L#	əɿmɿɿ = ɿæɿ	L#°
wolf	LM+MH#	ōɿdvɿ = ɿæɿ\$	LM + H\$
Naxi (ethnic group)	LM+#H	naɿhĩɿ = ɿæɿ\$	LM + H\$
sow	LM	boɿmiɿ = ɿæɿ	LM°L
boar	LH	boɿtaɿ = ɿæɿ	LH°
young man	H#	p ^h æɿ-tʂiɿ = ɿæɿ	H#°

As elsewhere, the pronouns have an exceptional behaviour. The first and second persons, /njɿɿ/ and /noɿ/, yield /njɿɿ = ɿæɿ/ and /noɿ = ɿæɿ/ with the plural; this is different from the pattern that obtains for nouns, e.g. /joɿ = ɿæɿ/ ‘sheep’. On the other hand, the proximal demonstrative (also serving as 3rd person) /tʂ^huɿ/ and distal demonstrative /t^hvɿ/ yield /tʂ^huɿ = ɿæɿ\$/ and /t^hvɿ = ɿæɿ\$/, i.e. the same pattern as nouns.

The plural marker / =ɿæɿ/ is frequently used. By contrast, the collective, / =ɿ/, has a highly specific meaning, referring to the clan: the extended family circle. It is therefore mostly restricted to pronouns and family (clan) names, which are few in number. It cannot be used with kinship terms. It occasionally partakes in nominalization processes, however, as in example (xyz), where /p^hæɿ-t~p^hæɿ-t/ ‘to attach’, in association with / =ɿ/, comes to mean ‘a couple; a pair; a set (of things, persons...) tied together’.

(xyz) p^hæɿ-t~p^hæɿ-t = ɿɿ niɿ-kvɿ-tsuɿ-mvɿ
 p^hæɿ-t_b ~ = ɿɿ niɿ kvɿ-t_l tsuɿ-t_l mvɿ
 to_tie/fasten RED COLL COP ABILITIVE REP AFFIRM
 ‘[The mountains kɿɿ-mvɿ-t_l and æ-tʂæɿ-t_l] make up a couple/a pair!’ (Mountains.99)

The low frequency of /=*ɿ*l/ explains the great number of gaps in Table 9.

Table 9. *The tonal behaviour of collective /=*ɿ*l/*

example	meaning	tone	with /= <i>ɿ</i> l/	output
—	—	LM	—	—
—	—	LH	—	—
—	—	M	—	—
njɿl, noɿ	1SG, 2SG	L	njɿl= <i>ɿ</i> l, no= <i>ɿ</i> l	L#
tɕ ^h uɿ, t ^h vɿ	DEM.PROX, DIST	H	tɕ ^h uɿ= <i>ɿ</i> l, t ^h vɿ= <i>ɿ</i> l	L#
—	—	MH	—	—
dzeɿboɿ	family name	M	dzeɿboɿ= <i>ɿ</i> l	L#
—	—	#H	—	—
—	—	MH#	—	—
kvɿts ^h aɿ\$	family name	H\$	kvɿts ^h aɿ= <i>ɿ</i> l\$	H\$
laɿmaɿ	family name	L	laɿmaɿ-ɿl\$	L+H\$
əɿɕjoɿ	family name	L#	əɿɕjoɿ= <i>ɿ</i> l	L# ^o
—	—	LM+MH#	—	—
—	—	LM+#H	—	—
—	—	LM	—	—
—	—	LH	—	—
—	—	H#	—	—
dzɿɿkɿɿ\$	family name	LM+H\$	dzɿɿkɿɿ-ɿl\$	LM+H\$

Pronouns have a complex tonal behaviour, as is often the case. For the two L-tone pronouns (1SG and 2SG), the tone patterns with the collective are the same as with the plural: /njɿl=*ɿ*l/ and /noɿ=*ɿ*l/. As for the proximal demonstrative (also serving as 3rd person) /tɕ^huɿ/ and distal demonstrative /t^hvɿ/, they yield /tɕ^huɿ=*ɿ*l/ and /t^hvɿ=*ɿ*l/, whereas the forms with the plural are /tɕ^huɿ=*ɿ*æɿ\$/ and /t^hvɿ=*ɿ*æɿ\$/.

4.2. Enclitics that carry M tone when following a M-tone noun

This paragraph presents enclitics that carry M tone when following a M-tone noun – an indication that, unlike the enclitics presented in the previous paragraph, they do not have a L lexical tone. This negatively defined set of enclitics displays a great internal diversity.

Table 10 presents the tonal behaviour of three clitics: agentive/topic /-ŋu/, dative /-ki/ (whose tonal behaviour is identical with that of the possessive, /-bɣ/), and topic marker /-tʂʰu/. The latter can be hypothesized to be an extension of the 3rd person singular pronoun /tʂʰu/, which also serves as a demonstrative. Part a of the table presents examples, and part b the abstract tone patterns. The tones of /boɭ-ŋu/ and /zæɭ-ŋu/ are transcribed differently here on the basis of the knowledge of the existence of an opposition between LM and LH tones, but these two patterns are neutralized at the surface-phonological level. As elsewhere, variants are separated by a slash.

Table 10. The behaviour of agentive/topic /-ŋu/, dative /-ki/, and topic marker /-tʂʰu/ with monosyllabic and disyllabic nouns. Part a: examples in full.

example	tone	/-ŋu/	/-ki/	/-tʂʰu/
pig	LM	boɭ-ŋuɪ	boɭ-kiɪ	boɭ-tʂʰuɪ
leopard	LH	zæɭ-ŋuɪ	zæɭ-kiɪ	zæɭ-tʂʰuɪ
tiger	M	laɪ-ŋuɪ	laɪ-kiɪ	laɪ-tʂʰuɪ
sheep	L	joɪ-ŋuɪ	joɪ-kiɪ	joɪ-tʂʰuɪ
horse	H	zɰwæɪ-ŋuɪ	zɰwæɪ-kiɪ	zɰwæɪ-tʂʰuɪ
deer	MH	tʂʰæɪ-ŋuɪ	tʂʰæɪ-kiɪ	tʂʰæɪ-tʂʰuɪ / tʂʰæɪ-tʂʰuɪ ¹
fox	M	qɣɪmiɪ-ŋuɪ	qɣɪmiɪ-kiɪ	qɣɪmiɪ-tʂʰuɪ
colt	#H	zɰwæɪzoɪ-ŋuɪ	zɰwæɪzoɪ-kiɪ	zɰwæɪzoɪ-tʂʰuɪ
cat	MH#	hwɣɪliɪ-ŋuɪ	hwɣɪliɪ-kiɪ	hwɣɪliɪ-tʂʰuɪ
she-cat	H\$	hwɣɪmiɪ-ŋuɪ / hwɣɪmiɪ-ŋuɪ	hwɣɪmiɪ-kiɪ / hwɣɪmiɪ-kiɪ	hwɣɪmiɪ-tʂʰuɪ
dog	L	kʰɣɪmiɪ-ŋuɪ	kʰɣɪmiɪ-kiɪ	kʰɣɪmiɪ-tʂʰuɪ
mule	L#	daɪjiɪ-ŋuɪ	daɪjiɪ-kiɪ	daɪjiɪ-tʂʰuɪ
wolf	LM + MH#	õɪdvɪ-ŋuɪ	õɪdvɪ-kiɪ	õɪdvɪ-tʂʰuɪ
Naxi	LM + #H	naɪhɪɪ-ŋuɪ	naɪhɪɪ-kiɪ	naɪhɪɪ-tʂʰuɪ
sow	LM	boɪmiɪ-ŋuɪ	boɪmiɪ-kiɪ	boɪmiɪ-tʂʰuɪ
boar	LH	boɪtaɪ-ŋuɪ	boɪtaɪ-kiɪ	boɪtaɪ-tʂʰuɪ
rat	H#	hwæɪtsuɪ-ŋuɪ	hwæɪtsuɪ-kiɪ	hwæɪtsuɪ-tʂʰuɪ

¹ Both variants are attested in texts.

Part b: abstract tone patterns.

tone of noun	/-ŋu/	/-ki/	/-tɕ ^h u/
LM	L.M	L.M	L.M
LH	L.H	L.H	L.H
M	M.M	M.M	M.M
L	M.M	M.M	L.H
H	M.L	M.M	M.M
MH	M.H	M.H	M.H
M	M.M.M	M.M.M	M.M.M
#H	M.M.L	M.M.M	M.M.M
MH#	M.M.H	M.M.H	M.M.H
H\$	M.H.L / M.M.H	M.M.M	M.M.M
L	L.L.H	L.L.H	L.L.H
L#	M.L.L	M.L.L	M.L.L
LM+MH#	L.M.H	L.M.H	L.M.M
LM+#H	L.M.L	L.M.M	L.M.M
LM	L.M.M	L.M.M	L.M.M
LH	L.H.L	L.H.L	L.H.L
H#	M.H.L	M.H.L	M.H.L

An exceptional pattern is observed for /diɿ/ ‘earth’: in addition to the expected /diɿ-ŋu/ (observed e.g. in Reward.145), the form /diɿ-ŋuɿ/ is also acceptable (an example is found in Reward.121). This variant is not acceptable for other LH-tone nouns, e.g. it is not possible to say /*zæɿ-ŋuɿ/ for ‘leopard’.

The demonstratives /tɕ^huɿ/ (proximal, also 3rd person singular) and /t^hvɿ/ (distal) have a different behaviour from other H-tone items: they yield M.M in association with /-ŋu/: /tɕ^huɿ-ŋuɿ/, /t^hvɿ-ŋuɿ/ (also /tɕ^huɿ-lɑɿ/, /t^hvɿ-lɑɿ/ ‘this/that one too’). Not all pronouns have a special treatment in this respect: the 1st and 2nd person pronouns behave like other L-tone items: /ŋjɿɿ-ŋuɿ/, /noɿ-ŋuɿ/.

For typographical reasons, only three clitics are shown side by side in Table 10. The data for the clitic /-lɑ/, meaning both ‘too’ and ‘only’ (or, said differently, the two homophonous clitics meaning ‘too’ and ‘only’, respectively), are shown in Table 11.

Table 11. The behaviour of /-la/ ‘only; also’ with monosyllabic and disyllabic nouns.

example	tone	example	abstract tone pattern
pig	LM	boɿ-laɿ	L.M
leopard	LH	zæɿ-laɿ	L.H
tiger	M	laɿ-laɿ	M.M
sheep	L	joɿ-laɿ	L.H
horse	H	zɰwæɿ-laɿ	M.L
deer	MH	tʂ ^h æɿ-laɿ	M.H
fox	M	qɣɿmiɿ-laɿ	M.M.M
colt	#H	zɰwæɿzoɿ-laɿ	M.M.L
cat	MH#	hwɣɿliɿ-laɿ	M.M.H
she-cat	H\$	hwɣɿmiɿ-laɿ	M.H.L
dog	L	k ^h ɣɿmiɿ-laɿ	L.L.H
mule	L#	daɿjiɿ-laɿ	M.L.L
wolf	LM + MH#	õɿdvɿ-laɿ	L.M.H
Naxi	LM + #H	naɿhɿɿ-laɿ	L.M.L
sow	LM	boɿmiɿ-laɿ	L.M.M
boar	LH	boɿlaɿ-laɿ	L.H.L
rat	H#	hwæɿtsuɿ-laɿ	M.H.L

The four clitics /-ŋu/, /-ki/, /-tʂ^hu/ and /-la/ have a tantalizingly similar behaviour: the tone patterns for the four clitics are identical for eleven of the seventeen categories of nouns. The only difference between /-ŋu/ and /-la/ is in combination with the L category of monosyllables, where the patterns are M.M (e.g. /joɿ-ŋu/ ‘by the sheep’) and L.H (e.g. /joɿ-laɿ | ts^huɿ/ ‘sheep and goats’). Needless to say, the data in this section were carefully verified across several work sessions. (A recording is available: Tone_Only.)

4.3. The MH-tone enclitics /-qaɿ/ (dative/comitative) and /-giɿ/ ‘behind’

The enclitic /qaɿ/ has dative and comitative uses. It is analyzed as carrying MH tone on the basis of its behaviour after M-tone words both monosyllabic and monosyllabic, and after LM-tone disyllables. Table 12 sets out the data. (No recording was conducted.) The data for /-giɿ/ ‘behind’ are identical.

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Table 12. The tonal behaviour of the dative/comitative marker /-qaɿ/ following nouns.

example	tone	example	tone pattern
pig	LM	boɿ-qaɿ	L.M
leopard	LH	zæɿ-qaɿ	L.H (<i>on surface: same as LM</i>)
tiger	M	laɿ-qaɿ	M.MH
sheep	L	joɿ-qaɿ	L.LH
horse	H	zɰwæɿ-qaɿ	M.L
deer	MH	tʂʰæɿ-qaɿ	M.H
fox	M	qɰɿmiɿ-qaɿ	M.M.MH
colt	#H	zɰwæɿzoɿ-qaɿ	M.M.L
cat	MH#	hwɰɿliɿ-qaɿ	M.M.H
she-cat	H\$	hwɰɿmiɿ-qaɿ	M.H.L
dog	L	kʰvɿmiɿ-qaɿ	L.L.H
mule	L#	daɿjiɿ-qaɿ	M.L.L
wolf	LM + MH#	õɿdvɿ-qaɿ	L.M.H
Naxi	LM + #H	naɿhɿɿ-qaɿ	L.M.L
sow	LM	boɿmiɿ-qaɿ	L.M.MH
boar	LH	boɿtaɿ-qaɿ	L.H.L
rat	H#	hwæɿtsuɿ-qaɿ	M.H.L

Note that, as in all other morphosyntactic contexts, the L.H.L pattern is neutralized with L.M.L at the surface-phonological level. The tone pattern for ‘boar’ could therefore be transcribed as L.M.L (i.e. its surface-phonological representation), as well as L.H.L (a more abstract representation). The latter notation reflects the phonological analysis put forward in the present work: that the tone of the enclitic is lowered to L because of the presence of a preceding H tone – the H part of the LH tone pattern lexically attached to the noun ‘boar’. The choice of a notation as /L.M.L/ could seem advisable in order to stay closer to surface realizations, limiting the degree of abstraction of the notations; on the other hand, in the presentation of phonological data this could clash with the notation of the lexical categories – as if the LH lexical category somehow became LM when this enclitic is added.

4.4. The ambivalent behaviour of the (L-tone) topic-marker /dzo/

The topic-marker /-dzoɿ/, which can appear after nouns and verbs, raises a phonological issue. A MH-tone noun or verb preceding it is realized with a

MH contour, e.g. /t͡sʰæɪɿ-dzoɿ/ ‘as for the deer’ (from /t͡sʰæɪɿ/ ‘deer’) and /məɪ-lɑɪɿ-dzoɿ/ ‘as [he/she] did not strike’ (from /lɑɪɿ/ ‘to strike’). This suggests that there is a tone group boundary after the noun or verb, since contours are only realized tone-group-finally. Such a behaviour would not be unparalleled: for instance, the topic-marker /noɪɿ/ and the word /tʰiɿɿ/ ‘then’ always mark the beginning of a new tone group. But after nouns or verbs bearing a tone other than MH, the tonal behaviour of the topic-marker would suggest that it is integrated within the same tone group. For instance, after a M-tone noun or verb, the pattern is M.M.H, e.g. /lɑɪ-dzoɿ/ ‘as for the tiger’ and /məɪ-hwæɪ-dzoɿ/ ‘as [she/he] does not buy’. These observations suggest that these expressions constitute a single tone group. The full data set is presented in Table 13.

Table 13. The tonal behaviour of the topic-marker /-dzo/ following nouns.

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example	tone	example	tone pattern
pig	LM	boɿt-dzoɿ	LM.L
leopard	LH	zæɿɿ-dzoɿ	LH.L
tiger	M	laɿt-dzoɿ	M.H
sheep	L	*joɿɿ-dzoɿ; ættention: est: mvɿ-dzoɿɿ ʃfille), confirmz,	LH.L
horse	H	zʷæɿt-dzoɿ; confirmz; zoɿt-dzoɿ	M.L
deer	MH	tʂʰæɿɿ-dzoɿ; confirmz; õɿɿ-dzoɿ	MH.L
fox	M	qɿɿmiɿ-dzoɿ / qɿɿmiɿ- dzoɿ; pʰɿɿbɿɿ-dzoɿ / pʰɿɿbɿɿ-dzoɿ; diɿqoɿ- dzoɿ	M.M.H / M.M.M
colt	#H	zʷæɿzoɿt-dzoɿ	M.M.L
cat	MH#	hwɿɿliɿɿ-dzoɿ	M.MH.L
she-cat	H\$	hwɿɿmiɿ-dzoɿ; confirmé: əɿdaɿ-dzoɿ; mvɿkoɿ-dzoɿ	M.H.L
dog	L	kʰvɿmiɿɿ-dzoɿ	L.LH.L
mule	L#	daɿjiɿ-dzoɿ	M.L.L
wolf	LM + MH#	õɿdvɿɿ-dzoɿ	L.MH.L
Naxi	LM + #H	naɿhɿɿ-dzoɿ	L.M.L
sow	LM	boɿmiɿ-dzoɿ	L.M.H
boar	LH	boɿtɿtɿ-dzoɿ	L.M.L
rat	H#	hwæɿtsuɿ-dzoɿ	M.H.L

[xxxx DATA TO BE SUPPLEMENTED. Some observed patterns do not conform to the same rules : for instance, one would expect /*diɿqoɿ-dzoɿ/, on the analogy of /qɿɿmiɿ-dzoɿ/, but the observed pattern is M.M.M. This may have to do with the internal structure of disyllables.]

These data are taken up in §xyz of Chapter xyzQ, as part of the discussion of cases of breach of tonal grouping: how non-final syllables can come to carry a contour, and following syllables become extrametrical.

5. Association with disyllabic suffixes

This paragraph deals with disyllabic suffixes.

5.1. Spatial postpositions

The disyllabic spatial postpositions brought to light to date are /ko-t^ho/ ‘behind’, /ko-ta/ ‘in front of’, /to-ta/ ‘beside, to the side of’, /kwæ-gi#/ ‘to the left’, and /jo-gi/ ‘to the right’.

Table 14 shows the data for nouns followed by the spatial postpositions /to-ta/ ‘beside, to the side of’ and /ko-t^ho/ ‘behind’. The data for /ko-ta/ ‘in front of’ are identical with those for /to-ta/ ‘beside, to the side of’, and are therefore not shown in the table; likewise, the behaviour of /t^hæ-qo/ ‘under’ is identical with that of /ko-t^ho/ ‘behind’.

Table 14. The tonal behaviour of the spatial postpositions /to-ta/ ‘beside, to the side of’ and /ko-t^ho/ ‘behind’.

tone	example	meaning	to the side of	to the back of
LM	boɿ	pig	boɿ-to-ta	boɿ-ko-t ^h o
LH	zæɿ	leopard	zæɿ-to-ta	zæɿ-ko-t ^h o
M	laɿ	tiger	laɿ-to-ta	laɿ-ko-t ^h o
L	joɿ	sheep	joɿ-to-ta	joɿ-ko-t ^h o
L (PRONOUN)	noɿ	2SG	noɿ-to-ta	noɿ-ko-t ^h o
H	zɰwæɿ	horse	zɰwæɿ-to-ta	zɰwæɿ-ko-t ^h o
MH	tʂ ^h æɿ	deer	tʂ ^h æɿ-to-ta	tʂ ^h æɿ-ko-t ^h o
M	qɣɿmiɿ	fox	qɣɿmiɿ-to-ta	qɣɿmiɿ-ko-t ^h o
#H	zɰwæɿzo#ɿ	colt	zɰwæɿzoɿ-to-ta	zɰwæɿzoɿ-ko-t ^h o
MH#	hwɣɿliɿ	cat	hwɣɿliɿ-to-ta	hwɣɿliɿ-ko-t ^h o
H\$	hwɣɿmiɿ\$	she-cat	hwɣɿmiɿ-to-ta	hwɣɿmiɿ-ko-t ^h o
L	k ^h vɿmiɿ	dog	k ^h vɿmiɿ-to-ta	k ^h vɿmiɿ-ko-t ^h o
L#	daɿjiɿ	mule	daɿjiɿ-to-ta	daɿjiɿ-ko-t ^h o
LM+MH#	ōɿdvɿ	wolf	ōɿdvɿ-to-ta	ōɿdvɿ-ko-t ^h o
LM+#H	naɿhɿ#ɿ	Naxi	naɿhɿ-to-ta	naɿhɿ-ko-t ^h o
LM	boɿmiɿ	sow	boɿmiɿ-to-ta	boɿmiɿ-ko-t ^h o
LH	boɿtaɿ	boar	boɿtaɿ-to-ta	boɿtaɿ-ko-t ^h o
H#	hwæɿtsuɿ	rat	hwæɿtsuɿ-to-ta	hwæɿtsuɿ-ko-t ^h o

Table 15 shows the data for the spatial postpositions /kwæ-gi#/ ‘to the left’ and /jo-gi/ ‘to the right’.

Table 15. The tonal behaviour of the spatial postpositions /kʷæŋgi#/ 'to the left' and /joŋgi/ 'to the right'.

tone	example	meaning	to the left of	to the right of
LM	boŋ	pig	boŋ-kʷæŋgi#	boŋ-joŋgi#
LH	zæŋ	leopard	zæŋ-kʷæŋgi#	zæŋ-joŋgi#
M	laŋ	tiger	laŋ-kʷæŋgi#	laŋ-joŋgi
L	joŋ	sheep	joŋ-kʷæŋgi	joŋ-joŋgi
L (PRONOUN)	noŋ	2SG	noŋ-kʷæŋgi#	noŋ-joŋgi
H	zʷæŋ	horse	zʷæŋ-kʷæŋgi#	zʷæŋ-joŋgi
MH	tʂʰæŋ	deer	tʂʰæŋ-kʷæŋgi#	tʂʰæŋ-joŋgi
M	qʰɤŋmiŋ	fox	qʰɤŋmiŋ-kʷæŋgi#	qʰɤŋmiŋ-joŋgi
#H	zʷæŋzoŋ	colt	zʷæŋzoŋ-kʷæŋgi#	zʷæŋzoŋ-joŋgi
MH#	hwɤŋliŋ	cat	hwɤŋliŋ-kʷæŋgi#	hwɤŋliŋ-joŋgi
H\$	hwɤŋmiŋ\$	she-cat	hwɤŋmiŋ-kʷæŋgi#	hwɤŋmiŋ-joŋgi
L	kʰvŋmiŋ	dog	kʰvŋmiŋ-kʷæŋgi	kʰvŋmiŋ-joŋgi
L#	daŋjiŋ	mule	daŋjiŋ-kʷæŋgi	daŋjiŋ-joŋgi
LM+MH#	ōŋdvŋ	wolf	ōŋdvŋ-kʷæŋgi#	ōŋdvŋ-joŋgi
LM+#H	naŋhŋŋ	Naxi	naŋhŋŋ-kʷæŋgi#	naŋhŋŋ-joŋgi
LM	boŋmiŋ	sow	boŋmiŋ-kʷæŋgi#	boŋmiŋ-joŋgi
LH	boŋtaŋ	boar	boŋtaŋ-kʷæŋgi	boŋtaŋ-joŋgi
H#	hwæŋtsuŋ	rat	hwæŋtsuŋ-kʷæŋgi	hwæŋtsuŋ-joŋgi

The line 'L (PRONOUN)' indicates the tone patterns for L-tone pronouns, 1SG /nɤŋ/ and 2SG /noŋ/. The difference in tonal output between pronouns and nouns is clear: with the M-tone postposition 'beside', a L-tone pronoun yields a M-tone pattern: /noŋ-ŋoŋtaŋ/, and it is not possible to say /*noŋ-ŋoŋtaŋ/. Conversely, a L-tone noun yields a L-tone pattern: /joŋ-ŋoŋtaŋ/, and it is not possible to say /*joŋ-ŋoŋtaŋ/.

It would be nice and economical if the tone patterns in these tables were identical with those for other constructions, such as determinative compounds. Such is actually the case for /kʷoŋtʰoŋ/ 'at the back', which behaves tonally like a L#-tone head noun in determinative compounds, and for /ŋoŋtaŋ/ 'beside, to the side of', which behaves like a M-tone noun. Not all spatial postpositions share this behaviour, however: compare /hwɤŋliŋ-hiŋkʰuŋ/ 'cat's gums (body part)' (input tones: MH# and #H, output tone: MH#) and /hwɤŋliŋ-kʷæŋgi#/ 'to the left of the tiger' (same input; output tone: #H).

5.2. The conjunction /-pɣ-to/ ‘even’

The data for /-pɣ-to/ are set out in Table 16; the corresponding recording is Tone_Even.

Table 16. The tonal behaviour of /-pɣ-to/ ‘even’.

tone	example	meaning	N + /-pɣ-to/ ‘even’
LM	boɬ	pig	boɬ-pɣ-to
LH	zæɬ	leopard	zæɬ-pɣ-to
M	laɬ	tiger	laɬ-pɣ-to
L	joɬ	sheep	joɬ-pɣ-to; njɣ-to
#H	zɣwæɬ	horse	zɣwæɬ-pɣ-to
MH#	tʂʰæɬ	deer	tʂʰæɬ-pɣ-to
M	qɣ-miɬ	fox	qɣ-miɬ-pɣ-to
#H	zɣwæɬzoɬ	colt	zɣwæɬzoɬ-pɣ-to
MH#	hwɣ-liɬ	cat	hwɣ-liɬ-pɣ-to
H\$	hwɣ-miɬ\$	she-cat	hwɣ-miɬ-pɣ-to
L	kʰvɬmiɬ	dog	kʰvɬmiɬ-pɣ-to
L#	daɬjiɬ	mule	daɬjiɬ-pɣ-to
LM+MH#	õɬdvɬ	wolf	õɬdvɬ-pɣ-to
LM+#H	naɬhĩɬ	Naxi	naɬhĩɬ-pɣ-to
LM	boɬmiɬ	sow	boɬmiɬ-pɣ-to
LH	boɬɬaɬ	boar	boɬɬaɬ-pɣ-to
H#	hwæɬtsuɬ	rat	hwæɬtsuɬ-pɣ-to

The tonal behaviour of the conjunction /pɣ-to/ differs from that of L#-tone heads in compound nouns.

5.3. Addition of the reduplicated suffix /-soɬ-soɬ/ to nouns, conveying abundance

Addition of the reduplicated suffix /-soɬ-soɬ/ to nouns conveys abundance: e.g. /mɣɬ-soɬ-soɬ/ ‘smeared with grease, covered with grease’ (of a person’s mouth; Lake3.15), /ʂeɬ-soɬ-soɬ/ ‘with lots of meat, rich in meat’ (of dishes given to the dog on New Year’s Eve; Dog.35), or /siɬ-soɬ-soɬ/ ‘packed with wood’ (of the traditional Na house, made of wood; Housebuilding.281). This reduplicated suffix can be added to a great range of nouns, including count nouns, such as persons: a household with

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numerous young men may be described as /p^hætɕiŋ-ʂoŋʂoŋ/, ‘teeming with youngsters’. The wide range of semantic application of the suffix allows for the elicitation of an entire set, as shown in Table 17. (No audio recording has been conducted for this set.) As elsewhere, the ‘+’ sign in the transcription of surface tone patterns indicates the tone of the copula when placed after the expression – a test to ascertain the type of syllabic anchoring of a final H tone.

Table 17. *The tonal behaviour of the reduplicated suffix /-ʂoŋ~ʂoŋ/ depending on the tone of the preceding noun.*

example	tone	example	surface pattern	analysis
dust	LM	dæŋ-ʂoŋ~ʂoŋ	L.M.L	LM+L#
pimple	LH	jiŋ-ʂoŋ~ʂoŋ	L.H.L (=L.M.L)	LH°
star	M	kuŋ-ʂoŋ~ʂoŋ	M.M.H+L	H#
grease	L	mɤŋ-ʂoŋ~ʂoŋ	L.L.H+L	L+H#
meat	H	ʂeŋ-ʂoŋ~ʂoŋ	M.M.H+L	H#
mushroom	MH	moŋ-ʂoŋ~ʂoŋ	M.M.H+L	H#
dew	M	dʒvŋq ^h aŋ-ʂoŋ~ʂoŋ	M.M.M.L	L#
fly	#H	bvŋŋŋ-ʂoŋ~ʂoŋ	M.M.M.H+L	H#
paste	MH#	hoŋdʒuŋ-ʂoŋ~ʂoŋ	M.M.M.H+L	H#
mud	H\$	dʒæŋq ^h æŋ-ʂoŋ~ʂoŋ	M.M.M.H+L	H#
egg	L	æŋkɤŋ-ʂoŋ~ʂoŋ	L.L.L.H+L	L+H#
cake/bread	L#	dzeŋdvŋ-ʂoŋ~ʂoŋ	M.L.L.L	L#°
bean chaff	LM + MH #	nvŋtsaŋ-ʂoŋ~ʂoŋ	L.M.M.H+L	LM+H#
potato	LM + #H	jɤŋjoŋ-ʂoŋ~ʂoŋ	L.M.M.H+L	LM+H#
sow	LM	nvŋŋŋ-ʂoŋ~ʂoŋ	L.M.M.L	LM+L#
button	LH	pɤŋŋŋ-ʂoŋ~ʂoŋ	L.H.L.L	LH°
youngster	H#	p ^h ætɕiŋ-ʂoŋ~ʂoŋ	M.H.L.L	H#°

The tone of the suffix /ʂoŋ~ʂoŋ/ can be hypothesized to be L# (hence the notation /ʂoŋ~ʂoŋ/ adopted here) on the basis of its behaviour after M-tone disyllables and after LM-tone disyllables. In detail, the tone patterns are not straightforward; they differ from those of the other disyllabic suffixes, discussed in the preceding subsections (5.1 and 5.2).

6. A summary

There exists an impressive variety of tonal classes of grammatical words in Na: for instance, agent/ablative /-ŋu/, topic marker /-tɕ^hu/, and conjunction /-la/ differ in a few of their combinations with nouns; a fourth group, tantalizingly similar to the other three, contains dative /-ki/ and possessive /-by/. Not a few of the morphemes are one of a kind from the point of view of their tonal behaviour. This is further evidence of the high degree of complexity of Yongning Na morphotonology – a complexity that results from the great number of tonal paradigms, none of which is especially complex in itself.

Notes

Chapter 7

The verb phrase

This chapter discusses the tonal behaviour of the verb phrase.

“...the Na verb has a morphological structure of (PREFIX) + ROOT(S), with verbal suffixes being unattested. Na is quite analytical, and verbs are not inflected for person, gender, or number agreement (...). Tense, aspect, and mood are not inflectional, but rather appear as independent words within the verb phrase. The causatives, evidentials, and epistemics also are lexical rather than inflectional.” (Lidz 2010, 343)

The structure of the Na verb phrase as schematized by Lidz (2010, 350–351) comprises: Manner adverb - Verb complex - Causative - Intensifier - Tense/aspect and modal particles, and auxiliary verbs - Quotative evidential. To these may be added spatial indications, such as ‘forward’/‘backward’ and ‘upward’/‘downward’, which can interact tonally with the verb complex, as will be explained below.

The verb complex may be a lexical verb, an existential verb, a copula, or a serial verb construction, which may take a verbal prefix; two prefixes, in the case of the durative followed by the negation.

The verb complex constitutes a single tone group.

1. Combinations of verbs with grammatical morphemes

This section presents combinations of verbs with grammatical morphemes.

1.1. Reduplication

Table 1 presents the tone patterns of reduplicated verbs in Yongning Na. These correspondences hold for all the verbs for which a reduplicated form could be elicited, except a single unexplained exception: ‘to detour past, to bypass’, /wɿl~wɿl/ (surface form: /wɿl~wɿl/), whose tone does not correspond to any of the patterns below; its simplex form is /wɿl/.

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Table 1. The tone patterns of reduplicated verbs in Yongning Na.

tone	example	gloss	reduplication	tone: U	tone: S
H	dzuɿ	to eat	dzuɿ~dzuɿ#	#H	M.M
M _a	hwæɿ _a	to buy	hwæɿ~hwæɿ	H°	M.L
M _b	tɕ ^h iɿ _b	to sell	tɕ ^h iɿ~tɕ ^h iɿ	M	M.M
L _a	bæɿ _a	to sweep	bæɿ~bæɿ	H#	M.H
L _b	zɯwɿ _b	to speak	zɯwɿ~zɯwɿ	H	M.L
MH	laɿ	to strike	laɿ~laɿ	LM+MH	L.MH

The reduplicated expressions are transcribed with their underlying tone category. The underlying tone is also provided in the “tone: U[nderlying]” column, following the usual conventions. The tonal string that obtains in isolation is indicated in the “tone: S[urface]” line. The floating H tone, as in /dzuɿ~dzuɿ#/, does not surface in isolation, a context where floating H tones are never realized, and the result is M.M (/dzuɿ~dzuɿ/). The initial H tone cannot surface either, due to the general prohibition of tone-group-initial H tones. On the other hand, these H tones surface in the frame /ɕu- V~V -ɿ/ ‘to V a little’ (/ɕu- V -ɿ/: °delimitative, /ɕu- V -ɿ/: °inchoative), as shown in Table 2.

Table 2. Reduplicated verbs in a carrier phrase.

tone	example	gloss	reduplication	in frame ‘V a little’
H	dzuɿ	to eat	dzuɿ~dzuɿ#	ɕuɿ-dzuɿ~dzuɿ-ɿ
M _a	hwæɿ _a	to buy	hwæɿ~hwæɿ	ɕuɿ-hwæɿ~hwæɿ-ɿ
M _b	tɕ ^h iɿ _b	to sell	tɕ ^h iɿ~tɕ ^h iɿ	ɕuɿ-tɕ ^h iɿ~tɕ ^h iɿ-ɿ
L _a	bæɿ _a	to sweep	bæɿ~bæɿ	ɕuɿ-bæɿ~bæɿ-ɿ
L _b	zɯwɿ _b	to speak	zɯwɿ~zɯwɿ	ɕuɿ-zɯwɿ~zɯwɿ-ɿ
MH	laɿ	to strike	laɿ~laɿ	ɕuɿ-laɿ~laɿ-ɿ

The tone patterns of reduplicated verbs cannot be derived from those of the simple forms by any simple set of rules. M yields M~L (e.g. /hwæɿ/ ‘to buy’ > /hwæɿ~hwæɿ/); describing the L tone on the second syllable as a default tone would be entirely *ad hoc*, as this never happens elsewhere in Na, where the default tone is M. The pattern that would be expected for the M tone is M~M, which appears instead as the reduplicated form of the #H tone (e.g. /tɕ^hiɿ#/ ‘to sell’ > /tɕ^hiɿ~tɕ^hiɿ/): there is no trace of the verb’s floating tone in the reduplicated form. A floating H tone is found in the reduplicated form of H verbs; and a final H tone in reduplicated L-tone verbs. The final L in the reduplicated form of LM-tone verbs is as

surprising as the initial L in the reduplication of MH-tone verbs. The correspondences between simple and reduplicated tones appear to be learnt individually; they constitute a component of the tonal grammar of Yongning Na.

These reduplicated verbs were also elicited with /tsoɬ~tsoɬ/ ‘thing’ as a complement: see Table 3. In this combination, some of the oppositions are neutralized: the #H, H and L categories of verbs surface in the same way, as do L and LM.

Table 3. Reduplicated verbs with the #H-tone object ‘things’

tone	example	gloss	reduplication	in frame ‘V things’
H	dzuɿ	to eat	dzuɿ~dzuɿ#	tsoɬ~tsoɬ dzuɿ~dzuɿ
M _a	hwæɿ _a	to buy	hwæɿ~hwæɿ	tsoɬ~tsoɬ hwæɿ~hwæɿ
M _b	tɕ ^h iɿ _b	to sell	tɕ ^h iɿ~tɕ ^h iɿ	tsoɬ~tsoɬ tɕ ^h iɿ~tɕ ^h iɿ
L _a	bæɿ _a	to sweep	bæɿ~bæɿ	tsoɬ~tsoɬ bæɿ~bæɿ
L _b	zɯwɿ _b	to speak	zɯwɿ~zɯwɿ	tsoɬ~tsoɬ zɯwɿ~zɯwɿ
MH	laɿɿ	to strike	laɿ~laɿ	tsoɬ~tsoɬ laɿ~laɿ

The corresponding recordings are *Verbs_Redupl_F4_2007* and *Verbs_Redupl_F4_2012*.

Disyllabic verbs are rare; one single case of reduplication was observed: /sɿɿ~sɿɿdɿɿ~dɿɿɿ/ ‘pensively; with a heavy heart’ (Reward.49), from /sɿɿdɿɿ/ ‘to think; to miss’. This looks like a unique creation, rather than the result of a productive pattern: it is the only example of a correspondence between a M tone on the simplex form and a MH# tone on the reduplicated expression.

1.2. Prefixes

1.2.1. M-tone prefixes

The prefixes described in this section can be interpreted either as M-tone prefixes, or as toneless prefixes that receive M by default; no evidence was found that they are specified for tone. They are referred to as M-tone prefixes for convenience.

The most common verbal prefixes carrying M tone are /mɿɿ-/ NEGATION, /t^hɿɿ-/ PROHIBITIVE, /t^hiɿ-/ DURATIVE, and /leɿ-/

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ACCOMPLISHED.¹ They all have the same behaviour (apart from the exceptional case of M_c-tone verbs in association with /le-/, as reported in §xyz). A less common prefix, /mv-/, conveying imminence, has a behaviour of its own, described further below.

Table 4 presents the tonal behaviour of the most common prefixes. With a view to ease of reference, redundant data are provided, for three different prefixes: negation, durative, and prohibitive, all with identical tone patterns. Some of the original data are found in the following online recordings: VerbProhib_2007; VerbProhib _2008; VerbDurative_2007; and AccomPFv.

Table 4. The tones of verbs in association with a M-tone prefix.

tone	example	gloss	durative	prohibitive	negation
H	dzuɿ	to eat	t ^h iɿ-dzuɿ	t ^h ɑɿ-dzuɿ	mɻɿ-dzuɿ
M _a	hwæɿ _a	to buy	t ^h iɿ-hwæɿ	t ^h ɑɿ-hwæɿ	mɻɿ-hwæɿ
M _b	tɕ ^h iɿ _b	to sell	t ^h iɿ-tɕ ^h iɿ	t ^h ɑɿ-tɕ ^h iɿ	mɻɿ-tɕ ^h iɿ
L _a	bæɿ _a	to sweep	t ^h iɿ-bæɿ	t ^h ɑɿ-bæɿ	mɻɿ-bæɿ
L _b	zɯwɻɿ _b	to speak	t ^h iɿ-zɯwɻɿ	t ^h ɑɿ-zɯwɻɿ	mɻɿ-zɯwɻɿ
MH	laɿɿ	to strike	t ^h iɿ-laɿɿ	t ^h ɑɿ-laɿɿ	mɻɿ-laɿɿ

After a M-tone prefix, the lexical tones M, H, L and MH have a straightforward realization. The subcategories M_a and M_b are neutralized in this context; likewise for L_a and L_b.

Table 5 sets out the facts for the ACCOMPLISHED prefix /le-/ when the verb is followed by the CAUS and CERTITUDE(COP) suffixes.

Table 5. Tone patterns of the ACCOMP M-tone prefix+V+ CAUS+CERTITUDE(COP) construction

tone	example	gloss	ACCOMP	ACCOMP+V+CAUS+CERTITUDE(COP)
	e			
H	dzuɿ	to eat	leɿ-dzuɿ	leɿ-dzuɿ-tsæɿ-niɿ
M _a	hwæɿ _a	to buy	leɿ-hwæɿ	leɿ-hwæɿ-tsæɿ-niɿ
M _b	tɕ ^h iɿ _b	to sell	leɿ-tɕ ^h iɿ	leɿ-tɕ ^h iɿ-tsæɿ-niɿ

¹ “The accomplished prefix lə33- is used to give a reading of accomplishment to a verb with lexical aspect of ongoing state, process, or liminality. (...) The durative prefix t^hu33- [in the dialect studied here: /t^hiɿ/] is used to give a reading of ongoing action to verbs with lexical aspect of process or liminality” (Lidz 2010, 345).

L _a	bæ↓ _a	to sweep	le↓-bæ↓	le↓-bæ↓-tsæ↓-ni↓
L _b	zɯɣ↓ _b	to speak	le↓-zɯɣ↓	le↓-zɯɣ↓-tsæ↓-ni↓
MH	la↑↓	to strike	le↓-la↑↓	le↓-la↑-tsæ↓-ni↓

These data show that the expressions with surface M tones, exemplified by /le↓-hwæ↓/ and /le↓-tɕ^{hi}↓/, do not carry floating H tone: otherwise the following copula would surface with H tone. The data also shed light on the behaviour of the MH and H tones respectively illustrated by /le↓-la↑↓/ and /le↓-dzɯ↓/: the MH tone remains on the syllable to which it is lexically associated, projecting its H part to the next syllable (the CAUSATIVE); the H tone moves onto the CAUSATIVE, showing that this suffix constitutes a unit together with the verb, to the exclusion of the following COPULA (here conveying the speaker's certitude).

A related set of facts is presented in Table 6: the construction V-NEG-V, as in example xyz.

(xyz) ni↓-mɣ↓-ni↓, | mɣ↓-ɳy↓!
 ni↓ mɣ↓ ni↓ mɣ↓ ɳy↓
 COP NEG COP NEG to know/to get to know
 'Whether it is actually the case... we don't know!' (context: two persons discuss what a third person has said)

Two variants are possible, the one integrated into one single tone group, as in (xyz), the other divided into two groups: /ni↓ | mɣ↓-ni↓, | mɣ↓-ɳy↓/ (same meaning and morphemic composition as xyz). In the latter case, the first syllable has the same tone as in isolation, and the negated form the tone indicated in Table 4 above. These V-NEG-V constructions are typically followed by /mɣ↓-ɳy↓/ '[I/we] don't know' or /mɣ↓-do↓/ '[we] don't know/can't see for ourselves', sometimes with focalization of the V-NEG-V portion, e.g. /hwæ↓-mɣ↓-hwæ↓ F | mɣ↓-do↓/ '[I/we] don't know whether [they] bought [it/some] or not'.

In addition to the elicited data in Table 6, there exist some textual examples, e.g. in BuriedAlive3.133, Seeds2.85 and Dog59.

Table 6. Tone patterns of the V-NEG-V construction.

tone	example	gloss	V NEG V	V NEG V
H	dzɯ↓	to eat	dzɯ↓-mɣ↓-dzɯ↓	dzɯ↓ mɣ↓-dzɯ↓
M _a	hwæ↓ _a	to buy	hwæ↓-mɣ↓-hwæ↓	hwæ↓ mɣ↓-hwæ↓
M _b	tɕ ^{hi} ↓ _b	to sell	tɕ ^{hi} ↓-mɣ↓-tɕ ^{hi} ↓	tɕ ^{hi} ↓ mɣ↓-tɕ ^{hi} ↓

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L _a	gu↓ _a	to be true	gu↓-mɣ↓-gu↓	gu↓ mɣ↓-gu↓
L _b	zɣɣ↓ _b	to speak	zɣɣ↓-mɣ↓-zɣɣ↓	zɣɣ↓ mɣ↓-zɣɣ↓
MH	la↓	to strike	la↓-mɣ↓-la↓	la↓ mɣ↓-la↓

As mentioned at the outset of this section, the prefix /mv↓-/ , conveying imminence, is infrequent; only one example is found in the twenty-five narratives transcribed as of 2014. Table xyz presents the facts.

tone	example	gloss	t ^h i↓-mv↓-	(tɕ ^h u↓) mv↓- le↓-mɣ↓- -bi↓
H	dzu↓	to eat	↑ ↑ ↑	↑ ↑ ↑
M _a	hwæ↓ _a	to buy	↑ ↑ ↑	↑ ↑ ↑
M _b	tɕ ^h i↓ _b	to sell	↑ ↑ ↑	↑ ↑ ↑
L _a	bæ↓ _a	to sweep	↑ ↑ ↓	↑ ↑ ↓
L _b	zɣɣ↓ _b	to speak	↑ ↑ ↓	↑ ↑ ↓
MH	la↓	to strike	↑ ↑ ↑ ok	↑ ↑ ↑ , corrigé en: mv↓-la↓-bi↓

zzzz different from the other prefixes for H and for MH.

1.2.2. L-tone prefixes

The interrogative /ə↓-/ illustrates the case of L-tone prefixes. The interrogative is segmentally bleached, consisting in a simple schwa undergoing strong regressive vowel assimilation; from a tonal point of view, on the other hand, it has a specification of its own. Table 7 sets out the facts.

Table 7. The tones of verbs in association with a L-tone prefix

tone	example	gloss	interrogative
H	dzu↓	to eat	ə↓-dzu↓
M _a	hwæ↓ _a	to buy	ə↓-hwæ↓
M _b	tɕ ^h i↓ _b	to sell	ə↓-tɕ ^h i↓
L _a	bæ↓ _a	to sweep	ə↓-bæ↓
L _b	zɣɣ↓ _b	to speak	ə↓-zɣɣ↓
MH	la↓	to strike	ə↓-la↓

The realization of tones M and L after a L-tone prefix are straightforward. That of tones H and MH, on the other hand, is unexpected:

both have the same pattern, in which the tone of the prefix is raised to M, and the verb carries H. An observation – which does not amount to an explanation – is that if the interrogative particle were realized with its lexical L tone in all cases, as one could expect, then the contrast between M and H verbs would be neutralized, since /LM/ and /LH/ sequences are neutralized (to [LH]) in the surface-phonological form. However, this observation does not shed light on the fact that the MH tone is neutralized with H in this context: the sequence L.MH is well-formed, and there is no obvious reason why the interrogative followed by a MH-tone verb is not realized in that way, which would yield *əJ-lə-ŋ (intended meaning: ‘does (s)he strike’), for instance.

Such cases of modification of a tone by a following word are scarce in Yongning Na.

1.2.3. The marking of spatial orientation on verbs

A flamboyant marking of orientation on verbs is found in Rgyalrongic, and in Qiangic at large. Rgyalrongic languages “have a whole array of verbal orientation prefixes, which are obligatorily present on all perfective and imperative verb forms” (Sun 2000, 180; see also Lin 2002; and Jacques 2011 on Tangut). This conspicuous characteristic is sometimes awarded the status of a central criteria in proposed language classifications for this area of Sino-Tibetan (e.g. in proposals by Matisoff 2004, 105). Cross-dialect and cross-language differences reveal that orientation systems are no less prone to change than other areas of a language’s structure, however. The three distinct pairs of directions described by J. Sun are: eastward (i.e. in the direction of the rising sun) vs. westward; upstream vs. downstream; and uphill (upward) vs. downhill (downward). The system found in Shixing comprises two productive pairs of (non-obligatory) orientation prefixes, only one of which corresponds semantically with the Rgyalrongic system: upward vs. downward, the other being inward vs. outward; Shixing also displays traces of a third pair: hence/hither and forth/thither, found in a set construction meaning ‘to V back and forth’ (Chirkova 2009).

Under the hypothesis that directional prefixes go back a long way in the history of Sino-Tibetan, all Naish languages must be hypothesized to have lost them. In Naish, topographically-based spatial deixis is not marked through an obligatory prefix on verbs. Indications of orientation may more properly be called orientation adverbials, as in: /mɿJtəo- mɿ-ŋ-hu-ŋ!/ (downward-NEG-to_go.PST) ‘[The dog, who had come to sit on the wooden

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platform close to the fire pit, where dogs are not allowed] did not/would not get down!’ (example from a discussion about Sister3.22).

The only monosyllabic indications of orientation in common use, for which one could claim the status of prefixes, are /gɣɿ-/ ‘upward’ and /mɿɿ-/ ‘downward’. For instance, /ʃoɿ/ ‘to reap, to gather in’ can be used in association with /gɣɿ-/ ‘upward’, to mean ‘to reap in, to bring back to the house and into the granary’: /gɣɿ-ʃoɿ/. These monosyllabic prefixes also appear as part of set constructions, such as /gɣɿ-V | mɿɿ-V/:

(xyz) tʃʰuɿniɿ | gɣɿ-daɿ, | mɿɿ-daɿ, | gɣɿ-daɿ, | mɿɿ-daɿ, | (...)
 dʉɿ-soɿ ʃuɿ ʃiɿ-tsuɿ-mɿɿ! |
 tʃʰuɿniɿ gɣɿ- daɿ mɿɿ- daɿ dʉɿ-soɿ
 thus upward strike downward strike several
 ʃuɿ ʃiɿ tsuɿ mɿɿ
 times to_do REP AFFIRM
 ‘He would give blows high and low (=hither and thither), again and again! /
 He would strike blows in all directions, again and again!’ (Healing.38;
 context: an exorcist is performing a ritual)

In this context, the prefixes retain to some extent their literal meaning of ‘upward’ and ‘downward’: the exorcist’s blows with his sword are aimed high up, then down (close to the ground), and so on. But in this construction, these spatial indications take up a broader meaning, summoning up the swift, dance-like movements of the exorcist fighting with an invisible cohort of demons surrounding him. Their association with repetition (/gɣɿ-daɿ, | mɿɿ-daɿ, | gɣɿ-daɿ, | mɿɿ-daɿ/) participates in the same loosening of the exact indication of spatial orientation, yielding a surface effect of ‘in all directions’ rather than ‘up and down’.

When an orientation prefix is separated from the verb by other prefixes, it can constitute a tone group on its own, as in (xyz):

(xyz) ...gɣɿ | leɿ-tʃʰoɿ-seɿ-dzoɿ | tʰiɿ...
 gɣɿ leɿ- tʃʰoɿ seɿ -dzoɿ tʰiɿ
 upward ACCOMP to_pray completion top then
 ‘after one has prayed [literally: prayed up (to the ancestors)]’ (Dog2.54)

Judging from the small sample of available texts, monosyllabic /gɣɿ-/ ‘upward’ is more frequent than /mɿɿ-/ ‘downward’. Both are in competition

with disyllabic /gɣɫtɕoɫ/ ‘upward’ and /mvɫtɕoɫ/ ‘downward’, which are generally preferred.

‘Leftward’ and ‘rightward’ are expressed by disyllabic /kwæɫgi#ɫ/ or /kwæɫloɫ/ ‘to the left’, and /joɫgiɫ/ or /joɫloɫ/ ‘to the right’. Monosyllabic forms are tentatively labelled here as prefixes (and transcribed accordingly with a following hyphen) and disyllabic forms as adverbials, but in the absence of language-internal criteria to distinguish the two, the divide is not as clear as this choice of terms would suggest. From a tonal point of view, orientation prefixes interact tonally with the following verb, and are therefore considered to belong in the same tone group; orientation adverbials can likewise interact with the verb – although they more often than not constitute a tone group on their own, as discussed in §xyz of Chapter xyzQ_Synthesis.

The tonal behaviour of three more disyllabic adverbials is presented in Table 8: /koɫdaɫ/ ‘forward, to the front’ (tone: M), /koɫtʰoɫ/ ‘backward, to the back’ (tone: L#), and /toɫtaɫ/ ‘to the side’ (tone: M).

The example verbs used are /liɫ_a/ ‘to look’, /tsiɫ_b/ ‘to set, to install’, /biɫ_c/ ‘to go’, /seɫ/ ‘to walk’, /kwɣɫ_a/ ‘to throw’, /ɫɫ_b/ ‘to turn’, and /pʰæɫɫ/ ‘to shove, to push away’. The tone indicated after a ‘+’ sign is that carried by the ACCOMPLISHED /-ze/ after the directional+verb combination at issue: e.g. L.M+H for the combination of /gɣɫ-/ ‘upward’ and a verb with tone M_b indicates that the pattern is /gɣɫ-tɕiɫ/, /gɣɫ-tɕiɫ-zeɫ/ ‘to set in an upward direction’. As elsewhere, this information is only provided in cases where the tone of the ACCOMPLISHED /-ze/ cannot be obtained through the application of tone rules (xyz-xyz): for instance, L.H can only be followed by L, by virtue of rule xyz, so the information provided in the table for a combination such as /gɣɫ-seɫ/ ‘to walk upward’ is simply L.H, not L.H+L.

The original data, together with recordings, are found in the online document SpatialOrientation; the verb /biɫ_c/ ‘to go’ was accidentally omitted. This verb can combine with the disyllabic orientation adverbials, but not with monosyllabic /gɣɫ-/ ‘upward’ and /mvɫ-/ ‘downward’. The data are: /koɫdaɫ biɫ(-zeɫ)/, /kwæɫgiɫ biɫ(-zeɫ)/, /joɫloɫ biɫ/ (the variant /*joɫloɫ biɫ/ is not acceptable), /koɫtʰoɫ biɫ/, /gɣɫtɕoɫ biɫ(-zeɫ)/, and /kwæɫgiɫ biɫ(-zeɫ)/.

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Table 8a. The tonal behaviour of verbs after indications of spatial orientation.
Part a: monosyllabic prefixes. Left column: tone of prefix.

tone of prefix	tone of verb					
	M _a	M _b	H	L _a	L _b	MH
L	L.M+M	L.M+M	L.H	L.H	L.H	L.MH

Part b: disyllabic orientation adverbials. Left column: tone of adverbial.

	tone of verb						
	H	M _a	M _b	M _c	L _a	L _b	MH
M	M.M.M+L	M.M.M+M	M.M.M+L	M.M.M+M	M.M.L	M.M.L	M.M.MH
#H	M.M.M+L	M.M.L	M.M.M+L	M.M.M+L	M.M.H	M.M.H	M.M.L
L	L.L.L	L.L.H	L.L.H / L.L.L	L.L.L	L.L.H	L.L.H	L.L.H
L#	M.L.L	M.L.L	M.L.L	M.L.L	M.L.L	M.L.L	M.L.L
LM	L.M.M+L	L.M.M+M	L.M.M+M	L.M.M+M	L.M.L	L.M.L	L.M.MH
H#	M.H.L	M.H.L	M.H.L	M.H.L	M.H.L	M.H.L	M.H.L

A further complexity is that the behaviour of /aɭp^hoɭ/ ‘outside’ is not fully identical with that of /joɭgiɭ/ and /joɭloɭ/ ‘to the right’ – spatial indications that have the same lexical tone. In association with /t^hvɭ_a/ ‘come out’, /aɭp^hoɭ/ ‘outside’ yields /aɭp^hoɭ t^hvɭ/ ‘to go outside, to get outside’, instead of the expected /*aɭp^hoɭ t^hvɭ/. The latter form is not acceptable as a variant.

A closer examination of this issue reveals a further oddity: different verbs that belong in the same tonal class, M_a, have different tone patterns when associated with /aɭp^hoɭ/ ‘outside’. ‘To look outside’ (from /liɭ_a/ ‘to look’) is /əɭp^hoɭ liɭ/, and /*əɭp^hoɭ liɭ/ is not an acceptable variant. The verb /t^hvɭ_a/ ‘come out’ is an outlier: it is the only M_a-tone verb yielding a L.L.L tone pattern.

In view of the fact that L.L.L and L.L.H are both acceptable variants for /joɭgiɭ/ and /joɭloɭ/ ‘to the right’ followed by a M_a-tone verb, one can venture the speculation that the same pattern of variation once existed for /aɭp^hoɭ/ ‘outside’. Under this hypothesis, the L.L.L variant was in common use for /aɭp^hoɭ t^hvɭ/ ‘to go outside, to get outside’, and it failed to be regularized to L.L.H when the L.L.L variant for this tonal combination fell out of use.

Even treating the combination /aɭp^hoɭ t^hvɭ/ ‘to go outside, to get outside’ as a lexicalized oddity, the behaviour of /aɭp^hoɭ/ ‘outside’ is still different from that of /joɭgiɭ/ and /joɭloɭ/ ‘to the right’, however: see Table 9.

Table 9. The tonal behaviour of verbs in association with /aɭp^hoɭ/ ‘outside’.

tone of verb	example	meaning of verb	tone pattern
H	aɭp ^h oɭ seɭ	to walk	L.L.L
M _a	aɭp ^h oɭ liɿ	to look	L.L.H
M _a (exceptional)	aɭp ^h oɭ t ^h vɿ	to get/go	L.L.L
M _b	aɭp ^h oɭ hōɭ	to go (imperative)	L.L.L
M _c	aɭp ^h oɭ biɿ	to go	L.L.H
L _a	aɭp ^h oɭ kwɿɿ	to throw	L.L.H
L _b	aɭp ^h oɭ p ^h vɿ	to move around	L.L.H
MH	aɭp ^h oɭ ziɿ	to sleep	L.L.H

The interrogative /zoɭqoɿ/ ‘where’ has the same behaviour as /gɿɿtɕoɿ/ ‘upward’ and /mvɿtɕoɿ/ ‘downward’, as shown in Table 10. The verb /t^hvɿ/, whose association with /aɭp^hoɿ/ ‘outside’ yielded an unexpected pattern (see Table 9), is not any different from the other Ma-tone verbs, yielding /zoɭqoɿ t^hvɿ(-zeɿ)?/

Table 10. The tonal behaviour of verbs in association with /zoɭqoɿ/ ‘where’.

tone of verb	example	meaning of verb	tone pattern
H	zoɭqoɿ seɿ(-zeɿ)?	to walk	L.M.M + L
M _a	zoɭqoɿ ʃeɿ(-zeɿ)?	to look for	L.M.M + M
M _b	zoɭqoɿ p ^h æɿ(-zeɿ)?	to attach, to fasten	L.M.M + M
M _c	zoɭqoɿ huɿ(-zeɿ)?	to go.PST	L.M.M + M
L _a	zoɭqoɿ dziɿ	to sit; to live	L.M.L
L _b	zoɭqoɿ ɿɿ	to turn toward	L.M.L
MH	zoɭqoɿ laɿɿ	to strike, to hit	L.M.MH

On the morphosyntactic analysis of locative constituents

In principle, the tonal behaviour of locative constituents could shed light on their morphosyntactic treatment in Yongning Na. Various treatments are attested cross-linguistically. Agreement with the verb reveals in Central Bantu a typologically uncommon pattern: “a locative NP in preverbal position can be analyzed as the grammatical subject” (Creissels 2011, 34), whereas in Northern Sotho, in the absence of such evidence, the construction is better analyzed as “an impersonal construction with a preposed locative constituent” (Zerbian 2006).

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The tone patterns presented above are not fully identical with those of any other construction, however. In particular, they differ from subject+verb constructions (§3) as well as from object+verb constructions (§2).

The present subsection dealt with pre-verbal elements; those that follow present and analyze the facts for post-verbal elements.

1.3. Verbal suffixes and verb serialization: monosyllabic elements

Verbs appear after their object in Na. They can be followed by verbal suffixes, and by other verbs in serial verb constructions. This section deals with monosyllabic elements.

1.3.1. L-tone suffixes and serialized verbs

The morpheme indicating completion /-se/ and the desiderative/future morpheme /-ho/ both exist as full verbs; constructions where they appear after a verb may therefore be analyzed as serial verb constructions. Their tonal behaviour is fully identical. The morpheme /-su/ ‘first; in negative constructions: yet’ behaves like /-ho/. Other examples, not shown in Table 11, include the inchoative, /-ɬ/ in /dɬuɬ-V-ɬ/, and the morpheme /-dze/ ‘to remain; to be left over’, only observed in /dzuɬ-dze/ ‘left over after eating, 吃剩的’ /ɬuɬ-dze/ ‘left over after drinking, 喝剩的’.

Table 11. The patterns of L-tone tense-aspect-mood suffixes

tone	example	gloss	completion	desiderative/fut	not yet
H	dzuɬ	to eat	dzuɬ-seɬ	dzuɬ-hoɬ	mɛɬ-dzuɬ-suɬ
M _a	hwæɬ _a	to buy	hwæɬ-seɬ	hwæɬ-hoɬ	mɛɬ-hwæɬ-suɬ
M _b	tɕ ^h iɬ _b	to sell	tɕ ^h iɬ-seɬ	tɕ ^h iɬ-hoɬ	mɛɬ-tɕ ^h iɬ-suɬ
L _a	bæɬ _a	to sweep	bæɬ-seɬ	bæɬ-hoɬ	mɛɬ-bæɬ-suɬ
L _b	zɣwɛɬ _b	to speak	zɣwɛɬ-seɬ	zɣwɛɬ-hoɬ	mɛɬ-zɣwɛɬ-suɬ
MH	laɬɬ	to strike	laɬ-seɬ	laɬ-hoɬ	mɛɬ-laɬ-suɬ

1.3.2. M-tone suffixes

The immediate future /-bi/ and the experiential /-dzu/ are analyzed as carrying M tone in light of their behaviour after the negation, where they carry M tone. The imperative, /-hō/, is grammaticalized from the imperative form of the verb ‘to go’, /hō/. These M-tone suffixes all have the same behaviour, as shown in Table 12. Other suffixes with the same

tonal behaviour include /-dɔ-/ ‘must, have to’, the volitive /-tso-/ , the obligative /-zo-/ , and the causative /-tsæ-/.

Table 12. The tonal behaviour of M-tone suffixes

tone	example	gloss	IMM_FUT	EXPERIENTIAL	IMPERATIVE	analysis
H	dzuɿ	to eat	dzuɿ-biɿ	dzuɿ-dzuɿ	dzuɿ-hõɿ	M
M _a	hwæɿ _a	to buy	hwæɿ-biɿ	hwæɿ-dzuɿ	hwæɿ-hõɿ	M
M _b	tɕʰiɿ _b	to sell	tɕʰiɿ-biɿ	tɕʰiɿ-dzuɿ	tɕʰiɿ-hõɿ	M
L _a	bæɿ _a	to sweep	bæɿ-biɿ	bæɿ-dzuɿ	bæɿ-hõɿ	L
L _b	zɯwɿ _b	to speak	zɯwɿ-biɿ	zɯwɿ-dzuɿ	zɯwɿ-hõɿ	L
MH	laɿɿ	to strike	laɿ-biɿ	laɿ-dzuɿ	laɿ-hõɿ	H#

In addition to the surface-phonological forms, Table 12 proposes an analysis of the underlying tone, in the last column. This analysis is based on the tone patterns when the causative /-tsæ-/ is added after the immediate future /-bi-/ , as shown in Table 13. The copula, in its use to convey certainty, is also added, to further reveal the underlying tonal categories.

Table 13. Same tonal category of morphemes as in previous table, with immediate future plus causative plus copula

tone	example	gloss	-biɿ-tsæɿ-niɿ
H	dzuɿ	to eat	dzuɿ-biɿ-tsæɿ-niɿ
M _a	hwæɿ _a	to buy	hwæɿ-biɿ-tsæɿ-niɿ
M _b	tɕʰiɿ _b	to sell	tɕʰiɿ-biɿ-tsæɿ-niɿ
L _a	bæɿ _a	to sweep	bæɿ-biɿ-tsæɿ-niɿ (*bæɿ-biɿ-tsæɿ-niɿ)
L _b	zɯwɿ _b	to speak	zɯwɿ-biɿ-tsæɿ-niɿ (*zɯwɿ-biɿ-tsæɿ-niɿ)
MH	laɿɿ	to strike	laɿ-biɿ-tsæɿ-niɿ (*laɿ-biɿ-tsæɿ-niɿ)

The presence of a L tone on the copula (i.e. its lexical tone) in every case is interpreted to mean that there is no floating H tone in any of the verb phrases, hence the interpretation of the first three as M. The underlying tone category leading to the realizations /laɿ-biɿ/ and /laɿ-biɿ-tsæɿ/ (not /*laɿ-biɿ-tsæɿ/) is interpreted as H#.

As expected, all M-tone suffixes have the same behaviour when preceded by the negation, /mɿɿ-/, e.g. in /V-mɿɿ-biɿ/ ‘is not going to V’, /V-mɿɿ-dɔɿ/ ‘ought not to V’, and /V-mɿɿ-zoɿ/ ‘must not V’. Table 14 shows examples with /V-mɿɿ-biɿ/, and also with an added perfective, /ze/.

Table 14. Same tonal category of morphemes as in previous table, with negation

tone	example	gloss	V-neg-imm fut	V-neg-imm fut-pfv
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H	dzu˥	to eat	dzu˥-mɤ˥-bi˥	dzu˥-mɤ˥-bi˥-ze˥
M _a	hwæ˥ _a	to buy	hwæ˥-mɤ˥-bi˥	hwæ˥-mɤ˥-bi˥-ze˥
M _b	tɕʰi˥ _b	to sell	tɕʰi˥-mɤ˥-bi˥	tɕʰi˥-mɤ˥-bi˥-ze˥
L _a	bæ˥ _a	to sweep	bæ˥-mɤ˥-bi˥	bæ˥-mɤ˥-bi˥-ze˥
L _b	zɤ˥ _b	to speak	zɤ˥-mɤ˥-bi˥	zɤ˥-mɤ˥-bi˥-ze˥
MH	la˥˩	to strike	la˥-mɤ˥-bi˥	la˥-mɤ˥-bi˥-ze˥

In the data shown in Table 14, the H component found in the lexical categories H and MH (e.g. /dzu˥/ ‘to eat’, /la˥˩/ ‘to strike’) does not surface as such, but it results in the lowering of the perfective suffix /ze/, no less than three syllables distant from the verb. This is taken as additional evidence that the domain of application of tonal processes in Yongning Na is not defined in terms of a given number of syllables: tonal processes apply within the tone group. The phrase /dzu˥-mɤ˥-bi˥-ze˥/ ‘will not eat anymore’ constitutes a single tone group, and the underlying presence of a H tone in this group makes itself felt on the morpheme /ze/ irrespective of the number of intervening syllables.

The same phenomenon is observed when there is no intervening negation. The result for the six tone classes (M_a, M_b, H, L_a, L_b, and MH; M_c behaves like M_a and M_b in this context) is the following: /hwæ˥-bi˥-ze˥/; /tɕʰi˥-bi˥-ze˥/; /dzu˥-bi˥-ze˥/; /bæ˥-bi˥-ze˥/; /zɤ˥-bi˥-ze˥/; and /la˥-bi˥-ze˥/. The suffix /-ze/ is lowered to L in /dzu˥-ze˥/ ‘have eaten’, /dzu˥-bi˥-ze˥/ ‘will eat’, and /dzu˥-mɤ˥-bi˥-ze˥/ ‘will not eat’. The H tone of the verb exerts a lowering effect despite not being apparent in the surface-phonological form. A suffix separated from the verb by other suffixes is still sensitive to the lexical tone of the verb, even though this tone surfaces neither on the verb itself nor on its other suffixes.

The presence of tones that only manifest themselves in a restricted number of contexts is a salient characteristic of the Yongning Na tone system. The surface-phonological notation of ‘going to buy’ as /hwæ˥-bi˥/ and ‘going to eat’ as /dzu˥-bi˥/, with the same tone pattern, does not reflect the underlying presence of a H tone in the former phrase. The manifestation of the H tone of the verb is fairly roundabout: it does not lower a M-tone suffix (witness /dzu˥-bi˥/, ‘going to eat’), but it lowers the next syllable in the sequence /dzu˥-bi˥-ze˥/. Such complexities account for the length of this chapter, and of the present description of Na tone generally: they cannot be summarized through a small set of rules. The topic marker and the durative constitute further examples of the entrenched complexities of this system.

The topic marker and the durative

Some postverbal elements share a phonological characteristic: their tone pattern varies depending on the tone of the preceding verb, but a MH contour on the verb does not unfold onto them. The examples brought to light so far are: (i) the topic marker /-dzo/ (which also appears after nouns); (iii) the progressive /-dzo/; and (iv) the affirmative particle /mv/. The data for the topic marker are presented in Table 15, and the data for the PROGRESSIVE in Table 16. One difference emerges between these two expressions: for M-tone verbs, the TOPIC marker carries H tone, whereas the PROGRESSIVE carries M tone.

Table 15. The tonal behaviour of the topic marker

tone	ex.	gloss	V+TOP	NEG+V+TOP
<i>verbs</i>				
H	dzuŋ	to eat	dzuŋ-dzoŋ	mɤŋ-dzuŋ-dzoŋ
M _a	hwæŋ _a	to buy	hwæŋ-dzoŋ	mɤŋ-hwæŋ-dzoŋ
M _b	tɕ ^{hi} ŋ _b	to sell	tɕ ^{hi} ŋ-dzoŋ	mɤŋ-tɕ ^{hi} ŋ-dzoŋ
M _c	biŋ _c	to go	biŋ-dzoŋ	mɤŋ-biŋ-dzoŋ
L _a	bæŋ _a	to sweep	bæŋŋ-dzoŋ	mɤŋ-bæŋ-dzoŋ
L _b	zɯwɤŋ _b	to speak	zɯwɤŋŋ-dzoŋ	mɤŋ-zɯwɤŋ-dzoŋ
MH	laŋŋ	to strike	laŋŋ-dzoŋ	mɤŋ-laŋŋ-dzoŋ ²
<i>adjectives</i>				
H	biŋ	shallow	biŋ-dzoŋ	mɤŋ-biŋ-dzoŋ
M	tɕiŋ	sour	tɕiŋ-dzoŋ	mɤŋ-tɕiŋ-dzoŋ
L _a	hỹŋ _a	red	hỹŋŋ-dzoŋ	mɤŋ-hỹŋ-dzoŋ
L _b	dʒɤŋ _b	good	dʒɤŋŋ-dzoŋ	mɤŋ-dʒɤŋ-dzoŋ
MH	t ^h ɑŋŋ	sharp	t ^h ɑŋŋ-dzoŋ	mɤŋ-t ^h ɑŋŋ-dzoŋ

² It has been verified that the pattern *M.M.H is not acceptable for this combination: /*mɤŋ-laŋ-dzoŋ/.

Table 16. *Another postverbal elements over which a MH tone cannot unfold: the durative. (No semantically acceptable combination with a M_c-tone verb was found.)*

tone	ex.	gloss	DUR+V+PROG: ‘is currently V-ing’
H	dzuɿ	to eat	t ^{hi} ɿ-dzuɿ-dzoɿ
M _a	hwæɿ _a	to buy	t ^{hi} ɿ-hwæɿ-dzoɿ
M _b	tɕ ^{hi} ɿ _b	to sell	t ^{hi} ɿ-tɕ ^{hi} ɿ-dzoɿ
M _c	biɿ _c	to go	-
L _a	bæɿ _a	to sweep	t ^{hi} ɿ-bæɿ-dzoɿ
L _b	zɰɰɿ _b	to speak	t ^{hi} ɿ-zɰɰɿ-dzoɿ
MH	laɿɿ	to strike	t ^{hi} ɿ-laɿɿ-dzoɿ (*M.H.L)

A MH-tone verb preceding this morpheme is realized with a MH contour, e.g. /mɰɰɿ-laɿɿ ɿ-dzoɿ/ for ‘to strike’.

1.3.3. Toneless suffixes

The verb /mæɿ/ ‘to achieve’ carries M tone; however, when it appears in serial verb constructions, where it indicates that an action achieved its goal, its behaviour differs from that of the morphemes analyzed in the previous paragraph as having M tone. The perfective, /-zeɿ/, has the same tonal behaviour. The two morphemes /-mæɿ/ and /-zeɿ/ are therefore tentatively analyzed as toneless, for want of a better label.

The behaviour of toneless suffixes is recapitulated in Table 17. These tone patterns are in most respects like the M-tone suffixes described above (§1.3.2), but the pattern after a H-tone verb is M.L and not M.M.

Table 17. *The behaviour of toneless suffixes*

tone	example	gloss	perfective	to achieve
H	dzuɿ	to eat	dzuɿ-zeɿ	dzuɿ-mæɿ
M _a	hwæɿ _a	to buy	hwæɿ-zeɿ	hwæɿ-mæɿ
M _b	tɕ ^{hi} ɿ _b	to sell	tɕ ^{hi} ɿ-zeɿ	tɕ ^{hi} ɿ-mæɿ
L _a	bæɿ _a	to sweep	bæɿ-zeɿ	bæɿ-mæɿ
L _b	zɰɰɿ _b	to speak	zɰɰɿ-zeɿ	zɰɰɿ-mæɿ
MH	laɿɿ	to strike	laɿ-zeɿ	laɿ-mæɿ

1.3.4. MH-tone suffixes

All the MH-tone suffixes observed so far have the same tonal behaviour; this part of the system is relatively straightforward. Examples are provided in Table 18: the ABILITIVE, /kʷɪɫ/; the PERMISSIVE, /tʰaɫ/; and the CAUSATIVE /kʰuɫ/. Other MH-tone suffixes include the reported-speech particle /-tsuɫ/.

Table 18. The tonal behaviour of MH-tone suffixes, after verbs and adjectives.

tone	example	gloss	abilitive	permissive	causative
<i>verbs</i>					
H	dzuɫ	to eat	dzuɫ-kvɫ	dzuɫ-tʰaɫ	dzuɫ-kʰuɫ
M _a	hwæɫ _a	to buy	hwæɫ-kvɫɫ	hwæɫ-tʰaɫɫ	hwæɫ-kʰuɫɫ
M _b	tɕʰiɫ _b	to sell	tɕʰiɫ-kvɫɫ	tɕʰiɫ-tʰaɫɫ	tɕʰiɫ-kʰuɫɫ
L _a	bæɫ _a	to sweep	bæɫ-kvɫ	bæɫ-tʰaɫ	bæɫ-kʰuɫ
L _b	zʷɤɫ _b	to speak	zʷɤɫ-kvɫ	zʷɤɫ-tʰaɫ	zʷɤɫ-kʰuɫ
MH	laɫɫ	to strike	laɫ-kvɫ	laɫ-tʰaɫ	laɫ-kʰuɫ
<i>adjectives</i>					
H	biɫ	shallow	biɫ-kvɫ	biɫ-tʰaɫ	biɫ-kʰuɫ
M	tsʰiɫ	hot	tsʰiɫ-kvɫɫ	tsʰiɫ-tʰaɫɫ	tsʰiɫ-kʰuɫɫ
L _a	qʷuɫ _a	large	qʷuɫ-kvɫ	qʷuɫ-tʰaɫ	qʷuɫ-kʰuɫ
L _b	dʒɤɫ _b	good	dʒɤɫ -kvɫɫ	dʒɤɫ-tʰaɫ	dʒɤɫ-kʰuɫ
MH	tʰaɫɫ	sharp	tʰaɫ-kvɫ	tʰaɫ-tʰaɫ	tʰaɫ-kʰuɫ

zzzz difference between causative and abilitive for Lb-tone adjectives
dʒɤɫ-kvɫɫ different from: dʒɤɫ-kʰuɫ, verified in 2014

The phrase /dʒɤɫ kʰuɫ/ ('good'+CAUSATIVE) is in common use as a blessing on special occasions such as the New Year and the rite of passage into adulthood; it could be translated as 'Best wishes!' or 'Let there be good/happiness!' The phrases /qʷuɫ kʰuɫ/ ('large'+CAUSATIVE), /tsʰiɫ kʰuɫ/ ('hot'+CAUSATIVE) and /tʰaɫ kʰuɫ/ ('sharp'+CAUSATIVE) have a straightforward causative meaning: 'to enlarge', e.g. to increase the size of a farm by adding another building; 'to heat up'; and 'to sharpen'.

The MH tone surfaces as such after M; as a general rule, the M tone is known not to interfere with following tones. The MH tone is lowered to L after H: the H tone does not surface as such due to the neutralization of M and H in tone-group-initial position, but it is present underlyingly and lowers all following tones to L. A preceding L tone spreads over it

(/bæ↓/ > /bæ↓-kv↓/), as does the H part of a MH contour (/la↑↓/ > /la↑-kv↓/), delinking the MH tone on the suffix.

1.3.5. *A H-tone suffix: the relativizer/nominalizer /hĩ↓/*

The grammatical word /hĩ↓/ is analyzed here as a relativizer; since it is glossed as ‘nominalizer’ by Liberty Lidz (Lidz 2010, 183), the label adopted in the heading of this paragraph is ‘relativizer/nominalizer’, to avoid giving the wrong impression that those are two distinct morphemes.

This morpheme behaves in many tonal contexts like the M-tone postverbal particles conveying the immediate future (/bi↑/) and the experiential (/dzur↑/), but it cannot host the H part of a MH contour from the preceding verb: the result is M.M, e.g. /la↑-hĩ↓/ ‘...who strikes’, instead of the M.H pattern found for M-tone particles, e.g. /la↑-bi↑/ ‘...is going to strike’. The relativizer must therefore be considered to belong to a tonal category distinct from those labelled above as “L”, “M”, “MH”, and “toneless”. The choice of the label as H-tone suffix for the relativizer was made in view of the hypothesis that this morpheme grammaticalized from the word for ‘person, human being’, which has H tone: /hĩ↓/.

When associated with the relativizer /hĩ↓/, the adjectives in tone class L_b (such as /dzɤ↓_b/ ‘good’ and /na↓_b/ ‘black, dark’) have a tonal behaviour never observed on verbs, yielding a L.H pattern, as shown in Table 19. MH-tone adjectives also have a different behaviour from MH-tone verbs.

Table 19. *The tonal behaviour of H-tone suffixes*

word class	tone	example	gloss	relativizer
<i>verbs</i>	H	dzu↓	to eat	dzu↑-hĩ↓
	M _a	hwæ↑ _a	to buy	hwæ↑-hĩ↓
	M _b	tɕ ^h i↑ _b	to sell	tɕ ^h i↑-hĩ↓
	M _c	bi↑ _c	to go	bi↑-hĩ↓
	L _a	bæ↓ _a	to sweep	bæ↓-hĩ↓
	L _b	zɤwɤ↓ _b	to speak	zɤwɤ↓-hĩ↓
	MH	la↑↓	to strike	la↑-hĩ↓
<i>adjectives</i>	H	bi↓	shallow	bi↑-hĩ#↓
	M	tɕi↑	sour	tɕi↑-hĩ#↓
	L _a	hỹ↓ _a	red	hỹ↓-hĩ↓
	L _b	dzɤ↓ _b	good	dzɤ↓-hĩ↓
	MH	t ^h ɑ↑↓	sharp	t ^h ɑ↑-hĩ↓\$

1.4. Disyllabic suffixes

1.4.1. M.H tone

A first tonal category of disyllabic suffixes is illustrated by /-kwɿ-tɕuŋ/ ‘after; because’. This suffix mostly appears as a trisyllabic expression: /kwɿ-tɕuŋ-laŋ/. It is transcribed below with a hyphen before the syllable /-laŋ/ because this last syllable can be detached from the other two. In texts, out of 140 examples, ten are without /-laŋ/ (Lake3.54, 59, 67, Healing.37, Sister.34, Sister3.133, Caravans.80, 137, Renaming.18, and BuriedAlive2.48). Thus, while addition of /-laŋ/ (presumably meaning ‘and, also’) is a well-established habit, the expression can clearly be employed without it; no special nuance of meaning was found, except that the formulation without /la/ is apparently felt to be more pithy and economical. The monosyllabic form /kwɿ-/ cannot appear on its own.

Table 20. The tonal behaviour of /-kwɿ-tɕuŋ(-laŋ)/, ‘after; because’

tone	ex.	gloss	V+‘after; because’
<i>verbs</i>			
H	dzuŋ	to eat	dzuŋ-kwɿ-tɕuŋ(-laŋ)
M _a	hwæŋ _a	to buy	hwæŋ-kwɿ-tɕuŋ(-laŋ)
M _b	tɕi ^h iŋ _b	to sell	tɕi ^h iŋ-kwɿ-tɕuŋ(-laŋ)
M _c	biŋ _c	to go	biŋ-kwɿ-tɕuŋ(-laŋ)
L _a	bæŋ _a	to sweep	bæŋ-kwɿ-tɕuŋ(-laŋ)
L _b	zɿŋ _b	to speak	zɿŋ-kwɿ-tɕuŋ(-laŋ)
MH	laŋ	to strike	laŋ-kwɿ-tɕuŋ(-laŋ) / laŋ-kwɿ-tɕuŋ(-laŋ)
<i>adjectives</i>			
H	biŋ	shallow	biŋ-kwɿ-tɕuŋ(-laŋ)
M	tɕiŋ	sour	tɕiŋ-kwɿ-tɕuŋ(-laŋ)
L _a	hɿŋ _a	red	hɿŋ-kwɿ-tɕuŋ(-laŋ)
L _b	dɿŋ _b	good	dɿŋ-kwɿ-tɕuŋ(-laŋ)
MH	t ^h aŋ	sharp	t ^h aŋ-kwɿ-tɕuŋ(-laŋ)

The tone pattern of /kwɿ-tɕuŋ/ is deduced from its behaviour in association with the adjective /dɿŋ_b/ ‘good’. The observed pattern is /dɿŋ-kwɿ-tɕuŋ(-laŋ)/, which does not constitute a well-formed tone group since it contains two H tones. This must therefore be analyzed as a sequence of two full-fledged tone groups: /dɿŋ | -kwɿ-tɕuŋ(-laŋ)/. In this

context, the tones carried by /-kwɿ-tɕu/ must be supposed to be their lexical tones; as for /-la/, it receives L tone through Rule xyz (“”).

Under this hypothesis, the tone patterns in Table 15 could be explained as (i) for L-tone and M-tone verbs: spreading of the verb’s tone to the syllable /kwɿ/, leaving /tɕu/ unaffected; and (ii) for H-tone and MH-tone verbs: levelling down of the tones of /kwɿ-tɕu/ to L.

About variants with a rising contour before the suffix

The example /dʒɿŋ-kwɿ-tɕu-lə/ ‘because/since [it is] good’ discussed above illustrates the existence of cases in which a rising contour is realized on the verb, and does not unfold over the suffix. A second case in point is with MH-tone verbs, e.g. /laŋ-kwɿ-tɕu-lə/ ‘because/since [someone] beat [something]’. Variants in which the MH contour unfolds over the first syllable of the following morpheme (/mɿ-lə-kwɿ-tɕu-lə/) are considered acceptable, and there exists one example in a text (BuriedAlive2.48), but the majority case is with the MH contour sitting on the verb. This suggests that there is a tone group boundary after the verb, since contours are only realized tone-group-finally.

Such a behaviour would not be unparalleled: for instance, the topic-marker /-noŋ/ and the word /tʰiŋ/ ‘then’ always mark the beginning of a new tone group. This analysis would be consistent with the fact that there tends to be a pause before the morphemes at issue (the postverbal elements over which a MH tone cannot unfold): a perceptual pause, whose main acoustic cue is the lengthening of the rhyme of the preceding syllable. In early transcriptions, a comma was used to reflect this perceived pause, transcribing e.g. /lə-tsaŋ, | -kwɿ-tɕu/ ‘...because [they] rowed...’ (Lake3.59).

But after verbs bearing a tone other than MH, the tonal behaviour of these morphemes suggests that they are integrated within the same tone group. For instance, after a M-tone verb, the pattern is M.M.H, e.g. /hwæt-kwɿ-tɕu-lə/ ‘because [she/he] buys...’.

One possible way of handling this would be to postulate that the division into tone groups is influenced by the lexical tone of the words at issue: there would be one single tone group, e.g. /| hwæt-kwɿ-tɕu-lə/ |, ‘when [she/he] buys...’, except when the tone carries tone MH: /| laŋ | -kwɿ-tɕu-lə/ |, ‘when [she/he] strikes...’. But the tones of the postverbal elements are all lowered to L when following a MH-tone verb. Lowering to L after a preceding H tone level is a general rule in Na, operating within

the tone group, never across a tone-group juncture. The phonological fact that the sequence /-kwɿ.tɕu-lɑ/ is lowered to L after a MH-tone verb (e.g. /lɑɫɫ-kwɿ.tɕu-lɑ/ for ‘to strike’) strongly suggests that the expression /kwɿ.tɕu-lɑ/ does not make up an independent tone group. Moreover, the sequence /-kwɿ.tɕu-lɑ/ in /lɑɫɫ-kwɿ.tɕu-lɑ/ ‘when [she/he] strikes...’ is not a well-formed tone group, since it only contains L tones.

This special situation is analyzed here as the result of a stylistic process of emphasis, which then became habitually associated with certain morphemes. The analysis is set out in §xyz of Chapter xyzSynthesis_ToneRules.

1.4.2. M.L tone

Two categories of disyllabic suffixes have a tantalizingly similar behaviour. They are illustrated by /-koɫtoɫ/ ‘on/during/compared_to/to(wards)’ and /-pʰæɫdiɫ/ ‘as if’, as shown in Table 21. (Some of the combinations are attested in texts, including FoodShortage2.72 for H tone, Tiger.14 for L_a tone, BuriedAlive2.24 for L_b tone, and Dog2.108 for MH tone.)

Table 21. The behaviour of two disyllabic suffixes analyzed as carrying M.L tone

tone	example	gloss	V + /-pʰæɫdiɫ/ ‘as if’	V + /-koɫtoɫ/ ‘during’
H	dzuɫ	to eat	mvɫ-pʰæɫdiɫ	dzuɫ-koɫtoɫ
M _a	hwæɫ _a	to buy	hwæɫ-pʰæɫdiɫ	hwæɫ-koɫtoɫ
M _b	tɕʰiɫ _b	to sell	tɕʰiɫ-pʰæɫdiɫ	tɕʰiɫ-koɫtoɫ
L _a	bæɫ _a	to sweep	qʰwɿɫ-pʰæɫdiɫ	bæɫ-koɫtoɫ
L _b	zɰwɿɫ _b	to speak	doɫ-pʰæɫdiɫ	zɰwɿɫ-koɫtoɫ
MH	lɑɫɫ	to strike	kvɫ-pʰæɫdiɫ / kvɫ-pʰæɫdiɫ	lɑɫɫ-koɫtoɫ

The only difference between the two suffixes is found in association with H-tone verbs. This difference may be due to the internal structure of the disyllabic suffixes, with the /-di/ portion of /-pʰæɫdi/ behaving in a distinct way.

22 The verb phrase

1.5. Combinations between affixes

1.5.1. Suffixes preceded by the negation

It is common for a verb to be separated from a following suffix or suffixed verb by the negation, as in example (xyz):

(xyz) ...p^hvɪ-mɤɯ-t^hɑɪ-niɪ-hoɪ-mæɪ
p^hvɪɪ mɤ t^hɑɪɪ niɪ hoɪ mæɪ
to_take_off NEGATION to_be_possible CERT_STR FUT AFFIRM
“[I] was not able to take off [the bracelets]!” (BuriedAlive2.88)

One could expect the tonal behaviour of such expressions to be computed progressively (left-to-right) in some simple way. But as elsewhere in the system, no simple algorithm could be proposed that would account for all the data. A telling example is that of MH-tone verbs, such as /p^hvɪɪ/ ‘to take off’. In the example above, the H part of the MH contour reassociates to the negation, yielding /p^hvɪ-mɤɯ.../ and resulting in the lowering of all following tones to L (through rule xyz). When the suffix carries M tone, on the other hand, the H part of the MH contour is not present in the surface-phonological form, e.g. in /p^hvɪ-mɤɪ-biɪ/ ‘...will not take off...’. The data are therefore set out below in table form, rather than in the form of a set of rules.

M-tone suffixes or toneless suffixes (or suffixed verbs) preceded by the negation

Table 22 sets out the data for combinations in which the third syllable carries M tone (e.g. the morpheme expressing immediate future: /biɪ/) or is toneless (e.g. /mæɪ/ ‘to succeed, to achieve’).

Table 22. *The tone patterns of combinations between verb, negation and M-tone or toneless suffixes*

tone	example	gloss	‘will not V’ (M tone)	‘cannot manage to V’ (toneless)
H	dzuɿ	to eat	dzuɿ-mɿɿ-biɿ	dzuɿ-mɿɿ-mæɿ
M _a	hwæɿ _a	to buy	hwæɿ-mɿɿ-biɿ	hwæɿ-mɿɿ-mæɿ
M _b	tɕ ^h iɿ _b	to sell	tɕ ^h iɿ-mɿɿ-biɿ	tɕ ^h iɿ-mɿɿ-mæɿ
M _c	biɿ _c	to go	jiɿ-mɿɿ-biɿ	biɿ-mɿɿ-mæɿ
L _a	dzeɿ _a	to cut	dzeɿ-mɿɿ-biɿ	dzeɿ-mɿɿ-mæɿ
L _b	t ^h uɿ _b	to drink	t ^h uɿ-mɿɿ-biɿ	t ^h uɿ-mɿɿ-mæɿ
MH	t ^h æɿ	to bite	t ^h æɿ-mɿɿ-biɿ	t ^h æɿ-mɿɿ-mæɿ

Note that the verb used to illustrate the M_c tone category in the table is /jiɿ_c/ rather than /jiɿ_o/, to avoid the form /biɿ-mɿɿ-biɿ/, which is well-formed but weird-sounding.

MH-tone suffixes (or suffixed verbs) preceded by the negation

This paragraph deals with the construction /V-mɿɿ-t^hɑɿ/ ‘[one] must not V’, where /mɿɿ/ is the NEGATION and /t^hɑɿ/ means ‘possible’. The tone patterns are the same as in the constructions /V-mɿɿ-k^huɿ/ ‘not to let [someone] V’ and /V-t^hɑɿ-k^huɿ/ ‘do not let [someone] V’, where /-k^huɿ/ is the CAUSATIVE and /t^hɑɿ/ the PROHIBITIVE. Examples from texts include:

ləɿ-ʂuɿ-dzoɿ, | dʒiɿhɿ̃ | mɿɿ-mɿɿ-k^huɿ! |
 lə ʂuɿ dzoɿ dʒiɿhɿ̃\$ mɿɿ mɿɿ k^huɿ
 ACCOMP to_die PROG clothes to_put_on NEG CAUS
 ‘When someone dies, [we] do not clothe [the corpse]!’
 (BuriedAlive3.58)

soɿɿɿ-soɿhɿ̃ | qæɿ | -dzoɿ | t^hiɿ |, | ləɿ-qæɿ |, | mɿɿ-mɿɿ-t^hɑɿ!
 soɿɿɿ-soɿhɿ̃ qæɿ -dzoɿ t^hiɿ lə qæɿ
 3_days_and_nights to_burn TOP then ACCOMP to_burn
 mɿɿ mɿɿ t^hɑɿ
 consume/burn_up NEG possible
 ‘The corpse was burnt [on the pyre] for three days and three nights, but it was not possible to burn it up!’ (Sister3.93)

The tone patterns for all tone classes are shown in Table 23.

24 The verb phrase

Table 23. The tone patterns of /V-mɣ-tʰa/ 'one] must not V' and /V-tʰa-kʰu/ 'do not let [someone] V/do not cause to V'

tone	example	gloss	'[one] must not V'	'do not cause to V'
H	dzu	to eat	dzu-t-mɣ-tʰa	dzu-t-tʰa-kʰu
M _a	hwæt _a	to buy	hwæt-t-mɣ-tʰa	hwæt-t-tʰa-kʰu
M _b	tɕʰi _b	to sell	tɕʰi-t-mɣ-tʰa	tɕʰi-t-tʰa-kʰu
M _c	bi _c	to go	bi-t-mɣ-tʰa	bi-t-tʰa-kʰu
L _a	dze _a	to cut	dze-t-mɣ-tʰa	dze-t-tʰa-kʰu
L _b	tʰu _b	to drink	tʰu-t-mɣ-tʰa	tʰu-t-tʰa-kʰu
MH	tʰæt	to bite	tʰæt-t-mɣ-tʰa	tʰæt-t-tʰa-kʰu

The tones for /V-mɣ-kv/ '...cannot V' are entirely identical with those for /V-mɣ-tʰa/ 'one] must not V' and /V-tʰa-kʰu/ 'do not cause to V', as shown in Table 24.

Table 24. The tone patterns of /V-mɣ-kv/ '...cannot V'

	tone	example	gloss	'...cannot V/Adj'
<i>verbs</i>	H	dzu	to eat	dzu-t-mɣ-kv
	M _a	hwæt _a	to buy	hwæt-t-mɣ-kv
	M _b	tɕʰi _b	to sell	tɕʰi-t-mɣ-kv
	M _c	bi _c	to go	bi-t-mɣ-kv
	L _a	bæ _a	to sweep	bæ-t-mɣ-kv
	L _b	zɣwɣ _b	to speak	zɣwɣ-t-mɣ-kv
	MH	la	to strike	la-t-mɣ-kv
<i>adjectives</i>	H	bi	shallow	bi-t-mɣ-kv
	M	tsʰi	hot	tsʰi-t-mɣ-kv
	L _a	qɯ _a	large	qɯ-t-mɣ-kv
	L _b	dzɣ _b	good	dzɣ-t-mɣ-kv
	MH	tʰa	sharp	tʰa-t-mɣ-kv

(pour mémoire : formes affirmatives :

bi-t-kʰu
tsʰi-t-kʰu
qɯ-t-kʰu
dzɣ-t-kʰu
tʰa-t-kʰu)

L-tone suffixes (or suffixed verbs) preceded by the negation

The data are set out in Table 25.

Table 25. The tone patterns of the construction /N mɤ-ho/ '...will not V'

tone	example	gloss	'will not V'
H	dzuɿ	to eat	dzuɿ-mɤɿ-hoɿ
M _a	hwæɿ _a	to buy	hwæɿ-mɤɿ-hoɿ
M _b	tɕ ^h iɿ _b	to sell	tɕ ^h iɿ-mɤɿ-hoɿ
M _c	biɿ _c	to go	biɿ-mɤɿ-hoɿ
L _a	dzeɿ _a	to cut	dzeɿ-mɤɿ-hoɿ
L _b	t ^h uɿ _b	to drink	t ^h uɿ-mɤɿ-hoɿ
MH	t ^h æɿɿ	to bite	t ^h æɿ-mɤɿ-hoɿ

Comments

The above data can be commented as follows. The first syllable, the verb, can only receive one of two tones: L or M, due to its initial position. L-tone verbs appear with their lexical L tone, and all others (M, H and MH) surface with M tone.

Tone assignment on the second and third syllables does not obey a set of general rules. Some data subsets show regularities, however. When the first morpheme (the verb constituting the first syllable of the expression) has M tone, the tone of the third morpheme (that following the negation) surfaces as such. The M tone is neutral, in the sense that it does not spread or create any restriction on following tones. When the initial morpheme has H tone, on the other hand, this H tone precludes following H tones, even though it does not surface as such. This results in the deletion of a following MH tone. In the abstract, another possibility would be for the H part of the MH contour of the third syllable to be deleted. But the data show that Yongning Na treats lexical tones as unitary in this respect: either the MH tone is compatible with what precedes, and it surfaces; or it is not, and it is deleted. As for the cases where the initial morpheme has L tone, it is an open question why the L tone does not spread all the way to the third syllable, yielding /*dzeɿ-mɤɿ-t^huɿ/ 'one must not cut' (which would be realized on the surface as [dzeɿ-mɤɿ-t^huɿ], through the application of rule xyz). It does not seem to be the case that the H tone observed in /dzeɿ-mɤɿ-t^huɿ/ is what remains of the MH lexical tone after its initial portion (M) is removed: this process is unattested anywhere else in the language. Rather, it looks as if the MH tone of the third syllable were deleted, leaving it toneless. Rule xyz then results in assignment of a H tone to that syllable.

26 *The verb phrase*

1.5.2. *The neutralization of tonal oppositions on morphemes following the interrogative particle*

The interrogative particle is analyzed as carrying L tone. The data in Table 26 reveals a complete neutralization of tonal oppositions on the morphemes placed after the interrogative particle. The four morphemes shown in the table have different tones: /bi-/ has M tone; /ho-/ has L tone; and /t^hɑ-/ has MH tone. The tone patterns for /mæ-/ ‘to manage to’, are not shown in the table for reasons of space; they are entirely identical.

Table 26. *The tone pattern for V+interrogative+suffix*

tone	example	gloss	‘...going to V?’	‘will... V?’	‘can... V?’
H	dzuɿ	to eat	dzuɿ-əɿ-biɿ	dzuɿ-əɿ-hoɿ?	dzuɿ-əɿ-t ^h ɑɿ?
M _a	hwæɿ _a	to buy	hwæɿ-əɿ-biɿ	hwæɿ-əɿ-hoɿ?	hwæɿ-əɿ-t ^h ɑɿ?
M _b	tɕ ^h iɿ _b	to sell	tɕ ^h iɿ-əɿ-biɿ	tɕ ^h iɿ-əɿ-hoɿ?	tɕ ^h iɿ-əɿ-t ^h ɑɿ?
M _c	biɿ _c	to go	biɿ-əɿ-biɿ	biɿ-əɿ-hoɿ?	biɿ-əɿ-t ^h ɑɿ?
L _a	dzeɿ _a	to cut	dzeɿ-əɿ-biɿ	dzeɿ-əɿ-hoɿ?	dzeɿ-əɿ-t ^h ɑɿ?
L _b	t ^h uɿ _b	to drink	t ^h uɿ-əɿ-biɿ	t ^h uɿ-əɿ-hoɿ?	t ^h uɿ-əɿ-t ^h ɑɿ?
MH	t ^h æɿɿ	to bite	t ^h æɿ-əɿ-biɿ	t ^h æɿ-əɿ-hoɿ?	t ^h æɿ-əɿ-t ^h ɑɿ?

1.6. Nominalization

L-tone nominalizing suffix

The nominalizing suffix /-diɿ/ is analyzed as having L tone on the basis of its behaviour after M-tone verbs. However, it behaves differently from the L-tone tense-aspect-mood morphemes (§xyz): /dzuɿ-diɿ/ ‘food, things for eating’ vs. /dzuɿ-hoɿ/ ‘will eat’; /t^hæɿ-diɿ/ ‘thing to bite (e.g. toy given to teething babies)’ vs. /t^hæɿ-hoɿ/ ‘will bite’. The data are set out in Table 27.

Table 27. *The tonal behaviour of the nominalizing suffix /diɿ/*

tone	example	gloss	nominalizer	gloss
H	dzuɿ	to eat	dzuɿ-diɿ	thing to eat = food
M _a	hwæɿ _a	to buy	hwæɿ-diɿ	thing to buy, product
M _b	tɕ ^h iɿ _b	to sell	tɕ ^h iɿ-diɿ	thing to sell, commodity
L _a	dzeɿ _a	to cut	dzeɿ-diɿ	thing to cut = knife, etc.
L _b	t ^h uɿ _b	to drink	t ^h uɿ-diɿ	thing to drink = drinks
MH	t ^h æɿɿ	to bite	t ^h æɿ-diɿ	thing to bite (for infant, dog...)

As a dialectal aside, consultant M21 has different tone patterns for the $L_{(a, b)}$ tone: L.H (e.g. /dzeɫ-diɫ/ and /tʰuɫ-diɫ/), and not L.L. This might result from an analogy with the morpheme indicating completion, /-seɫ/, which takes H tone after a L-tone verb (§xyz).

1.7. Combinations of adjectives with grammatical morphemes

1.7.1. The reduplication of adjectives

Although adjectives behave as stative verbs from the point of view of their lexical tone categories, they do not replicate in the same way. Adjectives are intensified by suffixation of a reduplicated syllable that does not carry any meaning of its own. For instance, /bæɫaɫ~laɫ/ ‘limp, flabby (e.g. of meat without bones)’ and /bæɫ-ɛwæɫ~ɛwæɫ/ ‘loose (of knot)’ point to the existence of an adjective /*bæɫ/ ‘loose, limp’; in the present state of the language, this root is attested neither on its own, nor in reduplicated guise (expected form, on the analogy of verbs: /*bæɫ~bæɫ/). There are two variants for ‘short (of persons)’: /toɫtuɫ/ and /toɫtuɫ~tuɫ/; it is not clear at present whether the disyllable is a shortened version of the trisyllable or the other way round.

1.7.2. Demonstrative and intensive constructions

In Na, in addition to the construction with the RELATIVIZER/NOMINALIZER /hĩ/, adjectives are often used in demonstrative or intensive constructions. The demonstrative construction ‘this ADJ’ (‘this big’, ‘this thick...’) is /tʰuɫ- ADJ -gɣɫ/, where /tʰuɫ/ is the proximal demonstrative, and /gɣɫ/ indicates the degree of a quality (compare /tʰuɫ | noɫ | niɫgɣɫ | ʂwæɫ-mɣɫ-gɣɫ/ ‘his nose is not as high as yours’). All tonal oppositions on the adjective are neutralized, e.g. /tʰuɫ-dæɫ-gvɫ/ ‘this short’, from /dæɫ/; /tʰuɫ-hwɣɫ-gvɫ/ ‘this broad’, from /hwɣɫ/; /tʰuɫ-tɕiɫ-gvɫ/ ‘this small’, from /tɕiɫ/; and /tʰuɫ-toɫ-gvɫ/ ‘this deep’, from /toɫ/ (e.g. Sister.28, BuriedAlive3.144). The adjective can be reduplicated, e.g. /tʰuɫ-dɕuɫ~dɕuɫ-gvɫ/ ‘this big’ (Agriculture.55), from /dɕuɫ/ ‘big’ (see also FoodShortage.43, 85).

Other constructions include: DEM+ADJ+the AUGMENTATIVE /mi/, e.g. /tʰuɫ-ʂwæɫ-miɫ-zoɫ/ ‘this tall’, where /zoɫ/ is an ADVERBIALIZER (Dog.12); the intensive construction /qʰaɫ-ADJ-miɫ/ ‘so ADJ’, e.g. /qʰaɫ-dɕuɫ-miɫ-hĩɫ/

‘thus huge, extremely big’ (Lake3.28), where /hĩ/ is the RELATIVIZER/NOMINALIZER.

Tonal oppositions are likewise neutralized in the construction ‘as ADJ (as)’, /t^hɑ̃-*reduplicated adjective*-gṽ/: /t^hɑ̃-d̪æ̃l~d̪æ̃l-gṽ/ ‘as short’; /t^hɑ̃-hw̃ɣ̃l~hw̃ɣ̃l-gṽ/ ‘as broad’; /t^hɑ̃-t̪ɕĩl~t̪ɕĩl-gṽ/ ‘as small’; and /t^hɑ̃-ɬõl~ɬõl-gṽ/ ‘as deep’.

2. Object and non-prefixed verb

The association of an object and a verb could in theory be ambiguous with that between a subject and a verb, since the suffix that forces an interpretation of a noun as subject (/~n̪u/) is not compulsory. Different tone rules applying in subject+verb sequences and object+verb sequences could be one of the means to disambiguate, but in practice subject+verb sequences are relatively uncommon, and disambiguation is generally effected through context.

When eliciting object-verb combinations, great care was exercised to avoid occasional reinterpretations as subject-verb combinations. For instance, the association of ‘wolf’ and ‘to eat’ immediately suggests agent role for ‘wolf’, for semantic reasons. A subject noun phrase was added to force an interpretation that corresponds to the desired pattern with ‘wolf’ as object: ‘the tiger ate the wolf’, /lɑ̃l-n̪ũl | ɔ̃l dṽl dzũl-zẽl/.

2.1. The facts

Table 28 presents the tone rules that apply in object+verb sequences. The corresponding recordings are available online: (i) some combinations between monosyllables: Tone_Verb1, and (ii) a full set, except for L_b-tone verbs: Tone_Verb2. The resulting tone patterns are the same for lexical disyllables and for numeral-plus-classifier phrases: for instance, combinations with /d̪ũl-k^hw̃ɣ̃l\$/ ‘a piece’ yield the same tone patterns as those with /d̪zĩ-h̃ɣ̃l\$/ ‘clothes’.

The notation adopted in the table requires disambiguation for sequences ending in a M tone, namely M.M and L.M: object+verb sequences realized with one of these patterns in isolation may have different underlying patterns. For instance, /lĩl hw̃æ̃l/ ‘to buy tea’ and /æ̃l hw̃æ̃l/ ‘to buy chicken’, both with L.M pattern, yield different results with a following PERFECTIVE suffix, /-zẽl/: /...lĩl hw̃æ̃l-zẽl/ ‘...bought tea’, as against /...æ̃l

hwæɫ-zeɫ/ ‘...bought chicken’. The table therefore contains information on the tonal realization of a following PERFECTIVE suffix, /-ze/, where relevant: the tone pattern of ‘to buy tea’, an example of the combination of input tones LH (on the noun) and M (on the verb), is transcribed in the table as L.M+L, and that of ‘to buy chicken’ simply as L.M. The pattern M.M+L is likewise distinguished from M.M+M. The tone of the suffix is preceded by a ‘+’ sign.

On the other hand, in the cases where the tone of the suffix results straightforwardly from the general rules of tone association of Yongning Na (§xyz), no information is indicated in the table. These cases are the following: when the last tone of the object+verb phrase is H, /-ze/ always carries L tone; when it is L, /-ze/ always carries L tone; and when it is MH, /-ze/ receives the H part of the contour.

Finally, as in the other tables, a slash separates variants. For instance, for ‘...has sold panthers’ (LH+M_b), it is possible to say /zæɫ tɕʰiɫ-zeɫ/, as well as /zæɫ tɕʰiɫ-zeɫ/. For L+M_b, two patterns are possible: L.L, and M.M+M: /joɫ tɕʰiɫ-zeɫ/ ‘...has sold sheep’ and /kʰuɫ tɕʰiɫ-zeɫ/ ‘...has sold thread’, as well as /joɫ tɕʰiɫ-zeɫ/ and /kʰuɫ tɕʰiɫ-zeɫ/. For LH+H, two patterns are also possible: L.L, and L.H, e.g. /diɫ dvɫ-zeɫ/ ‘...has dug earth’, and /(laɫ-ŋuɫ) tʰaɫ dzuɫ-zeɫ/ ‘(the tiger) has eaten (a) buffalo’, as well as /diɫ dvɫ-zeɫ/ and /(laɫ-ŋuɫ) tʰaɫ dzuɫ-zeɫ/.

Table 28. *The tone patterns of object+verb combinations.*

verb→ noun ↓	H	M _a	M _b	L _a	L _b	MH
<i>Monosyllabic nouns</i>						
LM	L.M+L	L.M+M	L.M+M	L.M+L	L.M+L	L.MH
LH	L.L / L.H	L.H	L.L / L.H	L.H	L.H / L.L	L.MH
M	M.M+L	M.M+M	M.M+M	M.L	M.L	M.MH
L	L.L	M.M+M	M.M+M / L.L	L.L	L.L / M.L	L.L
H	M.M+L	M.L	M.M+L	M.H	M.MH	M.L
MH	M.H	M.H	M.H	M.H	M.MH	M.H
<i>Disyllabic nouns</i>						
M	M.M.M+ L	M.M.M+ M	M.M.M+ M	M.M.L	M.M.L	M.M.MH
#H	M.M.M+ L	M.M.L	M.M.M+L	M.M.H	M.M.MH	M.M.L
MH#	M.M.MH	M.M.H (H#)	M.M.MH	M.M.H	M.M.MH	M.M.H
H\$	M.M.M+ L	M.H.L	M.M.M+L	M.M.H	M.M.MH	M.H.L
L	L.L.L	L.L.H	L.L.L	L.L.H	L.L.L	L.L.H
L#	M.L.L	M.L.L	M.L.L	M.L.L	M.L.L	M.L.L
LM+MH#	L.M.M+L	L.M.H	L.M.M+L	L.M.H	L.M.MH	L.M.H
LM+#H	L.M.M+L	L.M.L	L.M.M+L	L.M.H	L.M.L / L.M.MH ³	L.M.L
LM	L.M.M+L	L.M.M+M	L.M.M+M	L.M.L	L.M.L	L.M.MH
LH	L.H.L	L.H.L	L.H.L	L.H.L	L.H.L	L.H.L
H#	M.H.L	M.H.L	M.H.L	M.H.L	M.H.L	M.H.L

2.2. Usefulness of eliciting object-verb combinations to distinguish the LM and LH categories of verbs

The LM and LH categories of nouns are neutralized in most contexts. Among object-verb combinations, two contexts distinguish them: their association with a M-tone verb, e.g. /boɭ hwæt-zeɭ/ ‘...bought pigs’ vs.

³ The L.M.MH variant was added in 2014. Examples include /nvɭtɕ^hiɭ doɭ/~/nvɭtɕ^hiɭ doɭ/ ‘to see (plant sp.)’, /piɭtiɭ doɭ/~/piɭtiɭ doɭ/ ‘to see nuggets (of gold)’, and /naɭhĩɭ doɭ/~/naɭhĩɭ doɭ/ ‘to see (the) Naxi’. The consultant seems to prefer the L.M.MH realization.

/zæ↓ hwæ↓-ze↓/ ‘...bought leopards’, and with a H-tone verb, e.g. /ɣw↓ dzu↓/ ‘to eat skin’ vs. /bo↓ dzu↓/ ‘to eat pigs’.

2.3. About tonal variants

There are interesting fine details in the use of tonal variants. Any L-tone monosyllabic noun acting as object of a L_b-tone verb can yield a L.L pattern: for instance, /ɬi↓ ʒi↓/ ‘to grab/seize a roebuck’, /mv↓ ʒi↓/ ‘to grab/seize (a/one’s) daughter’; and /ɬi↓ do↓/ ‘to see a roebuck’, /mv↓ do↓/ ‘to see (a/one’s) daughter’. On the other hand, the M.L variant is only observed for some nouns: it is possible to say /ɬi↓ ʒi↓/ ‘to grab/seize a roebuck’ and /ɬi↓ do↓/ ‘to see a roebuck’, but not /*mv↓ ʒi↓/ (intended meaning: ‘to grab/seize (a/one’s) daughter’) or /*mv↓ do↓/ (intended meaning: ‘to see (a/one’s) daughter’).

In some cases, it is possible to distinguish among variants one that is more common for frequently occurring combinations of words. For instance, with a L-tone object and a LM-tone verb, there are two variants: M.M+M and L.L, but it is customary to say /dzu↓ tʰu↓/ ‘to drink water’, and /dzu↓ tʰu↓/, though understandable, sounds weird. Conversely, the elicited phrase ‘to grab sheep’ yields /jo↓ ʒi↓/; the variant /jo↓ ʒi↓/ carries a hint that this is a common activity, which is slightly weird from a semantic point of view. The latter variant can make sense in the context of sheep shearing, for instance, where sheep-grabbing is part of the shearing process.

2.4. Exceptional combinations

Two LH nouns, ‘leopard’ and ‘monkey’, yield a L.M+L pattern in combination with a H-tone verb, instead of the expected L.L pattern: /zæ↓ dzu↓-ze↓/ for ‘[the tiger] ate panthers’ and /ʒi↓ dzu↓-ze↓/ for ‘[the tiger] ate monkeys’, instead of the expected /*zæ↓ dzu↓-ze↓/ and /*ʒi↓ dzu↓-ze↓/. The combination of ‘to eat’ and ‘panther’ is semantically odd, as panthers are predators rather than game, but that with ‘monkeys’ is fine, and the same result was obtained in several elicitation sessions. This is provisionally considered as an exceptional pattern: another of the complexities that need to be learnt individually.

In Table 28, two variants were indicated for the combination of a LH noun and a M_b verb: L.L / L.H. For some combinations, both patterns are acceptable: for ‘...has sold panthers’, it is possible to say /zæ↓ tɕʰi↓-ze↓/, as well as /zæ↓ tɕʰi↓-ze↓/. But some other combinations have apparently

lexicalized with one or the other: ‘to bring in the harvest’ can only be /bæ↓ ʂo↓-ze↓/, not /*bæ↓ ʂo↓-ze↓/, whereas ‘to eat skin’ (with the same input tones) can only be /yuu↓ dzuu↓-ze↓/, not /*yuu↓ dzuu↓-ze↓/. It may be that combinations tend to receive a L.H pattern as they lexicalize; sporadic tone change accompanying lexicalization is well-attested in the Laze language, for instance. Or it may be that L.H is an older pattern, and is therefore more common on lexicalized combinations, whereas L.L is an innovative pattern.

Another exception corresponding to a highly lexicalized combination is /k^hɣ↓ ʂæ↓/ ‘to hunt’, literally ‘to lead a dog’, from /k^hɣ↓/ ‘dog’ and /ʂæ↓/ ‘to lead along’. The productive, regular pattern would yield /*k^hɣ↓ ʂæ↓/. This irregularity may be interpreted as a lexicalized remnant of an earlier tone pattern.

The word /mv↓/ ‘fire’ in association with /ts^hi↓/ ‘to light’ yields /mv↓ ts^hi↓/ ‘to light a fire’, instead of the expected /mv↓ ts^hi↓/.

The demonstratives, /t^hʂu↓/ and /t^hɣ↓/, do not behave like other H-tone words, as shown in example (xyz).

(xyz) t ^h ʂu↓ ts ^h uu↓-ze↓ !		
t ^h ʂu↓	ts ^h uu↓	ze
3sg	to _arrive	PFV
‘(S)he has arrived!’		

The subject and verb belong to distinct tone groups, whereas full lexical words such as /zɰæ↓/ ‘horse’ yield M.MH: /zɰæ↓ ts^huu↓/ ‘the horse arrives’.

The demonstratives are exceptional items in other respects too, as explained in section xyz of Chapter xyz (association with /-ŋu↓/).

The word /tso↓tso#↓/ ‘object, thing, thingummy’ is also irregular: ‘to see things’ (in a literal sense, not ‘to hallucinate’) is /tso↓~tso↓ do↓/, with M.M.MH tone, instead of the expected M.M.L (variant: M.M.M).

example	gloss	resulting phrase	pattern	expected for Lb
boɭɬ	pig	boɭ doɬ		L.M+L
zæɭɬ	leopard	zæɭ doɬ	L.H	L.H / L.L
laɬ	tiger	laɬ doɭ	M.L	M.L
joɭ	sheep	joɭ doɭ		L.L / M.L
zɰwæɬ	horse	zɰwæɬ doɬ		M.MH
tʂʰæɬɬ	deer	tʂʰæɬ doɬ		M.MH
poɬloɬ	ram	poɬloɬ doɬ; qurɬ- bæɬ doɬ, qæɬdoɬ doɬ	M.M.L	M.M.L
zɰwæɬzo#ɬ	colt	zɰwæɬzoɬ doɬ; tsoɬ~tsoɬ doɬ		M.M.MH
hwɰɬliɬɬ	cat	hwɰɬliɬ doɬ		M.M.MH
kyɬʂeɬʂ	flea	kyɬʂeɬ doɬ; qurɬ- kʰwɰɬ doɬ		M.M.MH
hwæɬtʂæɬ	squirrel	hwæɬtʂæɬ doɬ		M.H.L
kʰvɬmiɬ	dog	kʰvɬmiɬ doɬ		L.L.L
daɬjiɬ	mule	daɬjiɬ doɬ		M.L.L
õɬdvɬɬ	wolf	õɬdvɬ doɬ		L.M.MH
nvɬtɕʰi#ɬ	plant sp.	nvɬtɕʰiɬ doɬ		
boɬmiɬ	sow	boɬmiɬ doɬ		L.M.L
boɬtaɬ	boar	boɬtaɬ doɬ		L.H.L

verb→ noun ↓	H	M _a	M _b	L _a	L _b	MH
<i>Monosyllabic nouns</i>						
LM	L.M+L	L.M+M	L.M+M	L.M+L	L.M+L	L.MH
LH	L.L / L.H	L.H	L.L / L.H	L.H	L.H / L.L	L.MH
M	M.M+L	M.M+M	M.M+M	M.L	M.L	M.MH
L	L.L	M.M+M	M.M+M / L.L	L.L	L.L / M.L	L.L
H	M.M+L	M.L	M.M+L	M.H	M.MH	M.L
MH	M.H	M.H	M.H	M.H	M.MH	M.H
<i>Disyllabic nouns</i>						
M	M.M.M+ L	M.M.M+ M	M.M.M+ M	M.M.L	M.M.L	M.M.MH
#H	M.M.M+ L	M.M.L	M.M.M+L	M.M.H	M.M.MH	M.M.L
MH#	M.M.MH	M.M.H (H#)	M.M.MH	M.M.H	M.M.MH	M.M.H
H\$	M.M.M+ L	M.H.L	M.M.M+L	M.M.H	M.M.MH	M.H.L
L	L.L.L	L.L.H	L.L.L	L.L.H	L.L.L	L.L.H
L#	M.L.L	M.L.L	M.L.L	M.L.L	M.L.L	M.L.L
LM+MH#	L.M.M+L	L.M.H	L.M.M+L	L.M.H	L.M.MH	L.M.H
LM+#H	L.M.M+L	L.M.L	L.M.M+L	L.M.H	L.M.L	L.M.L
LM	L.M.M+L	L.M.M+M	L.M.M+M	L.M.L	L.M.L	L.M.MH
LH	L.H.L	L.H.L	L.H.L	L.H.L	L.H.L	L.H.L
H#	M.H.L	M.H.L	M.H.L	M.H.L	M.H.L	M.H.L

2.5. Nouns plus the copula /ni_a/ behave tonally like object-verb combinations

Data on the behaviour of the copula after each tonal class of nouns were set out in Table xyz1 of Chapter xyz_Essentials. It coincides exactly with the behaviour of L_a-tone verbs in object+verb combinations. It does not correspond with the behaviour of L_a-tone verbs in subject+verb combinations. This observation about tones is relevant to the study of the morphosyntactic status of the copula.

3. Object and prefixed verb

When an object associates to a prefixed verb, they can form a single tone group, as in (xyz1), or the prefixed verb may be preceded by a tone group boundary, as in (xyz).

(xyz1) $z\ddot{u}t \mid d\ddot{u}t-q^h w\ddot{x}t \mid t^h i\ddot{l}-p^h \ddot{y}J-tsuJ-m\ddot{y}J$
 $z\ddot{u}t \quad d\ddot{u}t \quad q^h w\ddot{x}t \mid \quad t^h i- \quad p^h \ddot{y}t \mid \quad -tsu\ddot{l}-m\ddot{y}$
 wine one clf.bowl DUR to_pour REP AFFIRM
 ‘...it is said that [she] poured a bowl of wine [for her brother].’
 (Sister3.41)

(xyz2) $\ddot{a}t-m\ddot{y}t-\eta\ddot{u}J \mid z\ddot{a}JsuJ \mid t^h i\ddot{l}-m\ddot{y}t$
 $\ddot{a}t-m\ddot{y}t \mid \quad \eta\ddot{u} \quad z\ddot{a}JsuJ \quad t^h i\ddot{l} \quad m\ddot{y}t_a$
 elder_sibling A coarse_felt DUR to_put_on/to_wear
 ‘the elder brother put on [his] coarse felt cloak’
 (Sister3.57)

When the object and prefixed verb are integrated into a single tone group, it seems at first glance as if the adjustment were purely phonological, the computation of tones within the group proceeding from the beginning (‘left-to-right’). In example (xyz1), for instance, it looks as if the MH contour on the numeral-plus-classifier unfolded over the prefixed verb: / $d\ddot{u}t-q^h w\ddot{x}t \mid$ / ‘one bowl(ful)’ plus / $t^h i\ddot{l}-p^h \ddot{y}t \mid$ / ‘to pour’ would be analyzed as yielding / $d\ddot{u}t-q^h w\ddot{x}t \mid t^h i\ddot{l} \dots$ / by unfolding of the MH contour, the H part of the noun phrase’s MH contour reassociating to the syllable / $t^h i-$ /. The final result / $d\ddot{u}t-q^h w\ddot{x}t \mid t^h i\ddot{l}-p^h \ddot{y}J$ / would obtain by application of Rules 4 and 5: “A syllable following a H-tone syllable receives L tone”, and “All syllables following a HL or ML sequence receive L tone”. This type of analysis can be extended to almost all cases – but not quite all of them, leading to the conclusion that the adjustment is not purely phonological. The association of an object and a prefixed verb therefore still belongs within morphophonology, although only a small evolutionary step would be required for it to become a purely phonological process: simplifying the handful of forms that do not currently obtain on the basis of phonological rules. The facts are set out and discussed in detail below.

3.1. The facts

The data are presented below tone by tone. The behaviour of tones Ma and Mb is identical, as is that of tones La and Lb; the data presented are therefore limited to one single M-tone verb (Table 29) and one single L-tone verb (Table 31). The patterns that do not conform with the regularities discussed below (§xyz) are set in bold.

Table 29. *Objects plus M-tone verbs prefixed by the durative /t^{hi}-/*

tone	head	meaning	hwæ- _a 'to buy'	tone pattern
LM	boɫɪ	pig	boɫ t ^{hi} ɪ- <i>hwæ</i> ɪ	L.M.M
LH	mvɪɪ	daughter	mvɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	L.H.L
M	laɪ	tiger	laɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	M.M.M
L	joɪ	sheep	joɪ t^{hi}ɪ-<i>hwæ</i>ɪ	M.M.M
#H	hɪɪ	human being	hɪɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	M.L.L
MH#	ts ^h uɪɪ	goat	ts ^h uɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	M.H.L
M	poɪloɪ	ram	poɪloɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	M.M.M.M
#H	zɪwæɪzo#ɪ	colt	zɪwæɪzoɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	M.M.L.L
MH#	hwɪɪliɪɪ	cat	hwɪɪliɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	M.M.H.L
H\$	kvɪʒeɪ\$	flea	kvɪʒeɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	M.H.L.L
L	k ^h vɪmiɪ	dog	k ^h vɪmiɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	L.L.H.L
L#	daɪjiɪ	mule	daɪjiɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	M.L.L.L
LM+MH#	vɪts ^h ɪɪɪ	vegetables	vɪts ^h ɪɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	M.M.H.L
LM+#H	ɑɪmi#ɪ	goose	ɑɪmiɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	L.M.L.L
LM	boɪmiɪ	sow	boɪmiɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	L.M.M.M
LH	boɪɬɑɪ	boar	boɪɬɑɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	L.H.L.L
H#	k ^h vɪnaɪ	dog	k ^h vɪnaɪ t ^{hi} ɪ- <i>hwæ</i> ɪ	M.H.L.L

Table 30. *Objects plus H-tone verbs prefixed by the durative /t^{hi}-/*

tone	head	meaning	dzuŋ 'to eat'	tone pattern
LM	boɭɬ	pig	boɭ tʰiɬ-dzuŋ	L.M.H
LH	mvɭɭ	daughter	mvɭ tʰiɭ-dzuɭ	L.H.L
M	laɬ	tiger	laɬ tʰiɬ-dzuŋ	M.M.H
L	joɭ	sheep	joɭ tʰiɭ-dzuɭ	L.L.LH
#H	hiɭ	human being	hiɬ tʰiɭ-dzuɭ	M.L.L
MH#	tsʰuɬɭ	goat	tsʰuɬ tʰiɭ-dzuɭ	M.H.L
M	poɬloɬ	ram	poɬloɬ tʰiɬ-dzuŋ	M.M.M.H
#H	zɰwæɬzo#ɭ	colt	zɰwæɬzoɬ tʰiɭ-dzuɭ	M.M.L.L
MH#	hwɣɬliɬɭ	cat	hwɣɬliɬ tʰiɭ-dzuɭ	M.M.H.L
H\$	kvɬseɭ\$	flea	kvɬseɭ tʰiɭ-dzuɭ	M.H.L.L
L	kʰvɭmiɭ	dog	kʰvɭmiɭ tʰiɭ-dzuɭ	L.L.H.L
L#	daɬjiɭ	mule	daɬjiɭ tʰiɭ-dzuɭ	M.L.L.L
LM+MH#	vɭtsʰɣɬɭ	vegetables	vɭtsʰɣɬ tʰiɭ-dzuɭ	L.M.H.L
LM+#H	aɭmi#ɭ	goose	aɭmiɬ tʰiɭ-dzuɭ	L.M.H.L
LM	boɭmiɬ	sow	boɭmiɬ tʰiɬ-dzuŋ	L.M.M.H
LH	boɭɬaɭ	boar	boɭɬaɭ tʰiɭ-dzuɭ	L.H.L.L
H#	kʰvɬnaɭ	dog	kʰvɬnaɭ tʰiɭ-dzuɭ	M.H.L.L

Table 31. Objects plus L-tone verbs prefixed by the durative /tʰi-/

tone	head	meaning	doɭ _b 'to see'	tone pattern
LM	boɭɬ	pig	boɭ tʰiɬ-diɭ	L.M.L
LH	mvɭɭ	daughter	mvɭ tʰiɭ-diɭ	L.L.H
M	laɬ	tiger	laɬ tʰiɬ-diɭ	M.M.L
L	joɭ	sheep	joɬ tʰiɬ-diɭ	M.M.L
#H	hiɭ	human being	hiɬ tʰiɬ-diɭ	M.M.H
MH#	tsʰuɬɭ	goat	tsʰuɬ tʰiɬ-diɭ	M.M.H
M	poɬloɬ	ram	poɬloɬ tʰiɬ-diɭ	M.M.M.L
#H	zɰwæɬzo#ɭ	colt	zɰwæɬzoɬ tʰiɬ-diɭ	M.M.M.H
MH#	hwɣɬliɬɭ	cat	hwɣɬliɬ tʰiɬ-diɭ	M.M.M.H
H\$	kvɬseɭ\$	flea	kvɬseɬ tʰiɬ-diɭ	M.M.M.H
L	kʰvɭmiɭ	dog	kʰvɭmiɭ tʰiɬ-diɭ	L.L.L.H
L#	daɬjiɭ	mule	daɬjiɭ tʰiɬ-diɭ	M.L.L.L
LM+MH#	vɭtsʰɣɬɭ	vegetables	vɭtsʰɣɬ tʰiɬ-diɭ	L.M.M.H
LM+#H	aɭmi#ɭ	goose	aɭmiɬ tʰiɬ-diɭ	L.M.M.H
LM	boɭmiɬ	sow	boɭmiɬ tʰiɬ-diɭ	L.M.M.L
LH	boɭɬaɭ	boar	boɭɬaɭ tʰiɬ-diɭ	L.H.L.L
H#	kʰvɬnaɭ	dog	kʰvɬnaɭ tʰiɬ-diɭ	M.H.L.L

Table 32. *Objects plus MH-tone verbs prefixed by the durative /tʰi-/*

tone	head	meaning	tʰæɿɿ 'to bite'	tone pattern
LM	boɿɿ	pig	boɿ tʰiɿ-tʰæɿɿ	L.M.MH
LH	mvɿɿ	daughter	mvɿ tʰiɿ-tʰæɿɿ	L.H.L
M	laɿ	tiger	laɿ tʰiɿ-tʰæɿɿ	M.M.MH
L	joɿ	sheep	joɿ tʰiɿ-tʰæɿɿ	L.L.LH
#H	hɿɿ	human being	hɿɿ tʰiɿ-tʰæɿɿ	M.L.L
MH#	tsʰuɿɿ	goat	tsʰuɿ tʰiɿ-tʰæɿɿ	M.H.L
M	poɿloɿ	ram	poɿloɿ tʰiɿ-tʰæɿɿ	M.M.M.MH
#H	zɿwæɿzo#ɿ	colt	zɿwæɿzoɿ tʰiɿ-tʰæɿɿ	M.M.L.L
MH#	hwɿɿliɿɿ	cat	hwɿɿliɿ tʰiɿ-tʰæɿɿ	M.M.H.L
H\$	kvɿʃeɿɿ	flea	kvɿʃeɿ tʰiɿ-tʰæɿɿ	M.H.L.L
L	kʰvɿmiɿ	dog	kʰvɿmiɿ tʰiɿ-tʰæɿɿ	L.L.H.L
L#	daɿjiɿ	mule	daɿjiɿ tʰiɿ-tʰæɿɿ	M.L.L.L
LM+MH#	vɿtsʰɿɿɿ	vegetables	vɿtsʰɿɿ tʰiɿ-tʰæɿɿ	L.M.H.L
LM+#H	aɿmi#ɿ	goose	aɿmiɿ tʰiɿ-tʰæɿɿ	L.M.L.L
LM	boɿmiɿ	sow	boɿmiɿ tʰiɿ-tʰæɿɿ	L.M.M.MH
LH	boɿɿaɿ	boar	boɿɿaɿ tʰiɿ-tʰæɿɿ	L.H.L.L
H#	kʰvɿnaɿ	dog	kʰvɿnaɿ tʰiɿ-tʰæɿɿ	M.H.L.L

Examples in texts are abundant: the prefix /tʰi-/ alone appears over 700 times in twenty texts, illustrating a broad range of combinations: see for instance FoodShortage.71; Funeral.69, 108, 190, 238, 253; Healing.103; Housebuilding.40, 110, 121, 217, 239; Mountains.7, 88, 161; Reward.40, 73; Seeds2.51, 62; and Sister3.41, 95.

3.2. Data analysis

The most straightforward cases are presented first, followed by the more complex ones.

3.2.1. *The tone of the verb expresses itself when the noun phrase has tone LM or M*

As observed in §xyz2.3 of Chapter xyzN_LexicalTone, M behaves as an inert tone in Yongning Na: it does not spread or otherwise affect following tones. The behaviour of M-tone nouns in association with a prefixed verb is

in keeping with this observation: when the noun phrase has tone M, the prefixed verb surfaces with the same tones as in isolation. The same is true of LM-tone noun phrases.

3.2.2. Tonal oppositions on verbs are neutralized after a disyllabic noun phrase with tone L#, LH and H#

Tones L#, LH and H# on disyllables preclude any tone other than L on syllables that follow within the tone group, by application of Rules 4 and 5: “A syllable following a H-tone syllable receives L tone”, and “All syllables following a HL or ML sequence receive L tone”. All tonal oppositions on verbs are therefore neutralized after a disyllabic noun phrase carrying one of these three tones.

3.2.3. Comments on patterns that cannot be fully explained on a phonological basis

The patterns discussed in the two preceding paragraphs can be explained fully on a phonological basis. This is not true of the other patterns, however: while most of them make good phonological sense, others do not. Overall, three combinations out of four can be obtained on the basis of a simple set of phonological rules. This figure appears high enough to hypothesize that these rules do exist and are applied by the speakers, and that the remaining cases are instances of irregular morphotonology and are learnt individually. (Partly regular morphological paradigms are cross-linguistically widespread; this issue will be taken up again in the typological discussion.)

These rules are as follows.

(i) Tone LH on a monosyllabic noun projects its H portion onto the next syllable, /^{hi}i/. The pattern with L-tone verbs, exemplified by /mvɿ t^{hi}iɿ-dɔɿ/ ‘to see (a/the) daughter’, must be viewed as irregular.

(ii) Tones #H and LM+#H do not overtly express their H tone, which remains floating, but is not deleted: this floating H tone lowers the tones of the following syllables to L. The pattern with L-tone verbs is, again, irregular, as well as the pattern for a LM+#H noun and a H-tone verb, where one would expect *L.M.L.L, e.g. /*aɿmiɿ t^{hi}iɿ-dzuɿ/ ‘to eat a goose’, instead of the observed L.M.M.H: /aɿmiɿ t^{hi}iɿ-dzuɿ/.

(iii) Tone H\$ gets docked on the last syllable of the noun phrase, resulting in a lowering of the tone of following syllables to L, by Rules 4 and 5:

“A syllable following a H-tone syllable receives L tone”, and “All syllables following a HL or ML sequence receive L tone”.

(iv) Tones MH# and LM+MH# project their final H level onto the following syllable. The pattern with L-tone verbs is, again, irregular.

The behaviour of L-tone nouns is not straightforward. In view of the fact that many of the phonologically unexpected patterns are found with L-tone verbs, one could take the other patterns as regular: for disyllables, the pattern is L.L.H.L; for monosyllables, no generalization emerges with any clarity.

3.2.4. *The behaviour of L-tone verbs: attempting a generalization*

L-tone verbs are those that exhibit the greatest proportion of irregular patterns: patterns that do not obey the regularities brought out above. It appears possible to attempt a generalization nonetheless. One way to describe what happens in this particular morphosyntactic context is to say that *when the noun phrase contains a H tone, this H tone moves all the way to the last syllable of the resulting verb phrase, unless it is unmovably fixed to one of the syllables within the noun phrase*.

This generalization reflects the identical tonal treatment of the prefixed verb after a disyllable with tone H# or LH. When a H# or LH tone is lexically associated to a disyllabic noun, a H tone is unmovably attached to the last syllable of the noun. On the other hand, tones #H, LM+#H, H\$, MH# and LM+MH# share the property of containing a H level tone whose segmental anchoring depends on context: their H level is not unmovable.

An apparent counterexample to this generalization is tone LH: disyllabic LH-tone nouns yield L.H.L.L, but monosyllabic LH-tone nouns yield L.L.H, e.g. /mvɪ tʰiɪ-doʔ/ ‘to see (a/the) daughter’. At this point, one may consider that this difference of treatment demonstrates clearly that the tonal morphology at play here is irregular, and the analyst should refrain from devising clever accounts that are more systematic and neater than the facts. The above regularity would then be abandoned.

Experience in learning and speaking the language suggests otherwise, however, and encourages the investigator to go further down the slippery slope of building intuitive explanations for observed patterns. The different treatment of LH tone on monosyllabic and disyllabic nouns could be related to the fact that, although the tonal category is identical, its association to syllables is perceptibly different depending on the noun’s length. In the

case of disyllables, the H part of the LH tone is unmovably attached to the second syllable of the noun, making this tone category an easy one for the language learner. In the case of monosyllables, on the other hand, for want of a sufficient number of tone-bearing units there is some pressure for the H part to reassociate to a later syllable; in quite a few morphosyntactic contexts, the H part of LH does not surface on the noun to which it is lexically associated. Said differently, there is a hard-and-fast syllabic anchoring for tone LH when it associates to a disyllable, whereas on a monosyllable its anchoring is looser. Viewed in this light, it does not come as a great surprise that LH on a monosyllabic noun should pattern as one of the movable H tones – alongside with #H, LM+#H, H\$, MH# and LM+MH# – rather than as one of the unmovable H tones.

This generalization is ad hoc, in the sense that it is simply based on the data for this specific morphosyntactic context. But it does not appear absurd to consider that it has psychological reality, allowing learners to memorize the patterns for tones #H, LM+#H, H\$, MH# and LM+MH# – plus LH-tone monosyllables – all at one go.

Still on a highly speculative note, this analysis predicts dialectal variation on this point: in a neighbouring dialect, or even in the idiolect of another member of the same family or community, the behaviour of LH on monosyllables and disyllables could be identical, and ‘to see (a/the) daughter’ would accordingly be realized as /mvɿ tʰiɿl-doɿ/. High cross-dialect variation can be predicted for L-tone verbs generally: the force of analogy would tend to simplify the system by eliminating those cases that do not conform to the regularities set out in §xyz above. This is an empirical question for studies of other dialects to investigate.

4. Interrogative pronoun and verb

yyyy (to write as subsection of ‘object and verb’?) This section yyyy is not integrated to ‘object and verb’ because of certain phonological specificities...?

Table 33. *The tonal behaviour of three interrogative pronouns preceding a verb: /zeɭbæɿ/ ‘which’, /zeɭgɣɿ/ ‘which place’, and /zoɭqoɿ/ ‘where’*

tone	example	gloss	which	which place	where
H	dzuɿ	to eat	zeɭbæɿ dzuɿ?	zeɭgɣɿ dzuɿ?	zoɭqoɿ dzuɿ?
M _a	hwæɿ _a	to buy	zeɭbæɿ hwæɿ?	zeɭgɣɿ hwæɿ?	zoɭqoɿ hwæɿ?

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M _b	tɕ ^h iɿ _b	to sell	zeɭbæɿ tɕ ^h iɿ?	zeɭgɣɿ tɕ ^h iɿ?	zoɭqoɿ tɕ ^h iɿ?
L _a	bæɿ _a	to sweep	zeɭbæɿ bæɿ?	zeɭgɣɿ bæɿ?	zoɭqoɿ bæɿ?
L _b	t ^h uɿ _b ;	to drink;	zeɭbæɿ t ^h uɿɿ?	zeɭgɣɿ t ^h uɿ?	zoɭqoɿ t ^h uɿ?
	zɰɣɿ _b	to speak	zeɭbæɿ zɰɣɿɿ?	zeɭgɣɿ zɰɣɿ?	zoɭqoɿ zɰɣɿ?
MH	laɿɿ	to strike	zeɭbæɿ laɿ?	zeɭgɣɿ laɿ?	zoɭqoɿ laɿ ?

Note: the tonal differences between the three pronouns have been carefully checked. For instance, it has been verified that /*zeɭbæɿ laɿɿ/ is not an acceptable variant, any more than /*zeɭgɣɿ laɿɿ/.

5. Subject and verb

Tonal interaction between subject and verb is illustrated by (2-3).

- (2) a. biɿ giɿ-zeɿ.
 biɿ giɿ ze
 snow fall PFV
 ‘It is snowing./It’s beginning to snow.’
- b. hiɿ giɿ-zeɿ.
 hiɿɿ giɿ ze
 rain fall PFV
 ‘It is raining./It’s beginning to rain.’
- (3) a. hĩɿbæɿ ts^huɿɿ-zeɿ.
 hĩɿbæɿ#ɿts^huɿ ze
 guest arrive PFV
 ‘The guest has arrived./The guests have arrived.’
- b. daɿpɣɿ ts^huɿɿ-zeɿ.
 daɿpɣɿ ts^huɿɿ ze
 priest arrive PFV
 ‘The priest has arrived./The priests have arrived.’

Subject-plus-verb sequences are relatively infrequent in Na. This is due in part to the high frequency of nominal suffixes and verbal prefixes, and, for transitive verbs, to the subject-object-verb word order. When the verb is

preceded by a particle, such as the accomplished /lə-/ or the durative /t^hi-/, the noun and the verb belong to two different tone groups, and no interaction takes place. Compare, for instance, the realizations of the MH-tone verb /qæɪɪ/ 'to burn' in /mvɪɪ | ləɪ-qæɪ-zeɪ/ 'the fire burned' and /mvɪɪ qæɪ/ 'the fire burns'.

The elicited data analyzed in this section are based on intransitive verbs, so as to avoid possible confusions between subject+verb and object+verb constructions. Following the same procedure as for nouns, two contexts were used to arrive at underlying tone categories: subject+verb, and subject+verb+PFV. For instance, (3a) without the PFV yields /hɪɪ-bæɪ ts^huɪɪ/; the tone pattern obtained through this combination of subject and predicate can therefore be described as M.M.MH, and further analyzed as MH#: a MH contour associating to the last syllable.

5.1. The facts

For systematic elicitation, the following verbs were used: /sɯɪɪ/ 'to die'; /ts^ho#ɪ/ 'to dance'; /seɪ/ 'to walk'; /ts^huɪɪ/ 'to arrive'; /zɯɣɪɪ/ 'to speak'; and /bæɪɪ/ 'to run'. The nouns used were kinship terms and animal names, such as those used in Tables xyz and xyz. Table 34 presents the results. The LM and LH patterns on monosyllables always yield the same output; they are pooled together in the table.

When the subject-plus-verb combination ends in a H or L tone, the PERFECTIVE suffix carries L tone. When it ends in a MH tone, the suffix receives the H part of the contour. When it ends in a M tone, the tone of the suffix cannot be predicted; in those cases, it is indicated after a '+' sign.

The recording ToneSubjectVerb contains all of the combinations in Table 34, with their tones transcribed as in this table.

Table 34. *The tone patterns of subject-plus-verb combinations, in surface-phonological transcription.*

verb→ noun ↓	H	M _a	M _b	L _a	L _b	MH
<i>Monosyllabic nouns</i>						
LM, LH	L.H	L.M+M	L.M+M	L.H	L.H	L.MH
M	M.M+L	M.M+M	M.M+M	M.L	M.L	M.MH
L	M.M+L	L.L	M.M+M	L.L	L.L / M.L	L.L
H	M.M+L	M.M+L	M.M+L	M.MH	M.MH	M.L
MH	M.H	M.H	M.H	M.MH	M.MH	M.H
<i>Disyllabic nouns</i>						
M	M.M.M+L	M.M.M+M	M.M.M+M	M.M.L	M.M.L	M.M.MH
#H	M.M.M+L	M.M.M+L	M.M.M+L	M.M.MH	M.M.MH	M.M.L
MH#	M.M.MH	M.M.MH	M.M.MH	M.M.MH	M.M.MH	M.M.H
H\$	M.M.M+L	M.M.M+L	M.M.M+L/ M.M.M+H	M.M.MH	M.M.MH	M.H.L
L	L.L.L	L.L.L	L.L.L	L.L.L	L.L.L	L.L.H
L#	M.L.L	M.L.L	M.L.L	M.L.L	M.L.L	M.L.L
LM+MH#	L.M.M+L	L.M.M+L	L.M.M+L	L.M.MH	L.M.MH	L.M.H
LM+#H	L.M.M+L	L.M.M+M	L.M.M+M	L.M.L	L.M.MH	L.M.MH
LM	L.M.M+L	L.M.M+M	L.M.M+M	L.M.L	L.M.L	L.M.MH
LH	L.H.L	L.H.L	L.H.L	L.H.L	L.H.L	L.H.L
H#	M.H.L	M.H.L	M.H.L	M.H.L	M.H.L	M.H.L

About one fourth of the tone patterns for subject-plus-verb structure differ from the corresponding object-plus-verb combination. Among identical combinations are those where the noun has a L# or H# tone, since these fixed-position tones lower the tones of all following syllables to L.

As other types of combinations, such as numeral plus classifier and object plus verb, the tone patterns in Table 34 cannot be obtained on the basis of a set of general tone rules. Among the more surprising patterns is LH plus LM, as in /boJɬaɪ tʰuɪ-zeɪ/ 'the boar drank'. The noun has a LH tone, after which one would expect a neutralization of all tonal contrasts on the verb; the five other combinations do indeed yield L.H.L, but that with a LM-tone verb yields L.M.MH. This pattern is conspicuously unrelated to the language's general tone rules.

In subject-verb combinations as elsewhere, the L.M and L.H sequences are neutralized on the surface. Notation as L.H, which is interchangeable with L.M.L, was chosen for the sake of descriptive simplicity: it requires only two tone symbols, and it corresponds to one of the tones attested on disyllabic nouns.

5.2. How the suffix acquires its L, M or H tone after a M-tone verb

A challenge raised by the data in Table 34 concerns the analysis of how the suffix acquires its L, M or H tone after a M-tone verb. Three different types of sequences are observed: ...M+L, as in /laɪ seɪ-zeɪ/ ‘the tiger walked’ (input: M and H); ...M+M, as in /laɪ ʃuɪ-zeɪ/ ‘the tiger died’ (input: M and M); and ...M+H, in one single case: the combination of a H\$-tone subject and a #H-tone verb, as in /hwɔɪmiɪ tsʰoɪ-zeɪ/ ‘the she-cat jumped’.

This issue will be addressed from two perspectives: first, a flatly synchronic point of view (§4.1.1xyz), then from a dynamic point of view, considering the ...M+H pattern as an innovation.

5.2.1. A flatly synchronic approach, positing floating L tones

In view of the data set out in §xyz, the perfective suffix is analyzed as toneless: /ze/. Among the three cases found in subject-verb constructions (M tone, H tone and L tone), that in which the suffix carries M tone is the simplest: the suffix does not receive any tone assignment from what precedes, and receives M by default. The underlying tone category for the subject+verb combination can therefore be analyzed as M in the case of M.M+M (for monosyllabic nouns) and M.M.M+M (for disyllabic nouns); and as LM in the case of L.M+M (for monosyllabic nouns) and L.M.M+M (for disyllabic nouns).

Cases where the suffix receives H tone look like typical examples of the floating H tone, #H. This tone, which does not surface in isolation but can be manifested on a following syllable, is frequently observed in Na; it is the lexical tone of the class of nouns to which ‘little brother’ belongs (realization of the noun in isolation: /giɪzuɪ/ ‘little brother’, realization of the noun when followed by the copula: /giɪzuɪ ɲi/ ‘...is little brother’, as explained in §xyz of ChapterxyzLexicalTones).

As for cases where the suffix receives a L tone, from a flatly synchronic point of view, an analytical possibility is to consider that the L tone on the suffix in /laɪ seɪ-zeɪ/ ‘the tiger walked’ is #L: a floating Low tone, parallel to #H, the floating H tone. The resulting analysis is set out in Table 35.

Table 35. Analysis of the tones of subject-verb combinations, positing floating L tones.

noun ↓ ; verb →	H	M _a	M _b	L _a	L _b	MH
LM, LH	LH	LM	LM	LH	LH	LM+MH#
M	#L	M	M	M.L	M.L	M.MH
L	#L	L	M	L	L	L
H	#L	#L	#L	MH#	MH#	L#
MH	H#	H#	H#	MH#	MH#	H#
M	#L	M	M	#L	#L	MH#
#H	#L	#L	#L	MH#	MH#	#L
MH#	MH#	MH#	MH#	MH#	MH#	#L
H\$	#L	#L	#H / #L	MH#	MH#	H#
L	L	L	L	L	L	L+H#
L#	L#°	L#°	L#°	L#°	L#°	L#°
LM+MH#	LM°+#H	LM°+#H	LM°+#H	LM+MH#	LM+MH#	LM+H\$
LM+#H	LM°+#H	LM°	LM°	LH°	LM+MH#	LM+MH#
LM	LM°+#H	LM°	LM°	LH°	LH°	LM+MH#
LH	LH°	LH°	LH°	LH°	LM+MH#	LH°
H#	H#°	H#°	H#°	H#°	H#°	H#°

Floating L tones are not observed anywhere else in Na, however, which makes an analysis as #L ad hoc and unattractive. Also, given the high frequency of the floating H tone, #H, it would be surprising for a floating L tone to be restricted to one single corner of the tone system. Before an additional phonological category is posited, it may be useful to take a closer look at the data. A reexamination at the data from an evolutionary perspective sheds light on cases where the suffix carries H tone, which appear as innovations; in turn, this leads up to a less paradoxical analysis for cases where the suffix carries L tone.

5.2.2. *A dynamic approach to synchrony: ...M+H as an innovation*

It was already noted in §xyz of Chapter xyz that tone H\$ shows signs of variability: it is the lexical tone for which there is the greatest number of variants in its combinations with other tones, in various morphosyntactic contexts. In subject+verb combinations, its association with a #H-tone verb allows for two possibilities, M.M.M+L and M.M.M+H. The latter tonal string, M.M.M+H, is not attested in any of the other subject-verb combinations. A hypothesis suggested by this distribution is that this variant is an innovation: it filled a slot that was empty in the surface-phonological forms.

Such structural gap-filling causes a change in the phonological system, as when an allophone has drifted far enough away from its original pronunciation for a new combination to settle in. For instance, in Narua the sound [ɤ] was originally an empty-onset filler. For instance, the /ɤo/ in /a.ɤo/ ‘house’ is reconstructed as a simple *o at the Proto-Naish stage; it remains phonemically onsetless to this day in Laze ([aɭwuɭ], phonemically /aɭuɭ/) and in Naxi ([miɭwuɭ], phonemically /miɭuɭ/). The hardening of the phonetic onset of /o/ in Na resulted in the creation of the combination [ɤo] in surface forms, at which point there remained no [o] or [wo] syllables. Later, this phonetic slot was filled by syllables with other origins (e.g. the 1st-person collective pronoun [woɭ=ɭɭ], phonemically /oɭ=ɭɭ/). This resulted in the phonemicization of what was originally an empty-onset-filler: the /ɤo/ in /a.ɤo/ ‘house’ must now be analyzed as composed of two phonemes, initial /ɤo/ (now contrasting with the absence of an initial consonant) and the vowel /o/.

Returning to the variant tone pattern M.M.M+H on Subject+Verb+PERFECTIVE combinations, under the hypothesis that it represents an innovation, prior to this innovation the M.M.M+L pattern could be analyzed as #H, where the floating H tone was not manifested directly but triggered a lowering of following tones – in this instance, a lowering of the tone of the PERFECTIVE suffix. This state of affairs is reflected in the analysis in Table 36, which leaves out the problematic variant M.M.M+H for the H\$-plus-#H combination.

Table 36. Analysis of the tones of subject-verb combinations, positing that tone #H is reflected in the lowering of the tone of the suffix, and deliberately leaving aside the M.M.M+H variant of the H\$-plus-#H combination.

noun ↓ ; verb →	H	M _a	M _b	L _a	L _b	MH
LM, LH	LM	LM	LH	LH	LH	LM+MH#
M	M	M	#H	M.L	M.L	M.MH
L	L	M	#H	L	L	L
H	#H	#H	#H	MH#	MH#	L#
MH	H#	H#	H#	MH#	MH#	H#
M	M	M	#H	#H	#H	MH#
#H	#H	#H	#H	MH#	MH#	#H
MH#	MH#	MH#	MH#	MH#	MH#	#H
H\$	#H	#H	#H	MH#	MH#	H#
L	L	L	L	L	L	L+H#
L#	L#°	L#°	L#°	L#°	L#°	L#°
LM+MH#	LM°+#H	LM°+#H	LM°+#H	LM+MH#	LM+MH#	LM+H\$
LM+#H	LM°	LM°	LM°+#H	LH°	LM+MH#	LM+MH#
LM	LM°	LM°	LM°+#H	LH°	LH°	LM+MH#
LH	LH°	LH°	LH°	LH°	LM+MH#	LH°
H#	H#°	H#°	H#°	H#°	H#°	H#°

Table 36 can be said to constitute a reconstruction of the set of tone rules that applied in subject+verb constructions before the appearance of the M.M.M+H variant. For this reconstructed stage (which is likely to have very little time depth: presumably less than a couple of generations), a tone rule must be specified to the effect that #H tone in subject-verb combinations does not surface, but depresses following tones to L. In view of the general architecture of the Na tone system, this rule is not simply an ad hoc device to explain away an unaccountable observation: a rule to the same effect operates in other specific morphosyntactic contexts.

Now that this variant has settled in, however, its simplest phonological interpretation is as a floating H tone, #H, as mentioned above (§xyz4.1.1). This interpretation causes an in-depth modification in the system: as the #H slot in the phonological system comes to be occupied by the new, innovative form, the pattern M...+L, which could previously be analyzed as #H, requires a new interpretation. The argument made above (§xyz4.1.1) is that the simplest analysis in view of the entire system is as L# (a floating L tone), which thus enters the language's tone system.

Devoting the whole of the present section to the discussion of one isolated tonal variant may seem disproportionate. This variant appeared highly interesting, however, insofar as it illustrates the constant tension between underlying forms and surface-phonological forms, shedding light on types of evolution taking place in level-tone systems. From the point of view of surface-phonological forms, the innovative form discussed here can be viewed in the light of a simplification: at the (hypothetical) conservative stage presented in Table 36, for the H\$ plus M_b combination there is a H tone in the input, and none in the output; in the innovative form, on the other hand, there is an output H tone reflecting the input H, creating a better fit between input and output. From the point of view of underlying forms, on the other hand, the new combination is problematic, creating an analytical puzzle for language learners and linguists alike. Cases like this one allow for several analytical options and hence hold potential for diachronic change.

5.3. Variants resulting from a division into two tone groups

Some deviant patterns are observed in recorded data, when the association of subject and verb is, as it were, incomplete: both the subject and the verb receive the tone that they would have in isolation, e.g. ‘the tiger jumped’ can be realized as /laɪ | ts^hoɪ-zeɪ/ (tone pattern: M.M+M) instead of the regular /laɪ ts^hoɪ-zeɪ/. This amounts to a division into two tone groups, as transcribed by the vertical bar |. These are borderline cases, however, without a true division into two tone groups: if the two parts (the subject on the one hand, the verb plus its prefixes on the other) were really treated as two tone groups, a postlexical H tone would be added to all-L groups such as the subject /boɪ/ in /boɪ | ts^hoɪ-zeɪ/ ‘the pig jumped’ and the verb phrase /ts^huɪ-zeɪ/ in /joɪ | ts^huɪ-zeɪ/ ‘the sheep arrived’.

These variants are possible for all combinations, and are therefore not indicated in Table 34. When subject and verb are thus separated, it is possible to make a pause before the verb. The stylistic effect is to emphasize the subject. The topic of stylistic options in the division of the utterance into tone groups, which has considerable importance in Na prosody, is addressed in §xyz of ChapterxyzSynthesis.

5.4. Nouns plus the existential verb /dzoŋ_b/ behave tonally like subject-verb combinations

The existential verb /dzoŋ_b/ patterns like other L_b-tone verbs. The association of a noun and the existential behaves tonally like the combination of a subject and a verb (shown in Table 34 above). The data are shown in Table 37.

Table 37. *The tone of the existential verb /dzoŋ_b/ in association with a noun.*

example	meaning	tone	with existential	tone pattern
boŋ	pig	LM	boŋ dzoŋ(-zeŋ)	L.H
zæŋ	leopard	LH	zæŋ dzoŋ(-zeŋ)	L.H
laŋ	tiger	M	laŋ dzoŋ	L.M
joŋ	sheep	L	fiŋ dzoŋ	M.L
zɰæŋ	horse	H	zɰæŋ dzoŋ	M.MH
tʂ ^h æŋ	deer	MH	tʂ ^h æŋ dzoŋ	M.MH
qɣŋmiŋ	fox	M	qɣŋmiŋ dzoŋ	M.M.L
zɰæŋzo#ŋ	colt	#H	zɰæŋzoŋ dzoŋ	M.M.MH
hwɣŋliŋ	cat	MH#	hwɣŋliŋ dzoŋ	M.M.MH
hwɣŋmiŋ\$	she-cat	H\$	hwɣŋmiŋ dzoŋ	M.M.MH
k ^h vŋmiŋ	dog	L	k ^h vŋmiŋ dzoŋ	L.L.L
daŋjiŋ	mule	L#	daŋjiŋ dzoŋ	M.L.L
õŋdvŋ	wolf	LM+MH#	õŋdvŋ dzoŋ	L.M.MH
naŋhĩ#ŋ	Naxi	LM+#H	naŋhĩŋ dzoŋ	L.M.MH
boŋmiŋ	sow	LM	boŋmiŋ dzoŋ	L.M.L
boŋtaŋ	boar	LH	boŋtaŋ dzoŋ	L.H.L
hwæŋtsuŋ	rat	H#	hwæŋtsuŋ dzoŋ	M.H.L

A subtle difference between the existential verb /dzoŋ_b/ and other L_b-tone verbs is that the association of other verbs with a L-tone subject noun yields L.L, with a M.L variant for some nouns only, whereas the existential verb only allows the M.L pattern (for all nouns carrying lexical L tone).

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Chapter 8

Sentence-final particles

In Yongning Na as in numerous East Asian languages, sentence-final particles play a major role in conveying evidentiality and speaker attitude.

1. Why the tones of sentence particles seldom surface in texts

The tone of the sentence particle is often imposed by the tones that precede. If the tone group contains a H tone, or a M.L sequence, all following tones are lowered to L, through Rules xyz and xyz. For instance, the tone of final particle /mæ/ (expressing obviousness) is lowered to L in /tʃeɪ-tʃʰuɪ | ləɪ-ɕæɪ-niɪ-mæ/ 'the earth is fertilized' (Agriculture.54) because all tones following the M.L sequence /ləɪ-ɕæɪ/ (ACCOMP+'rich') are lowered to L by a phonological rule. This is the majority case. In other cases, the final particle receives a H tone projected by a contour tone lexically attached to the preceding syllable, as in /zæɪsuɪ | dzoɪ | tʃʰuɪ-niɪ | tʰiɪ-mɪɪ-kɪɪ-mæ/ (Sister3.74) 'This is how we used to wear felt', where the high tone on the affirmative /mæ/ is due to reassociation of the H part of the MH contour of the ABILITIVE /kɪɪ/.

It is only after transcribing ten texts, containing more than 150 examples of /-mæ/, that this particle was finally observed in a context where the preceding syllables do not impose a tone on it: /hoɪmiɪ-tʃʰæɪɪuɪ | tʰuɪɪ | ləɪ-qʰwɪɪ-zeɪ-mæɪ | / '[nowadays, the diseased person] drinks medicines for the stomach, and [they] are healed, aren't they!' (Healing.66). The phrase /ləɪ-qʰwɪɪ-zeɪ/ (ACCOMP-heal-PFV) does not contain any contour or floating tone that would project itself on a following syllable, and it does not contain the sequences H.L or M.L which would impose a L tone on following syllables. The tone carried by the sentence particle /mæ/ in this context makes it clear that it does not carry a L, H or MH tone, and it can therefore be interpreted as either toneless or carrying M tone.

Likewise, the tone of the reported-speech particle /tsuɪɪ/ is affected by the tones that precede it within the tone group in a vast majority of cases. In a set of ten narratives, its realization with MH tone on the surface is observed in only eight cases out of more than three hundred. For such cases, elicitation proved a highly valuable complement to observations from

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recorded texts. As for the affirmative final particle /mv/, its lexical tone simply could not be arrived at, because it only occurs after the reported-speech particle /tsuɿʈ/, so that its tone is always determined by the context.

2. L-tone final particles

The following final particles are hypothesized to have L tone: [xxxx, xxxx, LIST TO BE EXPANDED] and /moɿ/, conveying invitation.

The final particle /moɿ/ cannot appear right after the verb, in a /V+moɿ/ construction. Invitation is expressed as /ɖʷɿʈ-V-ɿɿ moɿ/: DELIMITATIVE+V+INCHOATIVE+final particle. This can be translated as: ‘Please go ahead and V a little!’ For instance: /ɖʷɿʈ-dzuɿ-ɿɿ moɿ/ ‘Please have some/please eat some [of it]!’ Table 1 shows the facts.

Table 1. The tone patterns of the /ɖʷɿʈ-V-ɿɿ moɿ/ construction

tone	example	gloss	/ɖʷɿʈ-V-ɿɿ moɿ/
H	dzuɿ	to eat	ɖʷɿʈ-dzuɿ-ɿɿ moɿ
M _a	hwæɿ _a	to buy	ɖʷɿʈ-hwæɿ-ɿɿ moɿ
M _b	tɕʰiɿ _b	to sell	ɖʷɿʈ-tɕʰiɿ-ɿɿ moɿ
L _a	bæɿ _a	to sweep	ɖʷɿʈ-bæɿ-ɿɿ moɿ
L _b	zʷɿɿ _b	to speak	ɖʷɿʈ-zʷɿɿ-ɿɿ moɿ
MH	laɿ	to strike	ɖʷɿʈ-laɿ-ɿɿ moɿ

The particle /moɿ/ carries L tone in all cases. With verbs with H, L and MH tones, this L tone carried by the particle derives phonologically from the tonal sequence that precedes. Within a tone group, a syllable following a H tone can only have L tone (as is the case after H and MH tones); likewise, a syllable following a M.L sequence can only carry L tone. In the case of M tones, however, the preceding tone sequence (M.M.M) does not impose such a phonological constraint: it allows any of L, M, H or MH on the final syllable. The L tone observed on the surface is therefore to be attributed to the lexical specification of the particle, hence its analysis as carrying a lexical L tone.

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Chapter 9

Tone assignment rules and the division of the utterance into tone groups

The present chapter is devoted to a recapitulation of (i) the rules of tone assignment, whereby surface-phonological tones can be derived from the underlying tones, and (ii) the principles underlying the division of the utterance into tone groups, a key unit for tonal processes.

The only morphophonological processes observed in Na are tonal. Na does not have segmental rules such as the lenition of word-medial consonants observed in other languages of the area, e.g. Qiang (LaPolla and Huang 2003, 31–32) and Shixing (Chirkova 2009, 12–13), which provide evidence for the phonological word as a metrical domain. The tone group is the only prosodic domain above word-level for which there is phonological evidence. In a model of prosodic hierarchy such as the universal model proposed by Selkirk (1986) and Nespor and Vogel (1986), made up of Utterance → Phrase → Intonational Phrase → Phonological Phrase → Phonological Word → Foot → Syllable → Mora, tone groups may be considered as constituting one *phonological phrase* each. The term ‘tone group’ is nonetheless used here in preference to ‘prosodic phrase’, as the defining characteristic of this phonological unit is that it serves as the domain of tonal processes.

The Yongning Na tone system comprises a host of rules that are specific to certain morphosyntactic contexts, as set out in the preceding chapters. This large set of rules constitutes the core of the tonal morphology of Yongning Na, and represents the bulk of what language learners must acquire to master the tone system of Na. Different rules apply in the association of a verb with a subject or an object, the association of two nouns into a compound, that of a numeral and classifier, or that of a word and its affixes, for instance. Several of these rules may come into play to determine the surface pattern of a tone group, as in (xyz):

(xyz) dzu˥ | dzu˥-q^hv-t^hv-t^hi˥-k^hu˥
dzu˥ dzu˥-q^hv-t^hv# t^hi k^hu˥
water 1-clf:hornful dur to_put

2 *Tone assignment rules and the division of the utterance into tone groups*

‘[People who travel all day] put a horn of water [in their bag, so as to have something to drink]’ (Tiger2.51)

In example (xyz), the noun ‘water’ constitutes a tone group on its own. The second tone group contains five syllables: /q̥uɪ-qʰvɪtʰvɪ tʰiɪ-kʰuɪ/. First, the tone of the numeral-plus-classifier phrase is determined, following the table-lookup rules set out in Chapter xyz, “Numeral-plus-classifier phrases”. This yields /q̥uɪ-qʰvɪtʰvɪ#ɿ/ ‘one hornful’ (ox horns used to serve as containers for water). Association of this object with the prefixed verb /tʰiɪ-kʰuɪɿ/ ‘to put (into)’ yields the final, M.M.M.L.L pattern, again on the basis of table lookup: see §xyz3 of Chapter xyzP, “The verb phrase”. Thus, the tone group does not consist simply of one main building-block, assembled with the rest of the group on the basis of general phonological rules: the tone assignment process refers to its internal morphosyntactic structure.

Tonal computation takes place independently for successive tone groups. The division of the utterance into tone groups is a central part of Na prosody; several options are generally open, and the choice among them has important implications in terms of the utterance’s information structure.

1. **A summary of tone-to-syllable association rules**

This paragraph summarizes the tone-to-syllable association rules of Yongning Na.

The present description is based on the notion of derivation, from an underlying level to a surface-phonological level. For instance, the LM and LH lexical tone categories are underlyingly distinct, but neutralized at the surface-phonological level. In the few places where there is a potential for confusion between underlying phonological level and surface phonological level, double slashes will be used for transcriptions at the //underlying phonological level//, as against simple slashes for the /surface phonological level/. This is visually unattractive, but desperate tones call for desperate measures.

The tone-to-syllable association rules yield the surface-phonological tones of a given tone group, on the basis of its underlying tones.

1.1. A list of tone rules

The tone association rules for each of the tone categories were touched upon in the discussion of lexical tones in Chapter xyz. These rules also hold for the underlying tone of more complex entities, such as compound nouns, or numeral-plus-classifier phrases – an underlying tone obtained through the table-lookup rules presented in the previous chapters.

Unless otherwise specified, the tone associates to the tonal nucleus syllable by syllable ('left-to-right'), one tone level after another. When there are fewer syllables than tone levels, two levels associate to the last syllable.

Thus, L tone and M tone associate to the first syllable of the tonal nucleus; for LM tone, the first syllable receives L, and the second receives M; for LH, the first syllable likewise receives L, and the second receives H. These four tonal categories (L, M, LM and LH) are the simplest in terms of tone-to-syllable association. The other tone categories (#H, MH#, H\$, L#, LM+MH#, LM+#H, and H#) all have a specific syllabic anchoring, reflected by the special symbols used in the present transcription: # to indicate anchoring relative to the last syllable of the tonal nucleus, and \$ to indicate anchoring relative to the last syllable of the morphological nucleus.

In the case of the mixed tone categories LM+MH# and LM+#H, their first part (LM) attaches to syllables following the usual rules (the same as for a simple LM tone), and their second part (MH# or #H, respectively) attaches as indicated by the added diacritic. Thus, for tone LM+MH#, the first syllable receives L, the second receives M, and the last receives a MH contour. In the special case where only two syllables are available, the MH contour associates to the second syllable, overriding its M tone. In the case of tone category LM+#H, the first syllable likewise receives a L tone and the second a M tone; the H level associates to the first syllable following the tonal nucleus, if a suitable carrier is available. (These two tone categories never associate to a monosyllable.)

At this point in the tone-to-syllable mapping process, some syllables remain toneless. For instance, the lexical disyllable /da.ji/ 'mule', the compound /po.lo-ŋi.pi/ 'ram's ear', the numeral-plus-classifier /gy-ʂu/ 'nine times', and the object-plus-verb combination /dʒ.mi zi/ 'to grab a fox', all of which have tone L#, are only specified for tone on their last syllable. Tonal nuclei carrying L tone are only specified for tone on their first syllable, e.g. /vɿdze/ 'bird', the compound /kʰɿɿmi-hʈ/ 'dog's hair', the numeral-plus-classifier /soɿ-dze/ 'three pairs', and the object-plus-verb

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combination /li] tɕ^hi/ ‘to sell tea’. These toneless syllables receive tone through the assignment rules set out below.

First, L tone spreads, and toneless syllables receive M tone by default.

Rule 1: L tone spreads progressively (‘left-to-right’) onto syllables that are unspecified for tone.

Rule 2: Syllables that remain unspecified for tone after the application of Rule 1 receive M tone.

The phrasing of Rule 2 makes it explicit that these rules need to be ordered: if Rule 2 applied before Rule 1, there would be no tonally unspecified syllables left for L tone to spread over.

This is the stage where the syllables that remained unspecified for tone receive a tonal specification. Taking up the examples provided in §**Erreur ! Source du renvoi introuvable.**, this yields: /da.ji/ > /da.t̪i/ ‘mule’, /po.lo-ŋi.pi/ > /po.lo-ŋi.t̪pi/ ‘ram’s ear’, /gɣ.-ʂuu/ > /gɣ.t̪-ʂuu/ ‘nine times’, and /d̪ɣ.mi ʒi/ > /d̪ɣ.t̪mi.t̪ ʒi/ ‘to grab a fox’, through application of Rule 2; and /v̪dze/ > /v̪.t̪dze/ ‘bird’, /k^hv̪mi-h̃/ > /k^hv̪.t̪mi-h̃/ ‘dog’s hair’, /so.t̪-dze/ > /so.t̪.t̪-dze/ ‘three pairs’, and /li] tɕ^hi/ > /li] tɕ^h.t̪i/ ‘to sell tea’, through application of Rule 1.

The rules that apply next refer to the boundaries of the tone group: tonal oppositions are neutralized in certain positions within the tone group (Rules 3-6), and a repair rule adds a H tone on the last syllable of the tone group if it only contains L tones.

Rule 3: In tone-group-initial position, H and M are neutralized to M.

Rule 4: A syllable following a H-tone syllable receives L tone.

Rule 5: All syllables following a HL or ML sequence receive L tone.

Rule 6: In tone-group-final position, H and M are neutralized to H if they follow a L tone.

Rule 6 applies to contours (LH or LM on the tone-group-final syllable) as well as to simple H and M tones on the tone-group-final syllable. Rule 6 entails that LH and LM contours are neutralized in tone-group-final position; importantly, the product of their neutralization (labelled as LH at the surface-phonological level) contrasts with MH. Rule 6 also entails that there is no opposition between H and M on a tone-group-final syllable when the tone(s) that precede are L.

Rule 7: If a tone group only contains L tones, a post-lexical H tone is added to its last syllable.

The addition of a post-lexical H tone (through Rule 7) to a syllable that already carried a L tone results in a LH contour on that syllable. It is through application of this rule that L-tone expressions receive a final rising contour when spoken in isolation: using the same examples as above, /vɿdzeɿ/ > /vɿdzeɿɿ/ ‘bird’; /kʰɿɿmi-hʋɿ/ > /kʰɿɿmiɿ-hʋɿɿ/ ‘dog’s hair’; /soɿ-dzeɿ/ > /soɿ-dzeɿɿ/ ‘three pairs’; and /liɿ tɕʰiɿ/ > /liɿ tɕʰiɿɿ/ ‘to sell tea’.

The added tone was originally (2008) analyzed as M, on the analogy of the contour of the ‘pig’ tone category, LM, and under the assumption that the language had no LH contours. This may seem to be a non-issue, since LM and LH are neutralized: in a practical orthography, for instance, choosing one or the other consistently would seem to be equally acceptable. However, the M tone in Na is not phonologically active: it does not spread over other tones, or reassociate to other syllables. The H tone, on the other hand, is active and, therefore, appears more likely than M to be involved in a tone rule such as that which affects all-L tone groups.

In two-tone systems, addition of a final H tone in domains having /L/ tone is common. It is attested in languages as genetically diverse as Tibetan (Sun 1997, 499), Japanese (Haraguchi 1999, 19), the Bantu languages Matengo and Kimatumbi (Odden 2005, 415), and Shixing (Chirkova and Michaud 2009). In a three-tone system, describing the added tone as M is not unlikely to cause some confusion in cross-language comparisons and typological generalizations: counting Yongning Na among languages with addition of postlexical M rather than H would be slightly misleading, since H and M are neutralized in this context (there is no contrast between L..L.LH and L..L.LM) and the tone could just as well be described as H.

These are the reasons why the postlexical tone of Yongning Na is analyzed here as a H tone.

1.2. Some comments about the tone rules

1.2.1. About the ordering of rules

As mentioned above, the rules need to be ordered. If Rule 7, which adds a H tone to all-L sequences, applied before Rule 2, which assigns M tone to toneless syllables, a sequence such as ‘...has not arrived’, made up of the negation, /mə-/ , and the verb /tsʰuɿ/ ‘to arrive’, would have only L tones

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(/mə-ts^huɿ/) when Rule 7 applied, and would receive a final H tone (/...ts^huɿ/). Its realization as /məɫ-ts^huɿ/ illustrates the fact that Rule 7 only applies after all the other rules. Rule 2 also applies before Rule 5, as shown by the sequence /məɫ-ts^huɿ-suɿ/ ‘...has not arrived yet’, made up of the negation, /məɫ-, the verb /ts^huɿ/ ‘to arrive’, and /suɿ/ ‘yet; first’. The levelling-down of the M tone of /suɿ/ is a result of the application of Rule 5, “All syllables following a HL or ML sequence receive L tone”; at the point where it applies, the negation must therefore be supposed to bear a M tone.

Rules 3 (“H and M are neutralized to M in tone-group-initial position”) and 4 (“A syllable following a H-tone syllable receives L tone”) likewise need to be ordered. If Rule 4 applied first, an underlying sequence such as //dzuɿ-biɿ// ‘will eat’ would have its second syllable lowered to L, yielding /dzuɿ-biɿ/, and finally /dzuɿ-biɿ/, by application of Rule 3. The observed surface-phonological pattern is actually /dzuɿ-biɿ/, with M tone on the second syllable, not L tone.

1.2.2. *A discussion of alternative formulations*

In the case of H tone, it may seem more simple to collapse Rules 4 and 5 into one single rule to the effect that “H tone can only be followed by L tones”: by the application of that rule, all syllables following a H-tone syllable would receive L tone. But a further rule would then have to be proposed specifically for the ML sequence: “All syllables following a ML sequence receive L tone”. The choice to adopt the present formulation for Rule 4 (“All syllables following a HL or ML sequence receive L tone”) is based on the intuition that the same mechanism is at play in both cases: H.L and M.L are both stepping-down sequences, from a higher tone level to a lower one; the generalization is that stepping-down sequences can only be followed by L tones.

This could also be phrased as a static constraint: “There can be no trough within a tone group”, or “A tone cannot be surrounded by higher tones within a tone group”. This would rule out sequences such as *MLH, *MLM or *MHL. However, such a static constraint would not provide any information on how the offending sequences are avoided or repaired in Na, whereas Rule 5 is fully explicit on this point: the tones which would result in such sequences are all lowered to L.

Rule 4 precludes ...H.H... sequences, so the H tone can be said to be culminative. In this light, the H tone could also be described as a HL

contour. I once attempted an account of Yongning Na tone in which the underlying phonological entities are steps up and down the three-level tonal score, rather than tones: up one level, from L to M or M to H; or down from H or M to L. Proposals in this vein have been made for Tokyo Japanese, where the fall from H to L can be considered as a unitary tonal accent, rather than a succession of two distinct phonological entities. Under a tonal account, the tonal accents of Japanese dialects have to be represented as a sequence of two tones, rather as one single entity; this is a slight drawback of representations in terms of sequences of level tones. A “dynamic treatment of tone” was also attempted for Igbo: such is the title of Mary Clark’s dissertation (Clark 1976). In the case of Yongning Na, if HL were reinterpreted as a ‘high fall’, ML could be called a ‘low fall’; LM would be a ‘low rise’, and MH a ‘high rise’. However, the existence of contours on a single syllable argues in favour of a tonal analysis of the Yongning Na system; the dynamic treatment, which was abandoned for Igbo, does not appear promising for Yongning Na either. (This is of course not to say that it may not prove useful for other languages.)

Rule 4 above also precludes ...H.M... sequences; this can be described as a neutralization (to H.L) of the contrast between H.M and H.L, or simply as an absence of H.M sequences within a tone group.

Simple examples are provided below, and examples based on transcribed texts in §xyz.

1.3. A simple application: deriving the surface tone pattern of words spoken in isolation

A simple application of the rules consists in deriving the tones of words spoken in isolation from their underlying tone category.

The disyllable /k^hɿ.mi/ ‘dog’ has underlying L tone. By the rule governing tone-to-syllable mapping, this L tone associates to the first syllable, yielding /k^hɿ̩mi/. This tone then spreads onto the second syllable by application of Rule 1: “L tone spreads progressively onto syllables that are unspecified for tone”. This yields /k^hɿ̩mi̩/; note that this is how disyllables with L tone are transcribed in the present system, which is slightly redundant in this respect, using two tone marks. Finally, the post-lexical rule adding a final H to all-L tone groups (Rule 7) applies, yielding the surface-phonological tone sequence /k^hɿ̩mi̩H/.

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The unit within which tonal processes apply is referred to here as a *tone group*. Tone groups are indicated by means of the International Phonetic Alphabet symbol |, as in (xyz), a sentence whose division into tone groups is analyzed in detail in §xyz5.2 below.

(xyz) ə́mɿ́ | lé-tsʰu | tʰi | gómi-t-ŋu | ə́mɿ́ | mə́-tsu-tsu
 (...)
 ə́mɿ́ le- tsʰu tʰi go-mi-
 elder_sibling ACCOMP arrive gap_filler:well younger_sibling
 ŋu ə́mɿ́ mə́ su tsu
 A/TOP elder_sibling NEG to_know REP
 ‘[When] the big brother came back, the younger sister did not recognize him!’ (Sister.49)

Successive tone groups are entirely independent from the point of view of their phonological tones: tones never spread or otherwise influence one another across tone-group boundaries. From a phonetic point of view, successive tone groups are linked through a variety of phonetic factors, such as declination and tonal coarticulation. The fundamental frequency value at the beginning of a tone group (say, for a group-initial Mid-tone) is influenced to some extent by the fundamental frequency value reached at the end of the preceding tone group. But such phenomena do not interact with the (phonological) tonal string of the utterance, and need to be distinguished from the processes whereby the surface-phonological string of a tone group obtains. These intonational phenomena will be discussed separately, in the section about intonation in Na (§xyz of Chapter xyz).

2. A static inventory of tone groups of different syntactic makeup

Tone groups can be of highly different syntactic composition. This section presents a static overview; the next section (§3) presents the stylistic degrees of freedom that result in this great diversity.

A tone group may consist of a single syllable. Monosyllabic nouns and verbs spoken in isolation constitute a tone group on their own. Personal pronouns can associate with other words but often appear on their own; examples are numerous, e.g. Reward.128 /ŋɿ | tso-bi-zo-ji/ ‘I will build [a bridge]’ (Renaming.13). The presentation below focuses on longer tone groups, to bring out their diversity: compound noun and numeral-plus-

classifier phrase, as in (xyz1); noun phrase and affixed verb, as in (xyz2); numeral-plus-classifier phrase and affixed verb, as in (xyz3);

(xyz1) ə́mɪ́t-mvɿ́ nɪ́t-kvɿ́
 ə́mɪ́t mvɿ́ nɪ́t-kvɿ́
 mother daughter 2-CLF.persons
 ‘the mother and the daughter, the two of them’ (Lake4.93)

(xyz2) dzuɿ́-dí mət-dzotɿ́
 dzuɿ́ -dí mət dzotɿ́
 to_eat NMLZ NEG EXISTENTIAL
 ‘there was no food’ (Seeds2.69)

(xyz3) dzotɿ́ | dɯ́t-pɣɿ́ tsoɿ́ ə́t-bɪ́?
 dzotɿ́ dɯ́t-pɣɿ́ tsoɿ́_a ə́- bɪ́
 bridge 1-CLF to_build interrogative IMM.FUT
 ‘will (you) build a bridge?’ (Renaming.10)

(www to be continued, providing other examples)

3. The division of utterances into tone groups

Although there exist some general tendencies in the division of utterances into tone groups, and a few hard-and-fast rules, there are often several possibilities open to the speaker; different divisions into tone groups have different implications in terms of prominence of the various components. Prominence (conveying information structure) and phrasing (reflecting syntactic structure) interact in the division of an utterance into tone groups. There is therefore no one-to-one correspondence between syntactic structure and the division into tone groups.

The present description starts with the simplest case: that of elements which always constitute a tone group on their own.

3.1. Some elements always constitute a tone group on their own

Some words always constitute a tone group on their own. These include the gap-filler /tʰiɿ́/ ‘(and) so, (and) then’; /wɣɿ́/ ‘again’, which in quite a few cases does not have its full lexical meaning and is close to a simple

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gap-filler; the intensifier /d̥wæ˧˥/ ‘very’; and the contrastive topic marker /-no˧˥/. (Three of these happen to appear in succession in Housebuilding.144: / | tʰi˧˥ | -no˧˥ | wɔ˧˥ | /.)

To venture a speculation, it might be the case that /tʰi˧˥/ ‘(and) so, (and) then’ and /wɔ˧˥/ ‘again’ are favoured as gap-fillers because of their properties with respect to tone-group divisions. The gap-filler /tʰi˧˥/ appears in most sentences in the narratives told by consultant F4: more than 1,500 occurrences among 20 narratives. The gap-filler /wɔ˧˥/ appears more than 120 times among the same 20 narratives. These two items may owe part of their conspicuous success as gap-fillers to the phonological fact that they demarcate tone groups clearly. Since they always constitute a tone group on their own, they create a pause in the computation of tone sequences. This is no more than a speculation, however, which is difficult to put to the test.

Likewise, the adverb ‘continuously, ceaselessly’ cannot be integrated with a following verb into a single tone group. The verb is preceded by a tone-group boundary, e.g. /d̥u˧˥-njɔ˧˥ | z̥wɔ˧˥-kv˧˥/, ‘to talk incessantly’, from /d̥u˧˥-njɔ˧˥/ ‘continuously, incessantly’ and /z̥wɔ˧˥/ ‘to say’, as in (xyz).

(xyz) hĩ˧˥mo˧˥ = ɣæ˧˥-ŋu˧˥ | d̥u˧˥-njɔ˧˥ | z̥wɔ˧˥-kv˧˥ | mæ˧˥
 hĩ˧˥mo˧˥ = ɣæ˧˥-ŋu˧˥ d̥u˧˥-njɔ˧˥ z̥wɔ˧˥_a kv˧˥ mæ˧˥
 elders = pl-a constantly to_{say} abilitive affirm
 ‘The elders would always say...’ (Dog2.32)

Even when the verb has no suffixes, it is not possible to combine the adverb and verb into a single tone group: /*d̥u˧˥-njɔ˧˥ z̥wɔ˧˥/.

3.2. A tone group boundary is always found after topicalized phrases

A tone group boundary is always found after topicalized phrases. In detail, the situation is as follows:

- the topic-marker /-dzo˧˥/ always terminates a tone group. No exception has been found to date, among some 2,000 examples from narratives.
- the topic-marker /-tʂʰu˧˥/ likewise terminates a tone group, except in the many cases where it is followed by the topic-marker /-dzo˧˥/.
- the topic-marker /-no˧˥/ always constitutes a tone group on its own, as mentioned above and illustrated by (xyz).

(xyz) hwɣ-liɿ | -noɿ, | zy-k^hvɿ-ŋwɣk^hvɿ. |
 hwɣ-liɿ -noɿ zy-k^hvɿ ŋwɣk^hvɿ
 cat TOP four-years five-years

‘As for the cat, [it has a lifespan of] four, five years.’ (Dog2.84; context: the previous discussion hinges on the dog’s lifespan, and the speaker now moves on to the topic of cats.)

3.3. Options left to the speaker in the division into tone groups

Apart from the cases presented above, where the speaker has no choice as to the division into tone groups, the speaker generally has several options. They may choose to integrate large chunks of speech into a single tone group; or they may divide the utterance into a number of tone groups, with the stylistic effect of emphasizing these individual components one after the other. This parallels observations about the intonation of Russian and German by Karcevskij (1931, 204): “Dans certaines limites, nous pouvons déplacer les anti-cadences séparant les membres de la phrase. / Within certain limits, it is possible to change the position of the rhythmic breaks that separate a sentence into parts”. An interesting characteristic of Yongning Na is that this division exerts a direct influence on tonal morphology, since tonal processes never apply across tone-group junctures.

For instance, /dzuɿ-diɿ/ ‘things to eat; food’, from /dzuɿ/ ‘to eat’ and the nominalizer /-di/, can combine with /məɿ-dzoɿ/ ‘there isn’t’ to mean ‘there isn’t any food, there is nothing to eat’; the noun and the negated verb can either be integrated into a single tone group, as /dzuɿ-diɿ məɿ-dzoɿ/, or separated, as /dzuɿ-diɿ | məɿ-dzoɿ/. The latter option is illustrated by (xyz6):

(xyz6) dzuɿ-diɿ | məɿ-dzoɿ, | t^huɿ-diɿ | məɿ-dzoɿ
 dzuɿ -di mə dzoɿ t^huɿ_b -di mə dzoɿ
 to_eat NMLZ NEG EXIST to_drink NMLZ NEG EXIST

‘[Before mankind had learnt to grow crops], there was nothing to eat and nothing to drink!’ (Seeds2.67)

The noun phrase /dzuɿ-diɿ/ ‘food’ and the negated existential verb /məɿ-dzoɿ/ ‘there isn’t’ can be separated into two tone groups, as in (xyz6). This has the effect of emphasizing the two noun phrases, /dzuɿ-diɿ/ ‘food; things to eat’ and /t^huɿ-diɿ/ ‘drink; beverage’. This could be analyzed as a

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case of focalization, and transcribed as /dzuɹ-dɪɿ F | mət-dzoɹ, | tʰuɹ-dɪɿ F | mət-dzoɹ/, where the symbol ‘F’ indicates intonational focalization. The presence of a tone-group boundary before the negation could then be interpreted as a consequence of focalization.

The following sentence in the story repeats the statement ‘There was no food’, continuing the same strategy of bringing out the noun phrase ‘food’, this time with the topic marker /-dzoɹ/: /dzuɹ-dɪɿ | -dzoɹ, | mət-dzoɹ-nɪɿ-tsuɹ | -mɿɿ/ ‘As for food, it’s said that there was none!’ (Seeds2.68). Then the narrator recapitulates, and moves on:

(7) dzuɹ-dɪɿ mət-dzoɹɿ | -dzoɹ | tʰɪɿɿ...
 dzuɹɿ -dɪ mət dzoɹɿ -dzoɹ tʰɪɿɿ
 to_eat NMLZ NEG EXIST TOP so/then

‘As there was nothing to eat, ...’ (the narrative moves on to: ‘there were some exceptional, smart people, who stood up and did something about it’) (Seeds2.69)

At this juncture, ‘there was no food’ is integrated into a single tone group, and followed by the topic marker /-dzoɹ/. This provides an exemplary illustration of the integration of larger chunks of information into a single tone group as this information changes its status from new to old and backgrounded.

Long tone groups within which morphosyntactic tone rules are allowed full play, undisturbed by local intrusions of pragmatic phenomena of emphasis, yield a stylistic effect of carefully constructed, poised, stately speech. The more tightly constructed an utterance, the fewer tone groups it contains. Conversely, in lively speech, tone-group boundaries are inserted, highlighting the word or phrase that precedes. Even function words can be emphasized in this way. Consider (xyzTSU):

(xyzTSU) ɬoɿpyɿ-tɪɿ-kyɿɿ | -tsuɹɿɿ | -mɿɿ!
 ɬoɿpyɿ tɪɿ kyɿɿ -tsuɹɿɿ -mɿɿ
 kow-tow to_hit abilitive rep affirm
 ‘It is said that [on that occasion, the whole family] will kow-tow!’
 (Sister3.138)

A simpler formulation would be /ɬoɿpyɿ-tɪɿ-kyɿɿ-tsuɹɿ | -mɿɿ/. The formulation in (xyzTSU) emphasizes the reported-speech particle. This evidential particle is used over and again by the consultant when telling

narratives: it is used whenever the speaker only has indirect knowledge of the situation at issue. But in the context of (xyzTSU), it takes on its full meaning, because the narrator never witnessed the ritual that she describes. The emphasis laid on the evidential particle in the context of this sentence is one of the manifestations of speaker F4's efforts to adhere to truthfulness and precision.

The stylistic choices made by a speaker can be appraised against a background of general tendencies, outlined below.

3.4. Some general tendencies in the division into tone groups

3.4.1. *The role of the morphological complexity of constituents*

The degree of internal complexity of the successive constituents of an utterance is an important parameter in determining its division into tone groups. A verb without prefixes or suffixes is usually just one syllable long, and easily associates with a preceding element – an adverb or a noun. For instance, /k^huɿts^hɿ tɕ^heɿ/ 'to stretch out [one's] leg', from /k^huɿts^hɿɿ/ 'leg' and /tɕ^heɿ/ 'to stretch out', constitutes a single tonal nucleus, whose output tone is determined by the tone rules that apply in subject+verb phrases (see §xyz of Chapter xyz). When an adverb is inserted, it can be integrated into the tone group, e.g. yielding /k^huɿts^hɿ mvɿtɕoɿ tɕ^heɿ/ 'to stretch (one's) leg down' through addition of /mvɿtɕoɿ/ 'downward'. Often, though, the adverb marks the beginning of a new tone group: /k^huɿts^hɿɿ | mvɿtɕoɿ-tɕ^heɿ/ 'to stretch [one's] leg downward' (two tone groups; the word 'leg' therefore surfaces with its lexical tone, MH).

Like directional adverbs, numeral-plus-classifier phrases often mark the beginning of a new group, e.g. /ɕvɿ-ɕvɿɿ | tɕuɿ-p^hæɿɿ/ 'a sheet of paper' (from /ɕvɿ-ɕvɿɿ/ 'paper'), but they can also be integrated into a single tone group with a preceding noun. For instance, 'the mother and her daughter' can be phrased as /əɿmiɿ-mɿɿ | ɿɿ-kɿɿ/, literally 'mother and daughter, the two' (Tiger.11, 51, and Lake4.93, 96-98, 125), from /əɿmiɿ-mɿɿ/ 'mother and daughter' and /ɿɿ-kɿɿ/, '2' plus the classifier for persons. This is a special case: obviously not an instance of counting over mother-and-daughter pairs. The numeral-plus-classifier phrase does not serve the usual purpose of counting over the referent of the preceding noun: in this context, it serves an anaphoric function (paraphrase: 'these two: the mother and the daughter'). No example was found of pairs of phrases in which the

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same noun plus numeral-plus-classifier combinations yield one tone group vs. two.

Demonstrative-plus-classifier phrases are commonly integrated with a preceding noun: for instance, in the first version of the Lake story, the same two characters, a mother and her daughter, are referred to as /ə́lmiɫ t͡ʂʰuɫ-ɣɫ-lɑɫ | mɣɫ t͡ʂʰuɫ-ɣɫɫ/, ‘that mother and that daughter’.

ə́lmiɫ t͡ʂʰuɫ-ɣɫ-lɑɫ | mɣɫ t͡ʂʰuɫ-ɣɫɫ
 ə́lmiɫ t͡ʂʰuɫ-ɣɫ -lɑɫ mɣɫɫ t͡ʂʰuɫ-ɣɫ
 mother DEM-CLF.individual and daughter DEM-CLF
 ‘that mother and that daughter’ (Lake.52).

This topic is taken up in Chapter xyz, in the discussion of classifiers.

3.4.2. *The role of information structure: considerations of prominence*

Information structure also influences the division into tone groups, in a way which is often difficult to disentangle from the influence of morphological complexity. Consider (xyz):

(xyz) kʰvɫmiɫ-ʂeɫɫ, | dzuɫ-məɫ-dɔɫ-piɫ-zoɫ!
 kʰvɫmiɫ-ʂeɫ dzuɫ məɫ dɔɫ piɫ zo
 dog-meat to_eat NEG ought_to to_say ADVB
 ‘It’s said that one mustn’t eat dog meat! / It’s said that dog meat is something one must not eat!’ (Dog2.37)

In (xyz), the noun phrase ‘dog meat’ is set into relief by constituting a tone group on its own. Despite the absence of a morphemic indication that it is topicalized – such as use of the morpheme /-t͡ʂʰuɫ/ or /-dzoɫ/ – it clearly has the status of topic. In this context, tonal integration with a following verb would not be stylistically appropriate.

Likewise, in (xyz), the adverbial ‘outside’, /ə́ɭpʰoɫ/, constitutes a tone group on its own; another option would be to integrate it tonally with the following verb. (The tone rules in spatial adverbial+verb combinations are set out in §xyz of ChapterxyzP_TheVerbPhrase.) In this context, integration into a single tone group would be stylistically acceptable; it would reflect a higher degree of linguistic elaboration. Separation into two tone groups has the effect of providing the information gradually, giving

the impression that the speaker is constructing the utterance as she is saying it, rather than delivering long, carefully preplanned chunks of speech.

(xyz) əʃji-t-ʃuʃji-dzoʃ, | kʰv-t-ʃʰuʃ-dzoʃ, | dzɤʃ | əʃpʰoʃ | kʰuʃ-məʃ-kvʃ!

əʃji-t-ʃuʃji	dzoʃ	kʰv	-ʃʰuʃ	-dzoʃ	dzɤʃ	əʃpʰoʃ
in_the_past	top	dog	top	top	intensifier	outside
kʰuʃ	məʃ	kvʃ				
to_let	neg	abilitive				

‘In the old times, one wouldn’t usually let dogs go outside! / In the old times, dogs weren’t usually allowed to leave the house!’ (Dog2.75)

It is uncommon for a verb preceded by the accomplished /le-t-/ to interact tonally with a preceding noun phrase. In Caravans.191, for instance, ‘the uncle comes back’ is realized as /əʃvʃ | le-t-ʃʰuʃ/, not as /əʃvʃ le-t-ʃʰuʃ/, although the latter form is also acceptable. Cases where tonal interaction does take place are characterized by a strong degree of semantic givenness, as in (xyz):

(xyz) ɖuʃ-vʃ | le-t-ʃʰuʃ, | niʃ-kvʃ | le-t-ʃʰuʃ, | soʃ-kvʃ | le-t-ʃʰuʃ

ɖuʃ-vʃ	le-t-	ʃʰuʃ	niʃ-kvʃ	soʃ-kvʃ
1-CLF.individual	ACCOMP	to_arrive	2-CLF	3-CLF

‘There arrived one person, then two, then three’ (field notes: explanation proposed by consultant F4 during a discussion of Lake4.126)

It would not be incorrect to say /ɖuʃ-vʃ | le-t-ʃʰuʃ, | niʃ-kvʃ | le-t-ʃʰuʃ, | soʃ-kvʃ | le-t-ʃʰuʃ/, but this would be inappropriate in a context where the emphasis is on the incrementation of the figure: one person, then two, then three. There would be no point in setting the subject apart from the verb, hence the division into three tone groups, rather than six.

When an explanation is added as an afterthought, a relatively long sequence of syllables can be integrated into a single tone group, as in (xyz), where the last tone group contains ten syllables.

(xyz) ʃɤʃ-t-dzoʃ, | əʃji-t-ʃuʃji, | hǣʃ-baʃlaʃ! | hǣʃ-baʃlaʃ-baʃlaʃ | leʃ-poʃ-joʃ-kvʃ-mǣʃ!

ʃɤʃ-t	dzoʃ	əʃji-t-ʃuʃji	hǣʃ-baʃlaʃ	hǣʃ-baʃlaʃ-baʃlaʃ
Chengdu	top	in_the_past	silk	silk_clothes

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leɬ- poɬɿ joɿ kyɿɿ mæɿ
 accomp to_bringto_come abilitive affirm
 ‘From Chengdu, in the past... Silk!! [The people who went on caravans]
 would bring back silk [from their journeys to Chengdu]!’ (Caravans104-
 105)

In a context where the narrator is explaining which goods used to be transported by caravan, the essential information is already given in the word ‘silk’. The portion of sentence /...leɿ-poɿ-joɿ-kyɿ-mæɿ/ ‘[they] would bring back’ is added as an explanation; its integration with the preceding noun, ‘silk’, into a single tone group, results in a levelling down of all of its tones to L, reflecting its status as backgrounded information.

In Elders3.11, as many as twelve syllables are bunched together: /əɿziɿɿ, | dʊɿmaɿɿ-tɿtsʰoɿ piɿ-hɿɿ dʊɿɿ-ɿ dzoɿ-niɿ-tsuɿ-mɿɿ/ ‘[Among] women elders, it is said that there was one by the name of dʊɿmaɿɿ-tɿtsʰoɿ.’ The speaker lays considerable emphasis on the person’s name, /dʊɿmaɿɿ-tɿtsʰoɿ/; all the rest of the sentence follows as a strongly backgrounded accompaniment to this name. Phonologically, the name and all that follows are integrated into a single tone group, with the result that all the syllables from the third to the twelfth and last are lowered to L.

As a last example, in Renaming.17, the same syntactic structure, ‘you came along’, is realized as two tone groups: /noɿ | leɿ-tsʰuɿ-niɿ-zeɿ-mæɿ/, then repeated as a single tone group: /noɿ leɿ-tsʰuɿ-niɿ-zeɿ-mæɿ/, providing a striking illustration of how sentences tend to be integrated into broader chunk when the speaker assumes that the semantic content is already familiar to the listener.

3.5. Extreme cases of tonal integration: set phrases and proverbs

3.5.1. *Tonal integration in set phrases*

Set phrases constitute an extreme case of integration. For instance, there exist formulae that recapitulate which of the animals symbolizing the twelve Terrestrial Branches have special affinities with one another. This is one of the bases for fortune-telling: the year of birth is used as a basis from which to predict whether or not an individual will be able to relate harmoniously with another, in marriage or various other important circumstances. Among the animals that succeed one another in the twelve-

year cycle, there are four sets of three, indicated below in surface-phonological notation:

- /bvɿzvɿ | jiɿ | æɿ/ are grouped as /bvɿzvɿ, jiɿ, | æɿ-soɿ-kʰvɿ/ ‘the three years of the Serpent, the Ox, and the Rooster’;
- /mvɿgvɿ | ziɿ | hwɿɿ/ are grouped as /mvɿgvɿ ziɿ | hwɿɿ-soɿ-kʰvɿ/ ‘the three years of the Dragon, the Ape, and the Rat’;
- /tʰoɿliɿ | boɿ | joɿ/ are grouped as /tʰoɿliɿ-boɿ | joɿ-soɿkʰvɿɿ/ ‘the three years of the Rabbit, the Pig, and the Sheep’;
- /laɿ | zɰwæɿ | kʰvɿ/ are grouped as /laɿ, | zɰwæɿ, | kʰvɿ | soɿ-kʰvɿɿ/ ‘the three years of the Tiger, the Horse, and the Dog’.

The tone grouping is not exactly the same in all of these four phrases. In the first three cases, the first two animal names are integrated into one tone group, and the third is integrated together with the phrase ‘three years’. Each of these three set phrases only comprises two tone groups, half the number than if each animal name were said separately. In the fourth phrase, however, the three animal names do remain separate, each constituting a distinct tone group, hence yielding four tone groups in total.

3.5.2. *Tonal integration in proverbs*

Proverbs are also typical instances of tightly-knit tonal integration. An example is shown in (xyz).

(xyz) hĩɿdzaɿ | dʒeɿ tʰaɿ-jiɿ, | ʃĩkoɿ miɿ tʰaɿ-tʰvɿ
 hĩɿ dzaɿ dʒeɿ tʰaɿ- jiɿ ʃĩkoɿ miɿ tʰaɿ- tʰvɿ
 person poor money PROHIB to_borrow shinbone wound PROHIB to_get
 ‘The poor must not borrow money; the shinbone must not receive wounds.’

The proverb’s argument is that one must beware of hitting fragile spots. The listener is presumed to know that a blow to the shin is especially painful; and to imagine, by analogy, how hard it is for a poor person to reimburse a loan plus added interest. The sequence /ʃĩkoɿ miɿ tʰaɿ-tʰvɿ/, ‘the shinbone must not receive wounds’, is integrated into a single tone group, with the stylistic effect of presenting it as a self-evident fact (an established truth), not a statement coined on the fly by the speaker, in which case the tone pattern would have been /ʃĩkoɿ | miɿ | tʰaɿ-tʰvɿ/.

It is highly revealing that, even in the case of proverbs and set phrases, the speaker retains a latitude of choice in the division of the utterance into tone groups. The comparison of different versions of the same story by the

same speaker yields a wealth of examples. For instance, the saying /la- do- ɤda- ʃu-/, | zæ- do- ɤmi- ʃu-| ‘If you see the tiger, it means your father is going to die; if you see the panther, it means your mother is going to die’, which is at the heart of the narrative *Tiger*, is divided into two tone groups. However, a realization as four tone groups is found in four of the eight occurrences: /zæ- do-/, | ɤ-mi- ʃu-|; | la- do-/, | ɤ-da- ʃu-|. An intermediate case, with a division into three tone groups, is also attested: /zæ- do- | ɤ-mi- ʃu-/, | la- do- ɤda- ʃu-| (*Tiger*.50). As in the examples described above, the stylistic nuance is that, the greater the number of tone groups, the more attention is drawn to the individual components of the sentence.

As a final example, let us examine the saying ‘What remains unseen by humans is nonetheless seen by the heavens!’, used as a reminder that other people’s gaze is not the touchstone of good conduct, and that one’s actions should be guided by the same rules whether seen or unseen. The most common realization of this saying is: /hĩ-ŋu- mɔ- do-/, | mv-ŋu- | do-|/, where the first part (‘What people do not see’) is integrated into a single tone group, whereas the second is divided into two. This emphatically brings out the verb /do-| ‘to see, to observe’, which being on its own in the tone group receives a final H tone and is realized on a rising pitch, LH, following Rule 7: “If a tone group only contains L tones, a post-lexical H tone is added to its last syllable”. (Variants are found in the narrative *Reward*.28, 36, 62, 114.)

3.6. A case of resistance to tonal integration

This paragraph discusses the case of compounds that resist the tendency towards integration into a single tone group. The most frequently occurring example is ‘Lugu Lake’, /lo-ʃv- | -hi-ŋa-mi-#|/, literally ‘the lake of lo-ʃv-|’, from /hi-ŋa-mi-#| ‘lake’ and /lo-ʃv-| ‘Luòshuǐ 落水’, the name of a village on the shore of Lugu lake. As mentioned at the outset of Chapter xyz01, the noun phrase /lo-ʃv- | -hi-ŋa-mi-#|/ must be analyzed as consisting of two tone groups; if it constituted a single tone group, its tone pattern would be /*lo-ʃv-|hi-ŋa-mi-|/, by application of Rule 5: “All syllables following a HL or ML sequence receive L tone”.

Likewise, the word /sa- | zo-ŋb-ŋ|u-/, meaning ‘the universe, the whole world’ (*Mountains*.69), resist the tendency towards tonal integration. This word is perceived as composed of two parts, /sa-| and /zo-ŋb-ŋ|u-/, even though the first syllable, /sa-/, is no longer intelligible by itself, and cannot be used on its own. The trisyllable /zo-ŋb-ŋ|u-/, though, can be employed

on its own, to mean ‘the universe’, like the four-syllable word; the existence of this trisyllabic form may partially explain why the four-syllable word /saɪ | zoɪbyɪ|u/ ‘the universe’ does not get integrated into a single tone group. If such integration took place, this would yield a M.L.L.L tone pattern, /*saɪ-zoɪbyɪ|u/, again by application of Rule 5: “All syllables following a HL or ML sequence receive L tone”.

A third example is ‘field penny-cress’, a foetid plant with round flat pods (*Thlaspi arvense*). It is called /ɛvɪ-bvɪ | vɪtsʰɛɪ/ in Na, literally ‘the crane’s vegetable’. The fact that the name can still be transparently analyzed as a possessive construction probably contributes to slowing down its phonological integration into a single tone group.

3.7. Sample derivation

This section recapitulates the mechanisms presented above by giving examples.

3.7.1. Noun+clitic+suffix+copula+particles

My main consultant’s family name, spoken in isolation, is [laɪtʰaɪmi]. Its phonological form is /laɪtʰaɪmiɪ/, i.e. it has a morphological-nucleus-final H tone (tone category H\$).

When the COLLECTIVE clitic /=ɪ/ is added to it, it yields /laɪtʰaɪmiɪ=ɪ/ ‘the Latami family; the Latamis’. As mentioned above, clitics belong to the tonal nucleus, along with the noun to which they are attached.

Addition of the AGT/TOP suffix /ɲu/ yields /laɪtʰaɪmiɪ=ɪ-ɲu/ ‘by the Latami family’. The suffix is not part of the tonal nucleus, but it belongs in the morphological nucleus, and the H tone therefore moves all the way to this syllable.

As for the copula, //ɲi//, it belongs in the same tonal nucleus as a preceding noun, hence /laɪtʰaɪmiɪ=ɪɲi/ ‘it is the Latami family’.

Finally, sentence particles belong neither in the tonal nucleus nor in the morphological nucleus, hence /laɪtʰaɪmiɪ=ɪɲi-ɬsuɪ-mɪ/ ‘it is said that this is the Latami family’ (/ɬsuɪɪ/: particle of reported speech; /-mɪ/: affirmative particle) and /laɪtʰaɪmiɪ=ɪɲi-dzo/ ‘as for the Latami family...’ (/dzoɪ/: topic marker). Importantly, even though the surface tones on /ɬsuɪ-mɪ/ and /-dzo/ do not carry H, this is still only one tone group.

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3.7.2. *Movement and unfolding of the MH tone*

(xyz) æɭkɥɿ | gɣɿ-p^{hi}ɿ leɿ-ts^huɿ-tsuɿ
 æɭkɥɿ | gɣɿ- p^{hi}ɿ | leɿ- ts^huɿ | tsuɿ |
 egg upward to_spit ACCOMP to_come REP
 ‘It is said that [she] spat out the egg!’ (BuriedAlive2.143)

The derivation of the tone group /gɣɿ-p^{hi}ɿ leɿ-ts^huɿ-tsuɿ/ can be presented as follows:

- (i) Lexical tones: /gɣɿ- p^{hi}ɿ | leɿ- ts^huɿ | -tsuɿ |
- (ii) First level of grouping: /{gɣɿ-p^{hi}ɿ} {leɿ-ts^huɿ} -tsuɿ |
- (iii) Left-to-right computation: the MH pattern of /p^{hi}ɿ | spreads rightwards, up to the syllable /ts^huɿ/: /{gɣɿ-p^{hi}ɿ leɿ-ts^huɿ} -tsuɿ |
- (iv) Unfolding of the MH contour, overriding (replacing) the lexical tone of the final particle: /gɣɿ-p^{hi}ɿ leɿ-ts^huɿ-tsuɿ |

3.7.3. *An entire sentence: Sister.49*

(xyzPL) əɭmɥɿ | leɿ-ts^huɿ | t^{hi}ɿ | goɭmiɿ-ŋuɿ | əɭmɥɿ |
 məɿ-suɿ-tsuɿ-mɥɿ |
 əɭmɥɿ | leɿ- ts^huɿ | t^{hi}ɿ | goɭmiɿ
 elder_sibling ACCOMP arrive gap_filler:well younger_sibling
 ŋuɿ əɭmɥɿ məɿ suɿ tsuɿ mɥɿ
 A/TOP elder_sibling NEG to_know REP affirm
 ‘[When] the big brother came back, the younger sister didn’t recognize him!’ (Sister.49)

In this example, the group |əɭmɥɿ | ‘elder sibling’ consists of a single noun; the levels of the tonal nucleus, morphological nucleus and tone group coincide. In the absence of suffixes or final particles, its lexical tone, MH, is realized on the last syllable of the tonal nucleus, which is also the last syllable of the tone group.

In the group |əɭmɥɿ-ŋuɿ | ‘by the elder sibling’, the tonal nucleus coincides with the noun, as in example (xyzPL). But in this case, the morphological nucleus is distinct from the tonal nucleus, since there is a suffix, /ŋuɿ/ (AGT/TOP). Indicating the boundary between the tonal nucleus and its suffix, this group would be transcribed as |əɭmɥɿ-#-ŋuɿ |. The

rising contour (MH) of /ə-ɪmɪ-ɪ/ ‘elder sibling’ projects its H part onto the suffix, as was also illustrated by example (xyzPL).

The word /tʰiɪɪ/ ‘(and) then, (and) so’ constitutes a tone group on its own: about this gap-filler, see §xyz.

The group | mət-suɪ-tsuɪ-mɪ | ‘...didn’t know/recognize’ contains the verb ‘to know’, /suɪ/, which constitutes the tonal nucleus. It is flanked by the negative prefix /mə-/ and the sentence particles /-tsuɪ-ɪ/ (reported speech) and /-mɪ/ (affirmative). Indicating boundaries explicitly, this group would be transcribed as | mət-suɪ\$-tsuɪ-mɪ | (or, adding the symbol marking the end of the tonal nucleus: | mət-suɪ#-\$-tsuɪ-mɪ |). In keeping with the rules summarized below (§xyz), the negative prefix /mə-/ receives M tone by default, and the sentence particles receive L due to the fact that they are preceded by a H tone (rules 3 and 4).

4. Cases of breach of tonal grouping, and consequences for the system

This section describes how non-final syllables can come to carry a contour, in which case the following syllables tend to become extrametrical.

4.1. The stylistic option of realizing a contour on a word in non-final position

Syllables that are not in final position within the tone group do not carry a contour (MH, LM or LH, the latter two being neutralized to LH at the surface-phonological level). This is an important part of the definition of the phonological unit of tone group. But this rule is at odds with a stylistic device whereby a word is emphasized by cutting short the tone group immediately after it. This device suspends tonal calculation, and allows the realization of a contour on the emphasized word, as in (xyzAA).

(xyzAA) leɪ-tsaɪɪ, | leɪ-tsaɪɪ, | leɪ-tsaɪɪ | -kwɔɪ-tɕuɪ, | leɪ-lɪɪɪ!
 leɪ- tsaɪɪ -kwɔɪ-tɕuɪ leɪ- lɪɪɪ
 ACCOMP to_row when/because ACCOMP to_escape
 ‘By rowing, rowing, rowing, they escaped/they managed to escape!’
 (Lake3.59)

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The context to this example is highly emotional: a mother and her daughter are rowing for their lives, struggling against the flood that has come over the plain where they lived, now suddenly become a lake. The verb ‘to row’ is repeated, and the sentence chopped into short tone groups. The verb is strongly articulated, each time with its lexical rising tone; the conjunction /-kwɿ-tɕu/ is tacked on as if it were an afterthought. (The hyphen after the tone group boundary (/...l -kwɿ-tɕu/)) serves as an indication that the syllables at issue are extrametrical, and do not constitute a full-fledged tone group on their own.) It would be possible to say /le-tsa-t-kwɿ-tɕu/ for ‘...because [they] rowed...’, with the expected unfolding of the MH contour over the verb and the first syllable of the conjunction, but this deliberate, neatly structured variant would be stylistically inappropriate in this context.

An example using the same conjunction as above, but where the expected division into tone groups is respected, and where the expected process of unfolding of a contour tone takes place, is found in BuriedAlive2.48:

(xyzE) loɰdzoɰ | tɕ^hu-tɰi-tɰ | mɿɰtɕo-t p^hɿ-t-kwɿ-tɕu-tɰuɰ, | "q^{hhhh}...
 ə!" pi-tɕuɰ-mɿɰ. |
 loɰdzoɰ tɕ^hu-tɰi-tɰ mɿɰtɕo-t p^hɿ-t -kwɿ-tɕu -tɰu
 bracelet thus downward take_off when top
 q^{hhhh}...ə! piɰ tɕu-tɰ mɿ
 onomatopoeia:burp! to_say rep affirm
 ‘When [the man] took off [the buried woman’s bracelets], like this, [the
 corpse made a gurgling sound]: Buuurp!’

This is the only example found so far where the H part of a verb’s MH contour reassociates to the conjunction // -kwɿ-tɕu //, as against 14 examples where this contour surfaces as such on the verb prior to this conjunction (Dog.49, Tiger.46, BuriedAlive3.65, Caravans.80, Sister.50, Sister3.133, Seeds2.34, Renaming.18, 41, Funeral.51...). Example (16) is just enough evidence to show that a realization with contour spreading is possible. Contour unfolding might once have been the norm, and the realization with a contour on the verb might have originally been a conspicuous stylistic effect; but the latter is now much more common than the former, to the point that the realization with contour unfolding is now a stylistically marked option.

Realizations of a contour in non-final position are common; examples include Tiger.51 and Housebuilding.71, 98, 100.

Another construction for which the set of narratives contains examples without the unfolding of a rising contour is the combination of /t͡ɕʰu˧˥ne˧˥/ ‘thus, in this way’ and /gɤ˧˥/ ‘to take place, to occur (event)’.

(xyz) ə˧˥tsə˧˥ mə˧˥-ni˧˥ | zɤ˧˥-kv˧˥! | ə˧˥mi˧˥! | ə˧˥ji˧˥-ʂu˧˥ji˧˥-dzo˧˥, | “t͡ɕʰu˧˥-zi˧˥ | -dzo˧˥, | t͡ɕʰu˧˥ne˧˥ gɤ˧˥ | -ni˧˥! | tʰv˧˥-zi˧˥ | -dzo˧˥, | t͡ɕʰu˧˥ne˧˥ gɤ˧˥ | -ni˧˥! | hɪ˧˥-dzo˧˥, | dʒɤ˧˥-hɪ˧˥ so˧˥-zo˧˥-kv˧˥! | dʒa˧˥-hɪ˧˥, | ji˧˥-mə˧˥-qə˧˥! |”

‘[My grandmother] knew about everything (literally: ‘could speak about everything’)! Good lord! In the old times, [she would also tell us stories about people in the village, and what we must learn from them:] “This household, this is what happened to them! That household, this is what happened to them! (literally: ‘this is how it happened’) One must develop habits of doing good! One mustn’t do wrong! (literally: ‘bad things mustn’t be done’)” ’ (Elders3.44-45)

There are two instance in this example where ending the tone group after the phrase /t͡ɕʰu˧˥ne˧˥ gɤ˧˥/ sets this phrase apart as making up a block. The following morpheme, /-ni˧˥/ (the copula, in a bleached use in which it serves to emphasize assertion), also stands out by not being incorporated within the same tone group. Use of the bleached copula here is clearly that of “an epistemic strategy that marks a high degree of certitude” (Lidz 2010:497). In context, it reflects the assertiveness of the character (the grandmother) to whom this passage in reported speech is assigned. Realization as /t͡ɕʰu˧˥ne˧˥ gɤ˧˥ | -ni˧˥/ rather than /t͡ɕʰu˧˥ne˧˥ gɤ˧˥-ni˧˥/ reflects the deliberate, authoritative way in which the character spoke.

On the other hand, when the phrase ‘This is how it happened’ is told more casually, as an introduction to a narrative, it constitutes one single tone group, as /t͡ɕʰu˧˥ne˧˥ gɤ˧˥-ni˧˥-tsu˧˥-mv˧˥/ (with following REPORTED-SPEECH particle /tsu˧˥/ and AFFIRMATIVE /mɤ˧˥/). A related phrasing is /t͡ɕʰu˧˥ne˧˥ gɤ˧˥-kɤ˧˥/, ‘This is how it would happen’ (as in Sister3.149), which is similarly a set phrase and hence integrated into a single tone group (also with following particles such as /-tsu˧˥-mɤ˧˥/, as in Tiger.2).

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4.2. Consequences for the tone system: the emergence of extrametrical syllables

The phenomenon whereby a tone group is cut short after a certain word (noun or verb) has some consequences for the general architecture of the tone system. In cases where the portion of tone group that is cut off from the verb can stand on its own as a tone group, the tenets of the system remain unaffected, such as in example (xyz).

(xyzF) hæɬ, | k^hvɬmiɬ-ʂeɬ | dzuɬ-kvɬ!
 hæɬ k^hvɬmiɬ-ʂeɬ dzuɬ kvɬɬ
 Chinese dog_meat to_eat abilitive
 ‘The Chinese (Han) eat dog meat!’ (Field notes, 2012)

Example (xyzF) lays emphasis on ‘dog meat’: in the Na world view, dogs and men are close friends – the dog agreed to exchange its 60-year lifespan with the 13-year lifespan that had initially been granted to man (see the narrative “Dog”). Eating dog meat is therefore taboo among the Na, and the fact that some other ethnic groups do eat dog meat comes to them as a shock. An unmarked phrasing of (xyzF) would be /hæɬ | k^hvɬmiɬ-ʂeɬ dzuɬ-kvɬ/, in which a single tone group spans the object and verb, and tonal computation takes place.

Example (xyz) shows that this phenomenon can take place as early as the first syllable of a sentence.

(xyz) p^hoɬ | huɬ-kwɔɬ-tɕuɬ-laɬ | t^hiɬ, | goɬmiɬ t^ʂhɔɬ-vɬ-dzoɬ, |
 leɬ-ŋvɬ, | leɬ-ŋvɬ, | leɬ-ŋvɬ, | leɬ-ŋvɬ, | leɬ-ŋvɬ-zoɬ!
 p^hoɬ_a huɬ_c -kwɔɬ-tɕuɬ-laɬ t^hiɬɬ
 to_flee/to_rush to_go.PST after then
 goɬmiɬ t^ʂhɔɬ vɬ -dzoɬ leɬ- ŋvɬ -zo
 younger_sister DEM.PROX CLF TOP ACCOMP to_cry ADVB
 ‘After he rushed away, [his] younger daughter cried her eyes out!’
 (Sister3.68)

A more strongly integrated formulation would be: /p^hoɬ-huɬ-kwɔɬ-tɕuɬ-laɬ/, without any special emphasis on the verb.

On the other hand, when particles or conjunctions are left stranded, as in (xyzAA), they do not constitute a tone group on their own. The rules recapitulated in §1, such as the addition of a final H tone to all-L sequences,

do not apply to them – otherwise one would expect a final rising contour: /*lel-tsuɿ | -kwɿ-tɕuɿ/. Nor are these stranded syllables integrated into the following tone group.

Several options for modelling are open here. One option would be to consider that, at some phonological level, the division into tone groups is in fact left unchanged. This would entail that a contour can be realized in non-final position within a tone group, an option which seems to run into insuperable difficulties. A preferred option is to consider that the emphasis laid on a word, and the consequent realization of a contour on that word, modifies the utterance's division into tone groups, and that the syllables left stranded acquire extrametrical status. The notion of extrametricality supersedes the general rule which serves as one of the key criteria for the definition of the tone group as a phonological unit, i.e. that contours only appear tone-group-finally. There exists additional evidence for resorting to the concept of extrametricality in the description of the Na tone system: this concept also applies to the affirmative particle //mvɿ/. This particle cannot host a H level from a preceding reported-speech particle //tsuɿ/: the sequence is realized as /-tsuɿ-mvɿ/, not /*-tsuɿ-mvɿ/.

At this point, it is useful to examine a further example.

(xyzB) pvɿ[uɿ dʒɿɿ -kiɿ-tsuɿ-mvɿ].				
pvɿ[uɿ	dʒɿɿ	kiɿ	tsuɿ	mvɿ
button	to_pluck	to_give	REP	AFFIRM

'It is said that [he] plucked a [button from his jacket] and gave it [to the child]. He plucked one, and gave it [to the child].' (Renaming.23)

Three stylistic options are open here. The most tightly-knit would involve a single tone group: /dʒɿɿ-kiɿ-tsuɿ-mvɿ/. The most analytic would involve two full-fledged tone groups: /dʒɿɿ | kiɿ-tsuɿ | -mvɿ/, with the added complexity that the second tone group contains a contour, MH, on a non-final syllable; this issue will be addressed below, §xyz. The third one, found in the recorded narrative, is intermediate: the verb /dʒɿɿ/ 'to pluck' is realized with its lexical MH contour, as if it were tone-group-final, and the syllables that follow are all lowered to L, as if they belonged to the preceding tone group. In the transcription, the hyphen after the tone group boundary (/... | -kiɿ-tsuɿ-mvɿ/) serves as an indication that the syllables at issue are extrametrical, and do not constitute a full-fledged tone group on their own.

This range of stylistic variation is a salient characteristic of Yongning Na. Among other potential consequences for the evolution of the tone system, extrametrical syllables at the end of a tone group may tend to become affiliated to the following tone group instead, in cases where the sequence of (surface) tones allows for this reinterpretation. A case in point is the highly frequent sequence of the topic-marker /-dzo/ and the discourse marker /^{hi}ɿ/ ‘so, then’. The latter makes up a tone group on its own, as was mentioned in section 3.1. However, in the narratives recorded by consultant F4, it is not preceded by any perceived pause; there tends to be a pause before the topic-marker, and the two syllables /-dzo/ and /^{hi}ɿ/ are then pronounced in quick succession. There is thus a discrepancy between two levels: that of the division into tone groups, on the one hand, and that of linguistic rhythm, on the other. From a phonological point of view the sequence of /-dzo/ and /^{hi}ɿ/ would constitute a well-formed tone group: L.LH is the way a disyllabic tone group with underlying L tone is realized. One may speculate that the high discourse frequency of the (phonetically) tightly-knit /dzoɿ.^{hi}ɿ/ sequence paves the way for its reinterpretation as a single tone group. A typical example is the sequence /giɿ | -dzoɿ | ^{hi}ɿ/ (Mountains.58), ‘really-TOP-so/then’. Here, /giɿ/ is realized with a rising contour, unambiguously signalling the end of a tone group, and leaving the topic-marker stranded (i.e. with extrametrical status). While /dzoɿ/ does not constitute a well-formed tone group, the sequence /dzoɿ ^{hi}ɿ/ would constitute one.

4.3. Further examples of extrametrical elements

The expression /əɿ-giɿ/ ‘isn’t it!’, ‘right!’ is commonly tagged at the end of an utterance. A preceding LH or MH contour does not unfold over it, as would be expected within a tone group (Caravans.257, 287; Housebuilding.113; Mountains.159; Sister3.86). It is often preceded by a short (perceived) pause. These two observations suggest that /əɿ-giɿ/ constitutes a tone group on its own. On the other hand, the fact that the expression /əɿ-giɿ/ contains only L tones implies that it does not constitute a tone group on its own, otherwise it would be realized as /əɿ-giɿ/. The latter, /əɿ-giɿ/, is well-formed and attested in the narratives, but it is a full-fledged question (‘Is it true?’), whereas /əɿ-giɿ/ is more phatic – almost a gap-filler. The expression /əɿ-giɿ/ is here treated as extrametrical; in the transcriptions, it is preceded by a tone group boundary, to reflect the fact that it does not interact tonally with what precedes it.

To summarize the above discussion: the tonal group may be interrupted after the last syllable of a word (verb or noun), leaving some syllables stranded. These syllables are described as having extrametrical status.

5. Concluding remarks

The division of an utterance into tone groups plays a central role in conveying phrasing and prominence. The Na facts appear closely parallel to the well-documented division of sentences into intonational groups in English (or French): a phrase such as ‘the Massachusetts Institute of Technology’ can be realized with the lexical stress of all three words (‘Massachusetts’, ‘Institute’ and ‘Technology’) clearly realized, with a tune of its own; but someone who is familiar with the place is likely to say it as one single intonational group, integrating the three stressed words and two grammatical words into a single fundamental frequency contour. (On French, see, among other descriptions, Vaissière 1975; Di Cristo 1998; Rossi 1999; Vaissière and Michaud 2006; Martin 2009.)

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Chapter 10

From surface-phonological forms to phonetic realization: intonation and tonal implementation

1. Introduction

Tones and intonation are necessarily studied together, since they share an all-important phonetic correlate: voice fundamental frequency (F_0). Na tones are phonetically specified only in terms of pitch: they do not have length or phonation-type characteristics as part of their phonological definition, unlike in Tamang, Vietnamese and other Southeast Asian languages. Phonetically, I believe that without the help of a language consultant it is simply impossible to know for sure, for a given utterance that has, for instance, a lowering of F_0 on its last syllable, whether this is due to a L tone on that syllable or to intonational final lowering of a M-tone syllable. xxx (exemple réel) Intonation has a salient effect on fundamental frequency. Arriving at tonal contrasts requires factoring out intonation.

The following paragraphs presents salient characteristics of Na intonation. But some concepts need to be discussed first.

1.1. Definition of terms

Prosody as defined here consists of (i) nonphonemic lexically distinctive properties: stress, as in English; tone, as in Na, Mandarin or Yorùbá; tonal accent, as in Japanese and Swedish; phonation-type register, as in Mon (Mon-Khmer family); (ii) intonation; and (iii) performance factors, including rhythm.

Intonation, which is often (and perhaps somewhat abusively) identified with the parameters whereby it manifests itself – and especially with fundamental frequency –, is a complex, abstract structure, that can usefully be divided into (i) two sub-systems of structuration: syntactic intonation (phrasing), which essentially reflects syntax in the broader sense, and pragmatic intonation (prominence), which reflects information structure;

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(ii) attitudinal and emotional dimensions, that convey speaker attitudes and emotions.

Intonation is, in Bolinger's phrase, a "half-tamed savage" (Bolinger 1978:475). *Phrasing* is on the tamer, more intellectual side; it surfaces at its clearest in deliberate oral renderings of elaborately composed texts. *Prominence* is a less tame dimension of intonation: it can still be described in terms of a linguistic system, with clear cross-linguistic differences, but the intrusion of the stronger manifestations of prominence can interfere with phrasing as determined by syntactic structure. As for the expression of attitudes and emotions, it can partly be described in terms of ethological principles, such as the "Frequency Code" (Ohala 1983).

These definitions, taken up from a publication about prosodic constituents in French (Vaissière and Michaud 2006), elaborate on earlier proposals (Coustenoble and Armstrong 1937; Delattre 1965; Delattre 1966; Martin 1977) and closely resemble those put forward by Mario Rossi in a book (in French) about the intonation of French (Rossi 1999). Usage still varies considerably between authors (a detailed discussion of various definitions is proposed by Di Cristo 1998).

As defined in this paper, tone has the function of lexical and morphological differentiation, and intonation the functions of speech phrasing, of coding prominence and sentence mode, and of expressing emotions and attitudes towards the listener. Intonation is, in Bolinger's phrase, a "half-tamed savage" (Bolinger 1978:475). *Phrasing* is on the tamer, more intellectual side; it surfaces at its clearest in deliberate oral renderings of elaborately composed texts. *Prominence* is a less tame dimension of intonation: it can still be described in terms of a linguistic system, with clear cross-linguistic differences, but the intrusion of the stronger manifestations of prominence can interfere with phrasing as determined by syntactic structure. As for the expression of sentence mode, attitudes and emotions, it can partly be described in terms of ethological principles, such as the "Frequency Code" (Ohala 1983).

The phrase "syntactic intonation" may appear as somewhat of a misnomer, insofar as syntax and intonational phrasing do not stand in a strict, one-to-one relationship with syntactic units, as was already noted in the early classics of phonetics (Grammont 1933) and confirmed by later work (Selkirk 1972; Selkirk 2000, 231; Martin 1981). The phrase "syntactic intonation" is nonetheless retained in view of the fact that knowledge of a sentence's syntax offers a sufficient basis for the synthesis of an acceptable fundamental frequency contour (Vaissière 1971).

The acoustic correlates of prosody are many. They include the variations in fundamental frequency, duration and intensity and phonation type, but also the allophonic variations in the realization of the phonemes. Said differently, prosody has correlates at the respiratory level, at the glottis, and at the supra-glottal level. All parameters take part in prosody simultaneously, to a greater or lesser extent.

Intonational phenomena need to be factored out in order to identify the tones of an utterance.

1.2. The absence of fully satisfactory tools for intonational transcription

There does not yet exist a standardized system for transcribing intonation; this is easy to understand in view of the above overview of the complexity of this field. One orientation consists in describing them as if they were tonal, on a par with lexical tones. Numerous researchers, some of whom initially argued against the modelling of intonation into discrete levels (Ladd 1978), now advocate models whose basic tenets are familiar concepts of autosegmental tonology, such as level tones, downstep and tone spreading (witness the following textbooks: Ladd 1996; Gussenhoven 2004). This approach is known as ‘autosegmental-metrical’, and has dominated discussions of intonation since the 1980s (see Silverman et al. 1992, and the critical assessments by Wightman 2002 and Martin 2001; Gussenhoven 2004; and the textbook by Ladd 1996). Pitch accents, organized in a linear sequence, are considered as the building blocks of an intonation contour.

If one stands back to take a global view of tonal models of intonation, they appear as hybrid and somewhat perplexing systems, pooling together functional analysis, F_0 -curve stylization, and perceptual data. The tones that they posit are highly abstract entities, but the labels are often used as a phonetic transcription reflecting linguistically significant aspects of F_0 curves as they are actually observed. Also, tonal labels are assigned from an acoustic rather than perceptual point of view, whereas “boundary tones” are meant to reflect the perceived cohesion between successive words, and are thus grounded in perception rather than on the observation of F_0 curves. “To be fair to the original spirit of Janet Pierrehumbert, who intended to describe American English and carefully avoided generalization in her thesis, applying ToBI symbols to a new language requires a prior re-evaluation of the underlying principles” (Vaissière 2002).

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Alternatives to tonal models of intonation include the Kiel Intonation Model and its developments (Niebuhr and Kohler 2004; Kohler 2005; Niebuhr 2007; Niebuhr 2010), superpositional approaches (Vaissière 2002; Vaissière 2004; Vaissière and Michaud 2006; Grønnum 1991; Grønnum 1998a; Lindau 1986; Grønnum 1998b; Ladd 1998), and other approaches that have pre-generative roots (Delattre 1966; Fónagy 1989; Rossi 1999; Martin 1977; Hirst and Di Cristo 1998). These approaches are currently outside the mainstream of intonation studies, in the same way as non-autosegmental analyses of tone systems fall outside mainstream (generative) phonology (some reflections on this situation are set out in Michaud 2008; Zerbian 2010; Michaud 2012). My evaluation of the available evidence is that tonal accounts of intonation in tone languages run into considerable difficulties, and that it is better to adopt a vocabulary which suits the data, even if it is not mainstream at present, rather than force the data into inadequate models.

Rossi uses the notion of ‘intoneme’, parallel to ‘phoneme’ and ‘morpheme’; this ensures a clear distinction between an abstract level of description, on the one hand, and the level of phonetic realizations, on the other.¹ The present description aims to contribute to this strand of research, adopting a functional perspective.

As a final remark about terminology, the term ‘sandhi’ is not used here, because it appears advisable to restrict its use to categorical phenomena of context-conditioned tone change, and Na does not have any such phenomena.

2. Syntactic intonation: phrasing and junctures

The most important unit in the prosodic organization of Na speech is the tone group. But from the point of view of phonetic implementation, successive tone groups are not entirely independent. Tone groups are part

¹ This distinction is threatened in models that consider ‘tone’ as synonymous with F_0 . Hyman and Monaka (2008) define the term ‘tonal’ in a phonetic sense, to mean ‘realized by F_0 ’, and ‘non-tonal’ to mean ‘realized by parameters other than F_0 ’ (such as phonation types). The equation between ‘tone’ and ‘ F_0 ’ (and its perceptual counterpart: pitch) appears so self-evident that it could seem unnatural to try to define tone in any different way. But from a classical linguistic perspective, it appears crucial to make a distinction between F_0 , which is an acoustic parameter, and linguistic tone, which is a functional concept.

of higher-level prosodic units which can be defined in various ways; three units which appear especially useful as cross-linguistic descriptive concepts, though their definition is not without problems, are (i) the prosodic paragraph, (ii) the sentence (also referred to as ‘utterance’, with a view to bringing out its grounding in a communicative context), and (iii) the breath group. Here is a brief characterization of these levels, adapted from Vaissière and Michaud 2006, 50–52.

2.1. The prosodic paragraph

The highest F_0 value in a sentence tends to decrease from the first to the last sentence in a paragraph (Lehiste 1975). The end of the paragraph typically ends on an extra-low F_0 (often leading to a change in phonation type) and intensity. The term ‘paragraph’ is open to criticism on the part of linguists who object to the transfer of concepts from the study of written texts to that of oral speech; it is a convenient term nonetheless, as there is a real similarity between the division of a written text into paragraphs and that of speech into prosodic paragraphs, with a broad range of stylistic variation in both cases.

2.2. Sentence-level phenomena: declination and final lowering in declarative utterances

The sentence level is the next unit. The neutral, affirmative statement is taken as the basic, archetypal pattern, from which other sentence modes depart (Thorsen 1980). The F_0 curve for the sentence rises to a peak located on one of the sentence’s first syllables, typically within the first lexical word. In the course of the sentence, a phonetic, gradual, noncategorical decrease in fundamental frequency takes place: declination in the course of the utterance. Fundamental frequency therefore fluctuates within a gradually narrowed range. A final lowering marks the end of the sentence. (This corresponds to Tune 1 as described for English by Armstrong and Ward 1926.) Final lowering is a more local phenomenon, typically affecting the last syllable in declarative utterances.

Declination and final lowering are common across languages, as is their suspension to convey non-assertiveness (in questions, or to convey nuances of doubt and uncertainty).

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2.3. Breath groups

The sentence is further divided into breath groups by returns to the baseline. A long sentence may be divided into two or more breath groups by inspiratory pauses. The structure of a breath group recalls that of the sentence as a whole: a breath group is acoustically characterized at its beginning by a resetting of the fundamental frequency baseline, an initial rise, generally during the first content word, followed by a return to the baseline. Fundamental frequency reaches the baseline, and even goes below it, at the very end of the sentence. Nonfinal melodic phrases carry an intoneme of *continuation*; this corresponds to Tune 2 of Armstrong and Ward 1926.

From a phonetic point of view, these phenomena interact with phonological tones: the phonetic realization of a phonological H, M or L differs considerably depending on the position of the syllable in terms of the breath-group, the utterance, and the prosodic paragraph.

In my first notes, I transcribed the 1st, 2nd and 3rd-person pronouns with H tone, as [njɣɿ], [noɿ] and [tʂ^huɿ]; this was due to their realization on a high pitch in breath-group-initial position, in cases where they constitute a tonal group on their own. In that context, their pitch is noticeably higher than that of a M tone in tone-group-initial position later on in the breath group: see, among other examples, the contrast between the phonetic realization of /njɣɿ/ 'I' and /əɿsiɿ/ 'grandmother' in /njɣɿ | əɿsiɿ/ 'my grandmother', in the narrative Dog.56. Moreover, since the opposition between M and H is neutralized in tone-group-initial position, a phonetically very high realization runs no risk of being misinterpreted by native listeners. As a consequence, M tones in that position have the entire upper part of the tonal phonetic space as their range of intonational variation. In my first field notes, I transcribed 'I don't eat' as /*njɣɿ | məɿ-dzuɿ/; this is phonologically inappropriate, since M and H are neutralized to M in this context; but it is understandable, in view of the considerable phonetic difference in pitch between the first and second syllables, and of the similarity in pitch between the first and last syllables of this short sentence.

These intonational facts had to be brought to light before a correct transcription of the surface-phonological form of the pronouns could be arrived at: [njɣɿ], [noɿ] and [tʂ^huɿ], respectively. These pronouns all have M tone in isolation due to the neutralization, in this position, of the lexical categories L, M and H; their underlying phonological form is the following: /njɣɿ/, /noɿ/, and /tʂ^huɿ/.

3. Key factors in the phonetic implementation of tone

The following section sets out key factors in the phonetic implementation of tone – factors that are at play within the tone group and at junctures between tone groups.

3.1. Key factors in the phonetic implementation of tone within a tone group

3.1.1. Consequences of the weak realization of grammatical words

Following a well-attested cross-linguistic tendency, the lighter semantic weight of grammatical words relative to lexical words is reflected in a weaker phonetic realization. To use a concept proposed by Shih Chilin for speech synthesis, grammatical words have a lower strength coefficient. In Shih Chilin's model, the tones of syllables with a high strength coefficient are realized close to their lexical tone template, whereas the lower the coefficient, the stronger the coarticulation with following tones (Kochanski and Shih Chilin 2002).

A case in point is the prohibitive prefix /t^hɑː-/ . When it is followed by a reduplicated verb of tone class M_a, the tone pattern is M.H.L, e.g. /t^hɑː-kiː~kiː/ 'do not give away, do not distribute'. Phonetically, the syllable /t^hɑː/ is realized with rising fundamental frequency. Averaging across eight tokens, there is a 6.7% rise in F₀ (standard deviation: 3.6). This rise is probably too small to be perceived as such: glissandos need a minimum slope of about 14% over a long tone-bearing unit (over 300 ms) or 18% over a short tone-bearing unit (100 ms) (Rossi 1971; Gsell 1979). The amplitude of the rise during /t^hɑː-/ can be compared with the 16% jump in F₀ (standard deviation: 5.0) between the prefix and the H-tone syllable that follows.

The anticipatory rise in the course of the prefix /t^hɑː-/ is interpreted as a typical example of coarticulation between a M-tone syllable with a low strength coefficient and a following H-tone syllable with high strength coefficient.

3.1.2. The absence of oppositions between L.M and L.H, or between H.M and H.L

A key phonological fact about Yongning Na tone is that there exists no contrast between *H.M and H.L sequences (only H.L is observed), and that

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the contrast between L.M and L.H, which is postulated at the underlying phonological level, is neutralized in the surface-phonological forms. This leads to the following generalization: in Yongning Na, there exists no context where a two-step shift on the tone scale (i.e. from L to H, or from H to L) contrasts with a one-step shift (i.e. from L to M, or from H to M).

Said differently, for any pair of successive syllables within a tone group, it is enough to identify the tone of the second as being (i) higher than the preceding tone, (ii) identical to the preceding tone, or (iii) lower than the preceding tone.

This is unlike the closely related language Naxi, where all combinations of tones in disyllables are attested, so that L.H and L.M need to be distinguished, as do H.M and H.L.

This is reflected in the tonal implementation by the fact that L.M sequences tend to be realized with a very high M tone – much higher than that of the M tone in a L.M.H sequence.

3.1.3. *Anticipatory phonetic dissimilation in M.L and M.H sequences*

In some languages, phonetic anticipation of following tones takes place: in a L.L.H sequence, the second L tone is realized higher than the first, in a gradual progression towards the H tone (xxxxadd ref). The opposite happens in Yongning Na. If a M tone is followed by L, it is realized with a higher fundamental frequency than when followed by H. This has the effect of bringing out the contrast in pitch between M and the following tone. The M tone can be said to have three allotones: that found in front of L is the highest; that found in front of M is in a central phonetic range of F_0 ; and that found in front of H is the lowest.

Likewise, a L tone is realized lower in front of M or H than when followed by another L. Using the vertical position of letters to indicate relative pitch, an approximation of the phonetic realization of a M.M.L sequence would be [M.M.L], and a L.L.H sequence could be approximated as [L.L.H].

This links up with observations about the realization of like-tone sequences, L.L.L.. and M.M.M.. (*H.H.H.. sequences are never observed, since a H tone is always followed by Ls). Sequences of L tones decline gradually towards a final L target that is clearly low. The first L tone in such a sequence may be realized in a relatively high range of fundamental frequency: extracted from context, it may sound like [M]. This does not threaten its correct identification within the tone sequence: a sequence such

as L.L.L cannot be mistaken for M.M.L, because the latter sequence has to be realized with a considerable drop from M to L (approximation: [M.M.L]). In the absence of this slight upward jump in fundamental frequency, and of any sudden drop from one syllable to the next, the sequence is perceived as consisting of like tones. Likewise, a M.M.M like-tone sequence cannot be mistaken for M.M.L even if its last tone is depressed by intonational factors such as final lowering. Final lowering affects the last syllable, but does not raise the previous one (schematic representation: [M.M.M]), whereas a M.M.L sequence would comprise a noticeable raising of the syllable before last: [M.M.L].

These pieces of information are summarized in Table 1, where the symbol σ is used to stand for syllables.

Table 1. A schematic representation of the realization of some tone sequences in Yongning Na

phonetic sequence	interpretation	elements used in identification
[$\sigma.\sigma.\sigma.\sigma$]	M.M.M.M	gentle decline in F0; overall mid range of F0
[$\sigma.\sigma.\sigma.\sigma$]	L.L.L.L	slightly steeper decline in F0 than for all-M sequences; slightly lower endpoint
[$\sigma.\sigma.\sigma$]	M.M.M.L	raising of the third syllable, and clear difference in pitch between the last two syllables
[$\sigma.\sigma.\sigma$]	L.L.L.H	lowering of the third syllable, and clear difference in pitch between the last two syllables

Grasping the phenomenon of anticipatory phonetic dissimilation in M.L and M.H sequences is crucial to the recognition of tones in Yongning Na. This dissimilation allows for a great range of phonetic variation in sequences of L tones or M tones. L-tone sequences may start from a relatively high pitch, as long as they descend clearly towards a phonetic low target without intervening upward jumps in pitch. M-tone sequences may be strongly affected by declination (a phonetic, gradual, noncategorical decrease in fundamental frequency in the course of the utterance: see §xyz) without risk to their correct identification. Listeners confronted with a sequence of syllables of decreasing fundamental frequency, without noticeable upward jumps in fundamental frequency, can safely interpret this sequence as carrying M.M.M.. or L.L.L.. tones; the overall slope of the decrease in F₀, and

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the range of F_0 reached at the end of the sequence, allow the hearer to decide between M.M.M.. and L.L.L..

The anticipatory phonetic dissimilation in M.L and M.H sequences is especially salient, but preplanning in tone production is also noticeable at the level of the entire tone group. For instance, a group whose tones consist of the sequence M.M.H begins on a lower pitch than one with a M.M.M sequence, which itself begins lower than one with a M.M.L sequence. A striking example was unintentionally recorded by eliciting verbs in the frame /noʔ-ŋuʔ | ____-zo.ho/ ‘you are going to ____’: the sequence ‘you are going to eat’, /noʔ-ŋuʔ | dzuʔ-zoʔ-hoʔ/, was realized with very high pitch on the two M-tone syllables of the utterance-initial tone group, /noʔ-ŋuʔ/ (2sg-A), whereas the two next M-tone syllables, /dzuʔ-zoʔ/, were realized lower than average so as to maximize the contrast with the H tone that follows them. The result is a considerable drop in F_0 from /ŋuʔ/ to /dzuʔ/, despite their identical phonological tone. Likewise, in the elicited sentence /tʂʰuʔ | zɰæʔzoʔ-bvʔ | hoʔmiʔ ɲiʔ/ (‘This is the stomach of a colt’; document BodyPartsOfAnimals7.140), /hoʔmiʔ/ is realized distinctly lower than /zɰæʔzoʔ-bvʔ/.

These examples bring us to the topic of the resetting of reference values for tones at junctures between tone groups.

3.2. Resetting of reference values for tones at junctures between tone groups

A return to the baseline does not take place at each juncture between two tone groups. On the other hand, there is a resetting of reference values for tones at each juncture between tone groups, such that a M tone in final position within a tone group and another M tone in initial position within the following tone group can have widely different fundamental frequency values. This also relates to the fact that M tone in final position within a tone group contrasts with L, H, MH, and LH, which places great constraints on its position within the tonal space (from an acoustic and perceptual point of view), whereas a M tone in initial position within a tone group only contrasts with L – except in the special case of a monosyllabic tone group, of course.

3.3. The realization of /LM/, /LH/ and /MH/ contours

It was pointed out in Chapter xyzN_Lexicaltones_Nouns_Verbs that there only exist two types of contours on monosyllables at the surface-phonological level: low-rising and mid-rising. At the surface-phonological level, there is no opposition between /LM/ and /LH/ contours. Phonetically, the product of the neutralization is a low-rising contour whose endpoint is not as high as that of the /MH/ contour. To approximate phonetic realizations in terms of three levels, they are closer to [LM] than to [MH]. This makes sense both in terms of production and in terms of perception. In production, reaching as high a phonetic target for the low-rising contour as for the mid-rising contour would require extra effort, as the rise in F_0 would have to be greater. In perception, this would have the effect of making the phonetic realizations of the low-rising and mid-rising contours more similar, and hence less easy to distinguish. There are thus strong phonetic reasons why the product of the neutralization of /LM/ and /LH/ should be phonetically closer to [LM] than to [LH].

From the point of view of the tone system, this creates a tension between phonological categories and phonetic realizations. From a rough estimation based on the set of transcribed narratives, underlying /LM/ contours appear much less numerous than underlying /LH/ contours (the ratio is as low as 1 to 20). This is largely due to the high textual frequency of all-L tone groups, which receive the post-lexical addition of a H tone. Such statistical discrepancies between phonological categories and phonetic realizations hold a potential for reanalysis of the system by language learners – especially in the present social context, where exposure to Na is made more limited by the pervasive presence of Mandarin, so that children appear not to acquire the tonal system in its full complexity. This issue will be taken up in Chapter T_DynamicSynchronyOfTone.

4. Pragmatic intonation

4.1. Emphatic stress, and its toned-down avatars

Martine Mazaudon's use of an 'up' arrow ↑ to mark "intonational emphasis on the preceding syllable" (Mazaudon 2004) is adopted for the Na data, as in (xyz).

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(xyz) t^hiɿ̌ | əɬmɿ̌ɬjǐ-hĩ̌ | -dzoɿ̌ | ↑ zoɿ̌ nǐ-tsuɿ̌ | -mɿ̌.
t^hiɿ̌ əɬmɿ̌ɬ jǐ hĩ̌ dzoɿ̌
then older_sibling to_do NMLZ.AGT TOP
zoɿ̌ nǐ tsuɿ̌ mɿ̌
boy/son COP REP AFFIRM
‘The elder [of the two siblings] was a boy.’ (Sister.5)

In my first field notes, I jotted down ‘This is a man’s job!/This type of work [viz. plowing] is men’s part!’ as /*zoɿ̌-ŋuɿ̌ jǐɬ/. The correct notation is in fact /zoɿ̌-ŋuɿ̌ | jǐɬ/: the first two syllables, which constitute a tone group, carry the same surface-phonological tone (M). My initial notation was influenced by the intonational emphasis carried by the first syllable, which resulted in a much higher pitch on /zoɿ̌/ than on the following syllable; to boot, that syllable is a grammatical word and hence prone to intonational backgrounding, a phenomenon studied in §4.3.

4.1.1. *Emphatic stress as a language universal*

Emphatic stress in Na appears to be essentially the same as in English and French, hence the choice to use this label (proposed by Coustenoble and Armstrong 1937). Prototypical realizations of emphatic stress have been shown to involve supplementary activity of the expiratory muscles, resulting in a sudden increase in subglottal pressure during the articulation of a consonant (Benguerel 1973; Carton et al. 1976; Ohala 1978; Fant, Hertzgard, and Kruckenberg 1996), hence the term “force-accent” used by Kohler (2003). This category has been somewhat neglected in intonation studies, as tonal models of intonation led researchers to focus their attention mostly on the acoustic parameter of fundamental frequency. But it is a good candidate for the status of universal of human language. Its linguistic functions range from the attitudinal and emotional to the pragmatic: it is the most extreme manifestation of intonational emphasis. It is most often encountered in toned-down versions, physiological effort at a subglottal level being mimicked through such strategies as F₀ excursions and consonant lengthening. Needless to say, its description as a language universal by no means implies that it is uniformly present in different languages and different oral genres. Like other linguistic phenomena, it comprises important language-specific and speech-style-specific dimensions: its frequency of use varies greatly from language to language, from speaker to speaker, and

from style to style; its stylistic effect is inversely proportional to its frequency of use.

4.1.2. *The superposition of lexical tone and intonation*

The general approach adopted here is superpositional, distinguishing different levels: in particular, tone on the one hand, and intonational modifications (reflecting boundaries/junctures and information structure), on the other. Great care must be exercised in the analysis of these phenomena, maintaining the functional distinction between lexical tones and intonation. For instance, when picking up the ‘phone, speakers of Mandarin say “喂”, lexically a tone-4 syllable (Pinyin transcription: *wèi*), i.e. realized with sharply falling pitch; but in this context, the lexical tone is overridden by interrogative intonation, and the pitch is typically rising. One interpretation would be that the initial tone, tone 4, becomes another tone: say, tone 2, the rising tone. But rather than treating this case as an instance of tone change, it makes better sense to consider it as an extreme example, where the lexical tone has so little communicational relevance, and the expression of sentence mode and speaker attitude such an importance, that their superposition leaves little trace (if any) of the lexical tone.

A compromise has to be found, in each speech act, between the competing demands of clarity, on the one hand, and expressivity, on the other. It seems clear that Na speakers are careful to avoid too great a distortion to the tonal string due to intonational emphasis. While no specific phonetic study has so far been conducted on Yongning Na data, it seems reasonable to assume that the situation is comparable to Naxi, where a study of the three basic tones (H, M and L) under emphasis reveals a relatively milder effect of emphasis on F_0 than on intensity, as compared to English data (Michaud 2005, 107–167).

4.1.3. *Cases where intonation interacts with the tonal string*

In some marginal cases, intonational modifications go so far as to affect the string of tones for the utterance, however. In its most vehement manifestations, emphatic stress intrudes into a sentence’s prosody, wreaking havoc on tonal contrasts. Example (xyz) is a case in point.

(xyz) p^hvJ-tɕæŋqæJ-gvJ-kvJ-zeJ-mæJ
 p^hvJ-tɕæŋqæŋ gvJ kv+ŋ -ze -mæ

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very_white to_prepare abilitive accomp affirm
 ‘[after boiling, linen thread] can become really white!’ (FoodShort-age.73)

The usual pronunciation is /p^hvJ-tɕæJɿæ/ ‘very white’. In (xyz), the second syllable is realized phonetically with extremely high fundamental frequency on the syllable /tɕæJ/, which is considerably lengthened. From a phonetic point of view, its phonetic L tone is conspicuously disregarded. One way of looking at this modification would be to describe it as due to an intonational overlay: functionally, one could consider transcribing as /p^hvJ-↑tɕæJɿæ-gvJ/, where the arrow ↑ indicates emphatic stress, and the underlying tonal string is unchanged.

This forcible intonational modification does interact with the phonological tone string of the tone group, however. If the modification of the second syllable in /p^hvJ-tɕæJɿæ-gvJ/ only took place on an intonational level, one would expect the underlying tonal string to remain unchanged, in which case the third syllable would retain its phonological H tone. But what is observed is that the third and fourth syllables in (xyz) are lowered to L: /ɿæJ-gvJ/. This is precisely what is expected if the second syllable carries H tone. This phenomenon is therefore analyzed as involving a categorical tone change, from a L.L.H sequence, /p^hvJ-tɕæJɿæ/, to a L.H.L sequence, /p^hvJ-tɕæJɿæJ/.

- 4.2. Focalization through local intonational modification of tone: changing a H or M level to a dipping contour, or expanding the phonetic range of a MH or LH rising contour

4.2.1. *The main facts*

In Yongning Na, one means of emphasizing a word within a sentence consists in a rapid dipping contour, as in example (xyz).

(xyz) hĩ-t-kĩ-t | ɕu-t-k^hwɣ̃ F | mə-t-pĩ
 hĩ ki ɕu-t-k^hwɣ̃ mə pi
 person to 1-CLF_pieces NEG say
 ‘(S)he did not say anything to the people present! / (S)he did not greet anyone!’ (Field notes, 2009)

The classifier /k^hwɿ/ is realized with a noticeable fall, and is lengthened. This phenomenon takes place in rapid speech as well as in slow repetitions, which shows that it is independent of speech rate.

It was later realized that the same type of prominence-lending local intonational modification could also be found for the two rising contours: high-rising (MH) and low-rising (LH). For these contours, the modification consists in F₀ range expansion, and lengthening. Due to the phonetic fact that these are phonological contours, which by themselves have greater duration than simple levels, the intonational modification is less salient than for the M and H levels.

This phenomenon will be referred to, for short, as *intonational focalization*. The notation adopted is ‘F’ (for ‘Focalization’), written after the syllable at issue. This may seem inconsistent with the choice to place the upward arrow for emphatic stress (↑) *before* the syllable that receives emphatic stress. There is a phonetic basis for this different treatment, however: although both phenomena affect entire syllables, emphatic stress is strongest at the *beginning* of the syllable, whereas intonational focalization is implemented through a modification that strongly affects the syllable *rhyme*.

On the analogy with Naxi, where a reduced M- or L-tone syllable can result in the creation of similar contours (Michaud and He Xueguang 2007), it was first hypothesized that there must be a reduced syllable in examples such as (xyz): /*dʷɪt-k^hwɿ-əɿ mət-pi/. Likewise, the polite invitation to eat, /əɿ-dzɿt~dzɿt F | dzuɪ/ (literally ‘Eat slowly!/Take your time!’) was initially transcribed as /*əɿ-dzɿt~dzɿt-əɿ dzuɪ/. Subsequent investigation showed that this was not the case, however. The dip in fundamental frequency, accompanied by lengthening and formant movement towards a central vowel, is a purely intonational device to set part of the utterance into relief.

The realization of focalization is sufficiently specific – involving a movement in fundamental frequency, a slight lengthening, and a slight change in the vowel: a difference in the time course of formant frequencies – to avoid interference with lexical tone. Emphatic tone is likewise identifiable as such, from cues other than fundamental frequency. This greatly limits the possibility of a misperception of lexical tone caused by these intonational phenomena.

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4.2.2. *Borderline cases, opening into a discussion of the categorical status of the phenomenon*

As of 2013, some 220 cases of intonational focalization were indicated in the transcribed texts. There are borderline cases, where it is not crystal-clear whether to add a ‘F’ in the transcription or not. Although this is a good candidate for the status of *categorical* phenomenon, some cases are clearer than others. In particular, cases where this focalization is superimposed on rising contours appear less salient – for phonetic reasons, as outlined above.

xxxx Maybe an influence of Yunnan Mandarin? Suggestion of reviewer of contribution to *Oxford Handbook*. Suggested procedure for checking: studying the intonation of local speakers when using Chinese.

4.2.3. *A case of habitual association of intonational focalization to a phrase, illustrating the affinities between focalization and negation*

The classifier /saŋ/ ‘thing’ only appears in the phrase /ɕurɫ-saŋ/ ‘anything’, itself restricted to negative contexts: typically /ɕurɫ-saŋ | məɫ-dzoɫ/ ‘there isn’t anything/there is nothing at all’. Out of 30 examples found in transcribed narratives (as of 2013, i.e. in a total of 25 narratives), all except one are accompanied by intonational focalization: /ɕurɫ-saŋ F | məɫ-dzoɫ/ ‘there isn’t anything’, /ɕurɫ-saŋ | məɫ-jiɫ/ ‘(people) do not do anything/do not work at all’. This illustrates the cross-linguistic affinity between focalization and negation (yyyy TO BE EXPANDED/ADD REFERENCES & DISCUSSION).

One example without intonational focalization was observed, however, demonstrating that the habitual association of this focalization with /ɕurɫ-saŋ/ cannot be considered a lexicalized characteristic in F4’s speech. This example is from *TraderAndHisSon*.24.

4.2.4. *Intonational focalization and the division of the utterance into tone groups*

As discussed at some length in Chapter XYZ, the division of the utterance into tone groups is a fundamental dimension of Yongning Na prosody. The sifting of examples reveals that intonational focalization does not necessarily entail the presence of a following tone-group boundary, as shown by *BuriedAlive*3.143. In the vast majority of examples, such a boundary is

5. Expressive and iconic phenomena

The observations grouped in this section are simply offered as introductory guidance for the study of expressive and iconic phenomena in Na. Needless to say, a systematic experimental investigation into patterns of tonal coarticulation and intonational modifications of tone in Yongning Na would yield a more fine-grained picture than could be presented here.

5.1. Towards the loss of lexical tone on some grammatical words through habitual intonational modifications

The extra distal locatives /dɣɿ-qoɿ/, /dɣɿ-tɕʰuɿqoɿ/, /dɣɿ-tʰvɿqoɿ/ and /dɣɿ-tʰvɿ-gi#ɿ/ share the same intonation.

There exists a parallel set with /gɣɿ/ as its first syllable, from /gɣɿ-/ ‘upward’: /gɣɿ-qoɿ/, /gɣɿ-tɕʰuɿqoɿ/ and /gɣɿ-tʰvɿqoɿ/ ‘way up there’, and /gɣɿ-tʰvɿ-gi#ɿ/ ‘way up, in that direction’.

For both sets, the realization of the first syllable is highly expressive and allows variants. Either it starts on an extra-high pitch and glides downward, at a slope left to the speaker’s discretion: a sharp fall or a prolonged one. Or it is rising, the details of the rise (duration and slope/maximum peak) being again left to the speaker’s discretion. As far as could be ascertained, the sharply falling variant insists on the great distance to the place at issue (paraphrase: ‘in a place far, far away’), whereas the rising variant is used to direct the speaker’s attention to the place at issue, against a background of shared knowledge (paraphrase: ‘that faraway place, you know’). Use of tone marks to stylize the perceived pitch of this syllable, such as /dɣɿ̌/ or /dɣɿ̎/, would introduce a potential for confusion between lexical tone and intonational phenomena, hence the choice to use an exclamation mark instead, even though this is under-specific in phonetic terms. Devising a set of symbols for more detailed transcription would require a full-fledged study of expressive phenomena in Na, which could propose a division into types, each of which may further allow for parametric variation, e.g., for a falling contour, the temporal position of the peak, its position within the speaker’s F_0 range, and the slope of the following fall.

It is an issue how to transcribe tone on the initial syllable of these extra-distal locatives. Identification of the morpheme /gɣɿ-/ ‘upward’ is not problematic, as it is attested elsewhere in the language with the same meaning that it has in the extra-distal locatives. On the other hand, the syllable /dɣɿ/ is peculiar not only in its intonational realization, but also in its segmental

composition. This syllable is only unattested in Na (i) in these extra-distal locative expressions, and (ii) followed by /ɿ/, in /hỹ-dɿ-ɿ#ɿ/ ‘clumsy’ and /õ-dɿ-ɿ#ɿ/ ‘fundamental(ly)’. The two sets of extra-distal locatives (beginning with /gɿ-ɿ/ and /dɿ-ɿ/) share essentially identical intonation; but this intonation is so distant from what one would expect on the basis of the lexical L tone of /gɿ-ɿ/ ‘upward’ that it looks like a case of neutralization of tonal oppositions (on the first syllable of these locatives), and it would be unwise to posit an initial lexical L tone in /dɿ?-qoɿ/, /dɿ?-tɕʰuɿqoɿ/, /dɿ?-tʰvɿqoɿ/ and /dɿ?-tʰvɿ-gi#ɿ/ on the analogy of the /gɿ-ɿqoɿ/, /gɿ-ɿtɕʰuɿqoɿ/, /gɿ-ɿtʰvɿqoɿ/, and /gɿ-ɿtʰvɿ-gi#ɿ/ set. A notation of /dɿ-ɿ/ with M tone is provisionally adopted, on the basis of the impression that its rising realizations appear to have a somewhat higher starting-point than those of rising realizations of /gɿ-ɿ/. The considerable intonational modification of these syllables is transcribed in narratives through the addition of the mark for emphatic stress ↑; this mark does not tell the full story, but has the advantage of bringing attention to the presence of a strong intonational modification resulting in a gap between the hypothesized lexical tone and the surface realization. Such situations hold a potential for the neutralization of lexical tone oppositions: assuming that /gɿ-ɿ/ and /dɿ?-ɿ/ initially carried different lexical tones, it is fair to say that the opposition at present is at best vestigial. This is an example of change in progress; xxxx antagonistic forces: ge- still perceivable as meaning ‘above’ (to expand xxxx)

6. Examples of mistaken interpretations of tonal sequences for want of taking tone implementation rules into account

Some examples of early, mistaken notations are discussed below: they shed light on the process of categorical interpretation of the pitch of successive syllables. This section thus serves as a recapitulation of the regularities described above, and their interplay.

6.1. Anticipatory dissimilation before a L tone

The tone sequence M.M.L was often mistakenly transcribed as M.H.L, for instance in the determinative compound ‘tiger’s ear’, /laɿ-ɿiɿpiɿ/, initially transcribed as /*laɿ-ɿiɿpiɿ/. This is because the pitch of /ɿiɿ/ is higher than that of /laɿ/, due to anticipatory dissimilation before a L tone; successive pitch levels can be stylized as follows: [M.M.L]. This difference in pitch is

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a cue to the M.L sequence; it is important to the identification of the tone of the third syllable as L, instead of a M tone lowered by declination or final lowering. But it must be factored out when determining the tone of the syllable /4i/ itself.

6.2. The interplay between morphosyntactic information and phonological information in speech comprehension

The tone sequence M.L.L.L was initially transcribed as LM.M.L.L in /ləʔ-mvɫp^hæɹ-zeɹ/ ‘...have forgotten’ (ACCOMP-to_forget-PFV), mistakenly transcribed as /*ləʔɫ-mvɫp^hæɹ-zeɹ/ on my first field trip. This transcription is relatively close to the phonetic realization, with a slight rise during the first syllable, and a gradually declining fundamental frequency during the three syllables that follow, with a clearly low phonetic target on the last syllable. In order to identify the correct tone sequence, a crucial piece of information consists of the overall higher fundamental frequency on the first syllable. Details in its phonetic contour must be overlooked: whether it is flat, rising or falling is phonologically irrelevant in this context, since phonological contours are only found in tone-group-final position. This piece of information points to a difference in phonological level between the first syllable and those that follow. Since the first tone in a tone group can only be M or L on the surface-phonological level, the first tone must be M, and those that follow can only be L. This example illustrates the interplay between morphosyntactic information and phonological information in speech comprehension: the identification of this sequence as one syntactic phrase (a verb phrase) helps identify it as one single tone group, which in turn provides precise guidance in tone identification.

6.3. Resetting at junctures between tone groups

At a stage when I had not yet worked out clearly the existence of tone groups, the sentence /njɣɫ-ŋuɫ | hwæɫ-biɫ-zeɫ/ (‘I’m paying for it! I’m the one who’s buying [it]!’), was transcribed as /*njɣɫ-ŋuɫ hwæɫ-biɫ-zeɫ/: the sequence of three M tones on the last three syllables was identified correctly, but it seemed obvious that the tone of the first two must be higher, hence the choice to transcribe them as H. Once it was recognized that there were two tone groups here, the considerable phonetic difference in pitch between the two groups could be interpreted as due to a difference in their baseline; indeed, this difference may serve as a cue to listeners that there

are two tone groups here. There is no risk that a proficient speaker of Yongning Na will interpret the high pitch on /njɣ-t-ŋu-t/ as the realization of a H.H sequence, since such sequences are never found in Na (due to rule xyz: within a tone group, a H tone can only be followed by L tones).

Similar examples include /*no | hwæt-hō-t/ ‘You go and buy [it]!’ instead of /no | hwæt-hō-t/; /*njɣ-t-ŋu | dɯ-t-kʰwɣ-t dze | ‘I cut a piece’ instead of /njɣ-t-ŋu | dɯ-t-kʰwɣ-t dze |; /*tʂʰu | ɤwɣ-t ɲi | ‘This is a mountain’ instead of /tʂʰu | ɤwɣ-t ɲi |; /*ɤwɣ-t dɯ-t-lu-t/ ‘one mountain’ instead of /ɤwɣ-t | dɯ-t-lu-t/; /*dzɯ | dɯ-t-tʰɣ-t/ ‘a drop of water’ instead of /dzɯ | dɯ-t-tʰɣ-t/; and /*mv | tʰi-t-tsʰi-t/ ‘to light a fire’ instead of /mv | tʰi-t-tsʰi-t/. In all of these cases, I based my transcription on the perceived similarity in pitch between successive syllables, overlooking the fact that this comparison must not be made across tone groups, as the baseline is modified from one tone group to the next.

6.4. The effects of pragmatic intonation

In my first field notes, ‘to play erhu (Chinese violin)’ was transcribed as /*ku | tɣ-t/, instead of /ku | tɣ-t/, due to an intonational strengthening of the verb: the phrase was provided as an answer to the question of which verb is associated with ‘erhu, Chinese violin’ (I began a sentence, /tʂʰu-t-ŋu | ku | tɣ-t.../, ‘(S)he... the violin’, while making the gesture of playing), so that the consultant emphasized the verb in her answer.

Likewise, the sentence ‘It’s not the same!’, /dɯ-t-bæt | mə-t-tsɣ-t/, was initially transcribed /*dɯ-t-bæt | mə-t-tsɣ-t/, with H tone on the verb; I believe that this was because the verb /tsɣ-t/ is realized phonetically with higher fundamental frequency than the preceding negation, which as a grammatical morpheme is intonationally weaker.

‘The sky is cloudy’ was transcribed as /*mv-t-ko | tɕu-t/ instead of /mv-t-ko | tɕu-t/; the final syllable has a high informational load, and received some intonational emphasis.

Chapter 11

Areal and typological discussion

This chapter groups discussions of issues pertaining to Yongning Na (i) in its broader areal context, and (ii) in a more general typological perspective.

1. A comparison with other Sino-Tibetan languages

1.1. Overall structure of the system

Tonal systems thus based on levels (tone heights) are relatively unusual in Sino-Tibetan, but not unheard of: examples include Pumi (Ding 2006, Jacques 2011), Mianchi Qiang (Evans 2008), Shixing (Chirkova et al. 2009), Hakha Lai (Hyman et al. 2002) and Kuki-Thaadow (Hyman 2010)

1.2. Role of the number of syllables of the words involved a given tone rule

Compound nouns where 1 of the 2 input nouns has more than 2 syllables: no tone change takes place (cf §xyz of Chapter xyz). The influence of the number of syllables on the type of phonological processes that take place in compounds is a point of similarity with other languages of the area, such as Shixing.

1.3. Degree of lexicalization of polysyllables and tonal treatment

In Laze, there is no tone change in compounds until lexicalization takes place, at which point tonal contrasts are massively neutralized [xxxx expand]. Lexicalization plays a less considerable role in Yongning Na, but its effect surfaces in a few places [xxxx provide list of cross-references within the volume].

1.4. [xxxx TO BE CONTINUED]

XXXXX

XXXXX

1.5.

2. Typologists' corner

The purpose of this section is to summarize some points of typological interest, for typologists who want a quick view of potential contributions of the present case study to typology.

2.1. Typological background to the classification of Yongning Na tones as “level tones”

2.1.1. Tonal typology: a divide between level tones and complex tones?

In what can be broadly termed as “Africanist” usage, “level tone” refers to *a tone that is defined simply by a discrete level of relative pitch*. Level-tone systems have two to five levels of relative pitch: L vs. H; L vs. M vs. H; L vs. M vs. H vs. T(op); or B(ottom) vs. L vs. M vs. H vs. T(op). Systems with more than three levels are relatively uncommon (Bariba: Welmers 1952; Bench, a.k.a. Gimira: Wedekind 1983; Wedekind 1985). One single case of six-level system has been reported: Chori (Dihoff 1977), for which a reanalysis is possible (Odden 1995). The above languages are spoken in Sub-Saharan Africa, a domain where level tones are especially common. However, level-tone representations have proved useful beyond the Sub-Saharan domain, for which they were initially developed (on languages of the Americas: Gomez-Imbert 2001; Hargus & Rice 2005; Girón Higueta & Wetzels 2007; Michael 2010; on languages of Asia: Ding 2001; Hyman & VanBik 2002, 2004; Donohue 2003, 2005; Evans 2008; Jacques 2011). In Yongning Na, the morpho-phonological alternations studied at length in the chapters that precede provide overwhelming evidence for a level-tone analysis. In level-tone systems, a phonetic contour is *the realization of two or more level tones on a single syllable*. The contours are phonologically de-

composable; the observed movement in F_0 is the result of interpolation between the successive levels.

There are some languages for which attempts at the decomposition of contours into levels has been less successful, however, to the point of casting doubt on the relevance of decomposition for these languages. In the Austroasiatic and Tai-Kadai language families, no convincing evidence is found for the decomposition of contours into simpler units. Chao Yuen-ren's work on Mandarin Chinese in the early 20th century (Chao Yuen-ren 1929; Chao Yuen-ren 1933) brought to the attention of linguists the complexities of its tone system. Following sustained exchanges with Chao Yuen-ren, Kenneth Pike proposed a typological divide between two types of tones: (i) register-tones, defined simply in terms of discrete pitch levels, and (ii) contour-tones, about which he concludes: "the glides of a contour system must be treated as unitary tonemes and cannot be broken down into end points which constitute lexically significant contrastive pitches" (Pike 1948:10). Later studies have brought out the importance of durational properties and phonation-type characteristics. In some prosodic systems, phonation types are a redundant, low-level phonetic characteristic of some tones; in others, they are a distinctive feature orthogonal to tone, as in the Oto-Manguean languages Mazatec (Garellek & Keating 2011) and Trique (DiCanio 2012); finally, in a third type of system, phonation-type characteristics are part and parcel of the definition of tones. Experimental studies of this third type of tone system include Rose (1982, 1989a, 1990) for the Wu branch of Sinitic; Edmondson et al. (2001) for Yi and Bai; Mazaudon and Michaud (2008) for Tamang; and Andruski and Ratliff (2000), Andruski and Costello (2004), Kuang (2012) for Hmong. Pike's two-way typology of tone, while it emphasizes typologically relevant properties of the languages which he was able to take into consideration, has some limitations in this respect: characterization as "contour tones" may not be an adequate label for tones such as those of Vietnamese, which contrast with the other tones of the system through a set of characteristics that include specific phonation types in addition to the time course of F_0 (Mixdorff et al. 2003; Tran et al. 2007; Brunelle, Nguyễn Khắc Hùng & Nguyễn Duy Dương 2010; Nguyen & Tran 2012; Nguyen et al. 2013). For this reason, the term "complex tones" is used below in preference to Pike's "contour tones". To recapitulate the terms used in the present discussion: *level-tone systems* are based on discrete levels of relative pitch, unlike *complex-tones systems*.

Complex tones include Pike’s category of “contour tones”, with the explicit addition of tones that comprise phonation-type characteristics.¹

Under this set of definitions, “contour” refers to a unitary contour: a tone defined phonologically in terms of an overall template specifying the time course of F0 over the tone-bearing unit. Phonologically unitary contour tones are encoded as an overall shape: “there are no objective reasons to decompose Vietnamese tone contours into level tones or to reify phonetic properties like high and low pitch into phonological units such as H and L” (Brunelle 2009a, 94; see also Brunelle et al. 2010; Kirby 2010). In this type of system, the term “level tone” is used to refer to *a tone that does not exhibit any salient fluctuations in F0*. For instance, Mandarin tone 1 and Vietnamese tone A1 (orthographic *ngang*) can be referred to as “level tones” because, unlike the other tones of Mandarin and Vietnamese, their F0 curve is relatively stable in the course of the syllable. This does not entail that they are phonologically defined by a discrete level of relative pitch (on Mandarin: see Xu & Wang 2001).

The two types of phonological contour tones – sequences of levels on the one hand, unitary contours on the other – can be phonetically indistinguishable, so that phonetic observation must be related to functional-structural levels of description. The evidence for distinguishing the two types of contours is morpho-phonological. A rising contour in an African language will typically exhibit phonological behaviour showing that it consists of a low level tone followed by a high level tone (see in particular Clements & Goldsmith 1984; Clements & Rialland 2007). In Yongning Na as in many languages, there is a wealth of evidence for the analysis of contour tones into sequences of level tones. From a typological point of view, instead of positing that all tones can be decomposed into levels, it is at least as reasonable to adopt the opposite standpoint, viewing contours as non-decomposable units unless there is positive evidence to the contrary (Nick Clements, p.c. 2008).

¹ Note that this differs from the definition used in the World Atlas of Language Structures, where “complex” refers to the number of oppositions, not to the nature of the tones: “[t]he languages with tones are divided into those with a simple tone system — essentially those with only a two-way basic contrast, usually between high and low levels — and those with a more complex set of contrasts” (Maddieson 2011).

Needless to say, the two-way distinction between level tones and complex tones is by no means water-tight. Borderline situations are likely to exist. As typologists have ample occasion to verify, “structural categories of language are language-particular, and we cannot take pre-established, *a priori* categories for granted” (Haspelmath 2007:129). The distinction between level tones and complex tones is proposed as a rule-of-thumb initial distinction; it aims to bring attention to a considerable amount of interesting Asian data that are likely to lie below the radar of some prosodic typologists and which deserve to be more widely appreciated.

An advantage of this prosodic perspective is that it draws attention to potential implications of the current language contact situation in the Yongning area, where level-tone systems are in contact with complex-tone systems.

2.1.2. Present-day sociolinguistic situation of Yongning Na: contact with a complex-tone system (Mandarin Chinese)

The above typological perspective highlights a situation shared by Yongning Na and other languages of China that have level-tone systems (such as Pumi): they are currently in intense contact with varieties of Mandarin Chinese (Standard Mandarin and Southwestern Mandarin), which have complex tones (undecomposable contours). In Naxi, this contact arguably played an important role in the lexicalization of a new tone, the rising tone, which emerged in a system that contained three levels: High, Mid and Low (Michaud 2006; Michaud and He Xueguang 2007). A lexical contour (rising) tone thus coexists with three lexical level tones that participate in some synchronic processes of tonal reassociation. It is unclear to what extent Naxi speakers, most of whom are highly proficient in Southwestern Mandarin, keep the tone systems of Naxi and Chinese cognitively distinct: specifically, it is an issue to what extent the Naxi rising tone is perceived as a unit (like contours in Chinese) or as a combination of levels. To venture a hypothesis, the lexical rising tone of Naxi seems to behave essentially like an undecomposable contour.

Such is currently the case of all the level-tone systems of China, e.g. Pumi, Naxi and Na

In Yongning Na, contact with Mandarin does not appear to have left conspicuous traces in the tonal system as yet. The Yongning Na sociolinguistic scene currently offers interesting opportunities for studying the effects of bilingualism – specifically, *non-egalitarian bilingualism*, to take up

a notion from Haudricourt (1961) – in languages with highly different tone systems. Like many other research questions, these have not yet been investigated.

2.2. Tonal rules

2.2.1. *Neutralization of some of the oppositions in isolation*

The partial neutralization of lexical oppositions when words are said in isolation is found in numerous tonal systems, including Japanese (Kubozono 1993) and San Juan Quiahije Chatino (Oto-Manguean family) (Cruz 2011, 91).

2.3. Morpho-phonological complexity

In comparison with its immediate siblings (Naxi and Laze), Na presents a high degree of morpho-phonological complexity. Some dimensions of this complexity are recapitulated below and compared with other languages, not on the basis of phylogenetic or areal closeness but on the basis of synchronic similarities.

2.3.1. *Partly regular morphotonology*

Partly regular morphological paradigms are cross-linguistically widespread. Examples (picked among readings) include

- the inflection of interrogative pronouns in the Australian language Anguthimri (Crowley 1981, 172);
- the inflection of transitive verbs in Dinka (Andersen 1993, 8; cited by Remijsen and Ladd 2008, 178): while certain inflections are marked by a particular toneme for all verbs alike, other inflections are specific to particular classes of verbs.

2.3.2. *Overall complexity of numeral-plus-classifier phrases*

While the type of complexity found in Yongning Na numeral-plus-classifier phrases is not as spectacular as that found in the Ahmao language (Hmong-Mien family), where classifiers have “12 basic forms, each dis-

playing a complex cluster of meanings” (Gerner and Bisang 2009), the Na data may nonetheless have a contribution to make to typological generalizations, showing that the tones of classifiers can be more complex than those of nouns (in Na: 9 tonal categories for classifiers, versus 5 for monosyllabic nouns). [xxxx TO BE CONTINUED]

xxxxx

2.4. Limitations on tonal oppositions

L tone spreads, whereas H tone does not.

The number of possible tone sequences is limited. There is no lexical contrast between a fall from M to L and one from H to L. This is a difference from systems such as those of Gulmancema (Gurma; Gur group), which have both.

H tone has a tendency to be realized late within the tone group: on the last syllable of the root (H#) or the morphological word (H\$), or even on the syllable following (#H).

[xxxx Add discussion of links to intonation]

2.5. The status of M tone

Unspecified lexically on its own, but specified as part of LM contours. Not an isolated case: in Yoruba, for example, the M tone is not lexically specified: the only two lexical tones are L and H, but following its insertion through default-tone assignment rules, M later behaves as a specified tone in derivations (Akinlabi 1985). Thus, M tone has a dual status [xxxx TO BE EXPANDED]

2.6. Intonational typology

An important fact about Yongning Na is that it does not have tonal intonation. This section sets out the typological background to this observation.

2.6.1. *Instances of intonational tones in the world's languages*

There are some well-established cases where intonation is encoded by tones that are treated on a par with lexical tones and morphological tones: in

some tonal languages, tone can serve as a marker for functions at the phrasal level. These will be referred to as *intonational tones*. This extension of the notion of tone beyond its primary meaning (lexical and morphological tone) is made in view of the structural similarities between lexical and morphological tone, on the one hand, and certain intonational phenomena, on the other hand; it does by no means amount to a broadening of the concept of tone to intonational phenomena in general, as is the case in some versions of autosegmental-metrical models of intonation.

First, tone may indicate sentence mode. “The most commonly encountered cases involve a tonal means to distinguish interrogatives from declaratives. In Hausa, a L is added after the rightmost lexical H in a yes/no question, fusing with any pre-existing lexical L that may have followed the rightmost H (...). As a result, lexical tonal contrasts are neutralized. In statements, [káì] ‘head’ is tonally distinct from [káí] ‘you [masculine]’. But at the end of a yes/no question, they are identical, consisting of an extra-H gliding down to a raised L” (Hyman & Leben 2000:61). The Hausa example is described as a case of intonational tone, rather than a case of superimposition of an intonational contour onto an underlyingly unchanged tone sequence.

Second, tone may serve phrasing functions. In some languages, certain junctures of the utterance are characterized by the addition of boundary tones, which, though introduced by post-lexical rules, are integrated into the tone sequence of the utterance on a par with lexical tones. L. Hyman (personal communication) points out that such phenomena are “rampant in African tone systems”, taking the example of a phrase-final boundary tone in Luganda: this tone is transcribed as H%, where the %, representing a boundary, is a functional indication of the tone’s origin. It acts just like any level tone, except that it is inserted into the tonal string later than the lexical tones. Any sequence of preceding toneless moras will be raised to that H level (though there has to remain at least one L before it). For example, /omulimi/ ‘farmer’ is pronounced all-L as subject of a sentence (/òmùlimì/), but at the end of an utterance marked by this H%, it is pronounced L-H-H-H: /òmúlímí/.

A third intonational function that may be served by tone is to convey prominence. A clear example of intonational tone (a tone of intonational origin) is encountered in Naxi: a word that carries lexical L or M tone on its last syllable can be focused by addition of a H tone that aligns at the right edge of the word, causing the tone of the last syllable to become rising (Michaud 2006:72).

In order to understand how intonational tones emerge and evolve, it appears interesting to examine not only clear-cut cases as those reviewed in this paragraph, but also doubtful cases of intonational tones.

2.6.2. *Doubtful cases of intonational tones: crossing the fine line between intonation and tone?*

Scholars have long been aware of the phonetic similarities between (phrasal) intonation and (syllable-based) tones. In the mid-17th century, the European authors who devised a Latin-based writing system for Vietnamese (de Rhodes 1651) had to develop a notation for a six-way tonal contrast. One of the tones was left unmarked; grave and acute accents were used for two others, and tilde for a fourth one. For the remaining two tones, symbols from sentence-level punctuation were used: the full stop was added (below the vowel) to indicate tone B2 (orthographic *nặng*) on the basis of the perceived similarity between its final glottal constriction and the intonational expression of *finality*; and the question mark (in reduced form, on top of the vowel) was used for tone C1 (orthographic *hỏi*) due to its final rise (Haudricourt [1949] 2010). To the authors of this system, the newly coined tone marks served as mnemonic cues to the pronunciation of tone, via an analogy with intonation in Romance languages. In this instance, there is no possible confusion between lexical tone and intonation; but there exist cases where a language's lexical tones are reported to serve intonational purposes. Phake (Tai-Kadai language family) exemplifies the diversity of situations found in Asian languages.

The expression of negation and sentence mode in Phake

Phake, a Tai-Kadai language of Assam (India), has six lexical tones, and cases of “changed tones” (Morey 2008:234–240). There are two different processes. (i) If a verb has the second tone (High falling), it changes to rising when negated. This rising tone is identical in form to the rising tone (no. 6); this is perceived by the speakers as a categorical tone change. This process appears to be spreading to verbs carrying other tones (S. Morey, p.c.). (ii) According to observations made in the 1960s and 1970s, changing the lexical tone of the last syllable in a sentence to the sixth tone (a rising tone) would express a question (Banchob 1987). More recent fieldwork reports the same phenomenon, but instead of identifying the “changed tone” with one of the six lexical tones, it is suggested that it is “a special

questioning tone (...). This questioning tone first rises and then falls, and here is arbitrarily notated as 7” (Morey 2008:234). Finally, an eighth tone is reported: an “imperative tone”, “that exhibited glottal constriction and creaky voice” (Morey 2008:239). Observation (ii) can be reinterpreted as cases of neutralization of tonal oppositions: it is not appear implausible that question intonation in Phake overrides the lexical tone of the sentence’s last syllable in questions, and imperative intonation has a salient influence on some tense-aspect-mood markers, which may go so far as to override their lexical tone. “The fluctuating needs of communication and expression are reflected more directly and immediately in intonation than in any other section of the phonic system” (Martinet 1957). The phonation type associated to imperative mode – a contraction of the laryngeal sphincter, to convey an attitude of authority – appears to have a clear iconic motivation (see Fónagy 1983:113–126).

It is perhaps significant that “changed tones” are reported in an area where the dominant languages are non-tonal. Speakers of Phake are also fluent in Assamese, a non-tonal language, which may create a pressure towards the simplification of the Phake tone system, e.g. through neutralization of tonal contrasts in some contexts. Overall, it would seem that intonation does not easily win the day over lexical tone. Some experimental evidence on this topic comes from a study of the Austroasiatic language Kammu, one of few languages with two dialects whose only major phonological difference is the presence or absence of lexical tones. A comparison of the two dialects concludes that the intonational systems of the two Kammu dialects are basically identical, and that the main differences between the dialects are adaptations of intonation patterns to the lexical tones when the identities of the tones are jeopardized (Karlsson, House & Svantesson 2012).

Mandarin interjections: a case of spurious tonal identification

The treatment of the interjection /a/ (transcribed as 啊 in Chinese writing) in a learner’s dictionary of Standard Mandarin offers a clear case of spurious tonal identification. This dictionary treats the interjection as if it had lexical tone, and sets up four distinct entries for it, corresponding to the four tones of Standard Mandarin: with tone 1, the interjection would mean “speaker gets to know something pleasant”; with tone 2, it would signal a “call for repetition”; with tone 3, “surprise or disbelief”; and with tone 4, the “sudden realization of something” (Huangfu Qinglian 1994, entry “a”).

This categorization is based on phonetic similarities between the pitch patterns of the four tones and intonational variants of the interjection, as recapitulated in Table 3.

Table 3. Phonetic basis for the four-way categorization of the nuances expressed by the interjection /a/ in Mandarin, as proposed in some dictionaries

tone	characterization in dictionary	example	translation of example	F0 on interjection	canonical realization of tone
1	“speaker gets to know something pleasant”	啊！我考过了！ ā ! wǒ kǎo guò-le !	Wow! I passed the exam!	overall high F0	level, in the upper part of the speaker’s range
2	“call for repetition”	啊，是吗？ á, shì ma?	Oh, is that right?	rising	rising
3	“surprise or disbelief”	啊？你在这儿干吗？ ā? nǐ zài zhèr gānmá?	Huh? What are you doing here?	falling-rising	falling from mid-low to lowest, with final rise in isolation
4	“sudden realization of something”	啊，现在我知道 了。 à, xiànzài wǒ zhīdào-le.	Aha! Now I understand.	falling	sharply falling, from high starting point

There is in fact a considerable phonetic difference between the four-way division of the Mandarin tonal space, on the one hand, and the intonational gradations in the realization of interjections, on the other – involving not only F0, but also length and other parameters. Interestingly, the authors of the dictionary gloss the “tone-4” realization of the interjection /a/ as the “*sudden* realization of something” (emphasis added). The interjection /a/ can just as well convey the realization of something, without any specific hint of suddenness (Lin Yutang 1972, entry “啊”). The F0 of the interjection decreases gradually, in a manner that does not resemble tone 4 (an abruptly falling tone). The mention of suddenness was added because the intonational signalling of this extra nuance tends to shorten the interjection, thereby creating a surface similarity with tone 4. From the point of view of linguistic functions, there should be no confusion: the phonetic realization

of interjections in Standard Mandarin is purely intonational, “with varying, indeterminate accent, like English *Oh! ah! aha!*” (Lin Yutang 1972, entry “啊”). Mandarin interjections bypass tonal coding; the interjection /a/ has a wide range of possible realizations, and of expressive effects. The four entries set up for this interjection in the dictionary single out four of these realizations, and grant them separate status merely because they happen to be phonetically close to the language’s four lexical tones. This example illustrates the potential for a misinterpretation of intonational phenomena as tonal.

2.6.3. *Conclusion about the presence or absence of intonational tones as a typological parameter*

In light of the above survey, it appears that the presence or absence of intonational tones is a typological parameter: a parameter that varies from language to language.

The issue whether a language has tonal intonation or not may appear as a complete non-issue to researchers who use autosegmental-metrical models, since these models operate with the same concepts – among which tone plays a key role – for all languages, as a matter of definition. Viewed in this light, it may seem as if the issue whether a given language has intonational tones or not were simply an issue of terminology. There often exist straightforward equivalences between observations couched in tonal and non-tonal terms. For instance, in their description of phrasing in French, Fougeron and Jun (1998:49–51) explain that they use notations as H* tone and H% tone (or L% tone) respectively as equivalents for Delattre’s (1966) *minor continuation* and *major continuation*.

Such equivalences allow for converting from one framework to another – but only from a language-internal point of view: when it comes to typology, this use of the same labels with widely different meanings for different languages creates difficulties. Upon close examination, it appears that the label H% as used for, say, Kinande, Vietnamese, and French refers to fairly different phenomena. In Kinande, the H% which marks the end of a phrase is a *bona fide* tone, which interacts with tones of lexical origin, e.g. causing neutralization of certain lexical tone oppositions on nouns when they are said in isolation (Hyman 2010:207). In French, in the absence of tones at the lexical level (and at the morphological level) there is no language-internal evidence to decide whether the phenomenon at issue is tonal or not, so H% can be considered as equivalent with *major continuation*,

with added information on phonetic realization. For Vietnamese, H% is used for “rising final pitch movements” by Ha and Grice (2010); like in French, this choice of label is based on theory-internal motivations, not on structural similarities between the lexical tones of Vietnamese and the phenomenon labelled as H%. The adoption of the same label, H%, may appear economical from the point of view of a universal model, in the same way as resorting to the feature /ATR/ (Advanced Tongue Root) to describe the four-way opposition in a vowel system containing /i-e-ε-a/ obviates the need for a multi-valued /open/ feature for vowels, considered uneconomical under certain phonological analyses. The pinch comes when typological considerations come in: should French, and other Romance languages (Calabrese 2000), be included in cross-linguistic studies of ATR? A common-sense answer is that it would seem best to begin by identifying a core set of languages that uncontroversially possess ATR systems – a crucial phonological test being the presence of ATR vowel harmony –, and to apply due caution when considering extensions of the concept beyond this core domain.

To return to intonation, the generalized use of boundary-tone labels such as H% and L% arguably veils typological differences (Ladd 2008). In most East and Southeast Asian languages, the available literature suggests that intonation does not seem to be implemented by the addition of tones in the way described for Kinande, Hausa, or Luganda and Naxi (§3.1). The widely-studied case of Standard Mandarin provides an example. Mandarin has salient intonational phenomena, which have a strong influence on the phonetic realization of tones, to the extent of making the automatic recognition of tone in continuous speech a great challenge. But these intonational phenomena do not affect the phonological identity of the lexical tones. Instead, intonation is superimposed on tone sequences. From the point of view of linguistic structure, intonation remains on an altogether different plane from tones: it does not modify the phonological sequence of tones, even in cases where it exerts a considerable influence on their phonetic realization. This has been studied since the pioneering work of Chao Yuen-ren (1929). Relevant evidence on this issue comes from the field of speech synthesis: some specialists choose to specify (i) full templates of the time course of F_0 for each lexical tone, and (ii) a “strength coefficient” for each syllable (Kochanski, Shih Chin & Jing Hongyan 2003; Kochanski & Shih Chin 2003). The strength coefficient, which correlates with informational prominence, plays a major role in the final shape of the synthesized F_0 curve. This synthesis system provides indirect confirmation for the observation

that, although intonational parameters interact with the phonetic realization of tone, they do not modify the underlying phonological sequence of tones: there is no insertion or deletion of tones. The informational prominence of a syllable is indicated by local phenomena of curve expansion and lengthening on the target syllable, as well as some modifications in supraglottal articulation; conversely, a degree of phonetic reduction is found on other syllables, including a degree of post-focus compression of F0 range (see in particular Xu Yi 1999).

Concerning possible relationships between tone systems and intonation systems, it seems intuitively clear that multilevel tone systems (e.g. Ngamambo, Wobe) cannot allow the type of intonational flexibility in the realization of tone which is pervasive in Mandarin or Vietnamese, because such flexibility would jeopardize the identification of the utterance's underlying tonal string. All other things being equal, it would seem that level tones constrain intonation to a greater extent than complex tones. The typological hypothesis could be phrased as follows: prosodic systems based on discrete pitch levels allow less allotonic variation, so that less information about phrasing and prominence can be encoded as modulations of F0 superimposed on the tonal string. This would create a pressure towards privileging other means to convey phrasing and prominence: either by integration into the tonal string (i.e., *intonational tones* as defined here), or by the use of nonintonational means, such as the use of topic/focus morphemes to convey information structure. Experimental verification of such hypotheses is greatly complicated by the multifarious differences between the languages to be compared, however, including the effects of areal convergence between languages without different tone systems.

Notes

- [illegible]

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Chapter 12

Yongning Na tones in a dynamic-synchronic perspective

The synchronic description proposed in the present volume provides a basis for studying the historical dynamics of tone in Na: a dynamic approach to synchrony brings out patterns of synchronic variation which, in turn, offer some glimpses into the evolution of the tone system. The present chapter brings together observations on this topic.

1. Internal factors of evolution of the tone system

1.1. Disyllabification

As mentioned at the outset of Chapter xyz(Compounds), many roots that used to be phonologically distinct have become homophonous in Na, as in other Sino-Tibetan languages that have undergone considerable phonological erosion (such as Tujia, Bai, Namuyi, or Shixing). As a consequence, there exists a strong tendency towards disyllabification. Supposing that each tonal combination of two monosyllables creates in a different tonal category for the resulting disyllable, this could multiply the number of tones by squaring: 6 tones on monosyllables could yield 36 tones on disyllables. The observed number of tone categories for disyllabic nouns is much smaller (11 tonal classes); the study of the relationship between the tones of monosyllables and those of disyllables holds promise for an understanding of the dynamics of the tone system.

1.1.1. A dynamic analysis of compound nouns

The analysis of compound nouns in Chapter xyz aimed to bring out the relationship between input nouns and the resulting compound. The notation chosen for their tones emphasized their internal makeup. For instance, the combination of a #H-tone determiner and a LM-tone head yields a M.H surface-phonological tone pattern (e.g. /zɣæɫ-yuɿ/ ‘horse’s skin’, from

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/zɥæɭ/ ‘horse’ and /ɥuɭɥ/ ‘skin’); in terms of processes leading from the input tones to the tone of the compound, this can be interpreted as follows: the lexical tone of the determiner, being a floating H tone (never expressed on the lexical item itself, only on a following syllable), associates to the second syllable of the compound. In the shorthand notation used here, this is to be transcribed as #H°: a floating H tone associating to the first part of the compound. The assignment of surface tones then takes place according to the general rules governing the association of tone #H in Yongning Na. Since there is a following syllable within the tone group to host it (namely, the second syllable of the compound), the H tone attaches there; and the first syllable of the compound receives M by default. The notation used for this combination in Table xyz12 of Chapter xyz is #H°, using the symbol ° to stand for the last syllable of the first part of the compound. This notation, while it is fairly complex, appeared adequate insofar as it reflects a hypothesis about the way in which the tone pattern of the compound obtains. Such notations will be referred to below as ‘source-oriented’.

In terms of end result, on the other hand, the resulting compound belongs in tone category H#: it carries a final H tone, which does not move. Compounds made up of the combination of a #H-tone determiner and a LM-tone head therefore feed into the lexical category of H# disyllables. Notation as H# will be referred below as ‘result-oriented’.

Likewise, the source-oriented notation °L is strictly equivalent with the result-oriented notation L#: assigning a L tone after the juncture between the two parts of the compound yields the same result as assigning a final L tone to the entire expression. Table 1 provides a summary.

Table 1. Source-oriented and result-oriented notations of the tones of compounds: three examples.

input tones	surface-phonological tone	phonological analysis	
		source-oriented	result-oriented
#H and LM	M.H	#H°	H#
M and LM	M.L	°L	L#
M and L	M.L	°L	L#

The table presenting the tone patterns of disyllabic compounds (Table xyz of Chapter xyz) is rewritten below as Table 2, adopting a result-oriented notation, without any reference to the juncture between the two parts of the compound (transcribed by means of the symbol ° in Table xyz). Each line corresponds to one tonal category of determiners, and each column to one tonal category of heads.

Table 2. *The tones of disyllabic compounds, adopting a result-oriented notation. The four combinations for which a different notation is used in Table xyz are set in italics.*

tone	LH; LM	M	L	#H	MH#
	L+M	M+L	L+LH	M+H	M+H
LM	LH	LM	LH	LM+#H	LM+MH#
LH	LH	L	LH	LM+#H	LM+MH#
M	<i>L#</i>	#H	<i>L#</i>	#H	MH#
L	L				
#H	<i>H#</i>	#H			<i>L#</i>
MH	H#			H\$	

Note that the same treatment cannot be extended to compounds of more than two syllables: it is not possible to describe the tone patterns of these compounds without referring to the juncture between the two input nouns (except by changing the entire notation, for instance specifying the tone of each syllable).

All of the tone categories observed on disyllabic nouns in Yongning Na are found in Table 2, except M. This reveals that the synchronically productive tone rules that apply in compounds feed into all of the tone categories of disyllables, apart from M.

1.1.2. Possible origins for disyllables, on the basis of their tone: a bird's-eye view

Table 3 provides an overview of possible origins of disyllabic items, in view of currently productive tone rules. The indication ‘–’ means that no example was found, and the mention ‘dubious’ means that there exists isolated examples whose analysis is problematic, e.g., among affixed forms, /tɕuɿmiɿ/ ‘Hwamei’ (a kind of bird) and /tseɿmiɿ/ ‘lighter’, which do not correspond to any of the well-attested correspondences.

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Table 3. Possible origins of disyllabic items, in view of currently productive tone rules.

tone	compounding	suffixation	prefixation
M	–	yes	yes
#H	yes	yes	–
MH#	yes	–	yes
H\$	yes	yes	yes
L	yes	yes	yes
L#	yes	–	yes
LM+MH#	yes	–	–
LM+#H	yes	yes	–
LM	yes	yes	–
LH	yes	yes	–
H#	yes	dubious	–

This bird’s-eye view can provide a hint for the analysis of a disyllabic word whose etymology is unclear.

1.1.3. *Recovering the tones of nouns on the basis of compounds*

The tones of compounds can shed indirect light on the tone of their constituting elements. For instance, ‘elder sibling (brother or sister)’ is commonly realized as /əɬmvɿ/ (tone: L#), but it has a variant with tone MH#: /əɬmvɿɿ/. The tone of the coordinative compounds /əɬmvɿ-giɿzuɿ/ ‘brothers’ (made up of ‘elder sibling’+ ‘younger brother’) is the one expected for an input MH# tone, not an input L# tone. Knowledge of the tone rules in compounds leads to the conclusion that it is the MH# variant that went into the creation of the compound. This fact, together with its rarity in present-day speech, where /əɬmvɿ/ is far more common, suggests that /əɬmvɿɿ/ is not a recent innovation but a form which is currently losing ground to /əɬmvɿ/.

Needless to say, the greatest care must be exercised when attempting to recover tones in this way, since different tone rules may have applied at different stages of the language’s tonal history.

2. A second internal factor of evolution: analogy¹

2.1. General principles

Analogy is the process whereby word forms perceived as irregular are re-shaped so as to conform with common forms. From a morphological point of view, analogy can thus be viewed as a process of regularization. From the point of view of phonetic change, on the other hand, the piecemeal changes introduced by analogy tend to obfuscate regular correspondences.

Detailed case studies of analogical reanalysis reveal the complexity of individual situations. For instance, in the Cameroonian Bantu language Eton the stem of the possessive adjective ‘my’ ends in /ɔ/ in the forms of class 1 and 3: /-amɔ/, and in /a/ elsewhere: /-ama/. This irregularity is due to a mechanism of analogical morphophonological reanalysis that changed the original /a/ of the class 1/3 forms to /ɔ/. There exists a [ɔ] morphoneme whose morphologically-conditioned phonological realizations include /wa/; commonly occurring sequences of w+a, although separated by a morpheme boundary, were reinterpreted in Eton as realizations of this morphoneme (Van De Velde 2008). In this example, morphophonological analogy disregards morphological boundaries; this is not the least of the paradoxes of analogy, which has the potential to create morphophonological alternations (Blevins and Garrett 2009), as well as to inhibit phonetic change in some contexts (Blevins and Wedel 2009).

2.2. Application to Yongning Na

It appears highly plausible that the tantalizingly similar, but not identical tonal paradigms of classifiers – H1 and H2, M1 and M2, MH1 and MH2, L1, L2 and L3: see Chapter xyz – have undergone a degree of analogical levelling, without becoming fully identical. The existence of variants for some combinations, and the occasional hesitations and confusions (errors) during elicitation sessions, all point to the presence of contradictory pressures of the tendency towards analogical simplification, on the one hand, and of the tendency to maintain the distinct identity of the different classes, on the other. The same can be said of the tonal behaviour of affixes and clitics.

This is a field where the description of a single language variety reaches its limits, and a variationist approach would be called for. This study could

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be based on the closest language varieties, spoken within the plain of Yongning or in its close vicinity.

3. The tones of loanwords

Loanwords present a great diversity of situations: they are borrowed from different languages, at different points in history. The present section brings together some simple observations.

3.1. Tibetan loanwords

For want of proficiency in Tibetan, I am not in a position of conducting an in-depth study of Tibetan loanwords; this section only mentions some conspicuous loanwords, pointed out to me by Guillaume Jacques and Katia Chirkova.

3.1.1. *Given names*

Given names in Yongning are of Tibetan origin; they are chosen by monks at the monastery on the basis of the child's date and time of birth, or given by elder members of the family. Table 4 presents the names that were collected as of 2012.

Table 4. Given names in use in Yongning.

tone	examples	www Written Tib (to be added)
M	gvɪmaɪ jiɪtɕiɪ noɪnoɪ piɪmaɪ tʃæɪʃuɪ	
#H	kiɪzo#ɪ kɣɪzo#ɪ tʃaɪtsʰo#ɪ naɪdʒi#ɪ pʰiɪtsʰo#ɪ tɕʰiɪdʒv#ɪ tsʰiɪti#ɪ tsʰuɪ.tɕɪ	
MH#	—	
H\$	tʃaɪmvɪ\$	
L	—	
L#	—	
LM+MH#	pæɪpʰæɪɪ	
LM+#H	dʒuɪma#ɪ dzɣɪtsʰi#ɪ ɲiɪma#ɪ ɬɪtʃʰe#ɪ taɪdzɣɪ#ɪ tʃæɪtʃv#ɪ	
LM	dʒuɪdʒuɪ noɪbvɪ pvɪtʰuɪ	
LH	—	
H#	jiɪʃuɪ tiɪdʒoɪ	

All of these names fall into one of six tone categories: by decreasing number of tokens, #H (8), LM+#H (6), M (5), LM (3), H# (2), and H\$ (1).

3.1.2. Other borrowings

Table 5 shows Tibetan borrowings, apart from from given names of people.

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Table 5. *Tibetan borrowings in Yongning Na.*

tone	examples	meaning	www Tib	meaning in Tib
M	ʈaʈsaʈ	Lhasa (city)		
M	laʈmaʈ	Lama (monk)		
M	tsaʈbɣʈ	powder; flour		
#H	tsʰoʈpæ#ʈ	head of caravan	tshong-pa	merchant
#H	seʈgi#ʈ	local reinterpretation of the name given by Tibetans to the mountain /kɣʈmvʈʈ/		
#H	koʈdæ#ʈ	statue of Buddha	sku-vdra (sku-'dra)	statue
#H	pvʈɬ#ʈ	Tibetan wool fabric, pulu	ww	
MH#				
H\$				
L				
L#				
LM+MH#				
LM+#H	æʈi#ʈ	soul	bla (early form: brla)	
LM	dæʈmiʈ	name of the Yongning monastery	dgra med	
LM	tʰaʈloʈ	name given to the Yongning plain by Tibetans	thar lam	path to liberation
LH				
H#	ʈoʈpvʈ	kow-tow	? à voir	

3.2. Chinese loanwords

3.2.1. Early Chinese loanwords

www to be added

3.2.2. Recent Chinese loanwords

Recent Chinese loanwords contravene some of the phonotactic rules of Na. For instance, the gap-filler *jiùshi* 就是, ‘quite right; exactly, precisely, just’ is borrowed as /tɕo˧˥ɿʂu˨˩˦/, with a word-internal MH contour. Note, however, that contours exist tone-group-internally, initially due to a process of emphasis which has now become standardly associated with some morphemes (see §xyz of Chapter xyz). This may have paved the ground for borrowing Chinese words that have a rising contour on a non-final syllable.

3.3. Pumi (Prinmi) loanwords

The situation in Yongning before the mid-20th century was one in which Na was the dominant language: Pumi people were bilingual in Na, whereas the Na did not necessarily know any Pumi. Yet the possibility of Pumi loanwords should not be lightly dismissed. It seems well established that the feudal lord installed in Yongning by the Mongol leaders at the outset of the Yuan dynasty was of the Pumi (Prinmi) ethnic group (Shih 2010, 45–51). The Pumi and the Na have coexisted peacefully in recent times, and developed a sense of community and kinship; conversations with people from Yongning suggest that the Na of Yongning feel closer to the Pumi from Yongning than to the Naxi. While these historical facts do not relate to language in any straightforward way, they point to Pumi as a potential donor language of loanwords.

(to be developed www)

4. The influence of Chinese on the tone system of Yongning Na

4.1. The social position of Chinese

Early Chinese loanwords were examined in §xyz. They were borrowed under social settings that differ widely from those observed at the time of

fieldwork. Chinese is a late comer to this area. The feudal lord of Yongning spoke Na, and the Na language had a dominant situation in the plain of Yongning up until the mid-20th century. There were few (Han) Chinese migrants to Yongning, and they learnt Na, which was the locally dominant language, used in the Yongning marketplace by native speakers of other languages, such as Pumi (Prinmi), Lisu, and Nosu (Nuosu/Yi). While there can be no doubt that the Na language received various influences in the course of its development, bilingualism was not widespread: speakers of other languages were bilingual in Na, rather than the other way round. Numerous Na speakers had very little command of other languages, or none at all.

This is a somewhat exceptional situation in this area, at the border between Sichuan and Yunnan: for instance, the small community of Na speakers in the neighboring county of Muli (Shuiluo township) are bilingual in Shixing and have some command of Tibetan; and the variety of Na/Naxi spoken in Guabie has long been influenced by other languages, in particular Pumi and Nosu.

While Yongning still preserves the role of a meeting-place and market place in the eyes of inhabitants of neighbouring mountain villages, for instance for the Yi and Pumi/Prinmi people from small villages around Yongning (Wellens 2006, 85), language shift from Na to Chinese is now under way in Yongning.² Instead of limiting the study to Chinese loanwords, one could easily extend it into a full-fledged study of the Chinese language as spoken by Na language consultants, since all of the Na now have some command of Chinese. In the present state of Yongning Na, while elders do regret the fact that their language falls into gradual disuse, they rank proficiency in Chinese – one of the keys to success in society – far above proficiency in Na, and the attitude observed is one of great toleration, whereby phenomena of blending between Na and Chinese were not stigmatized. This attitude facilitates the acceptance of language change: while a pool of variation is present at every moment and for any language, linguistic change in the strict sense requires the acceptance of innovative, deviant forms by the community of speakers.

4.2. Consequences for the tone system

The account of Na tone presented in Chapters xyz-xyz makes it clear how widely this system differs from that of the Chinese dialects to which speakers of Na are exposed (Southwestern Mandarin and Standard Mandarin).

Tones in Na are phonetically simple, consisting of three levels and their combinations, whereas tones in Chinese are phonetically complex (for a review of the facts on the complex tones of East/Southeast Asian languages, see Michaud 2012). The tone system of Yongning Na includes some oppositions that are neutralized when a word is said in isolation: a Yongning Na monosyllable that carries a Mid tone when it is said in isolation may have one of three underlying tones, M, L, or #H.

When they learn Mandarin Chinese, Na speakers come to terms with a differently structured tone system: one in which (leaving aside marginal phenomena of toneless syllables and tone sandhi) each syllable has its own tone, which surfaces as such in isolation. The discrepancy between the underlying forms and the surface forms of Yongning Na tones makes them relatively difficult to handle for less proficient speakers: bilingual speakers who have more exposure to Chinese than to Na.

4.2.1. The loss of tone categories not reflected in surface forms in isolation

Among the less proficient speakers, there is a tendency to overlook the differences that are neutralized in isolation. The surface tone pattern of a word is reinterpreted as its underlying pattern, leading to a major transformation of the architecture of the tonal system. For instance, the family name of the main language consultant is pronounced [la-t^ha-mi]. If the surface pattern, M.M.H, is taken at face value, the derivation of the collective form ('the Latami clan, the Latami family'), by addition of the suffix /=ɿ/, should lead to the assignment of a L tone on the collective suffix: [*la-t^ha-miɿ=ɿ], a tone pattern which is actually attested in the speech of one of the bilingual speakers. However, the correct (conservative) tone pattern is [la-t^ha-miɿ=ɿ]: it reveals that the final H tone in the name [la-t^ha-mi] is in fact phonologically specified as attaching to the last syllable of the phonological word: /la-t^ha-miɿ/. Under the reinterpretation made by less proficient speakers, it becomes /la-t^ha-miɿ#/, with H tone at the end of the lexical word.

An especially difficult opposition to learn is that between the LM and LH patterns over disyllables, because it only surfaces when the word is followed by a toneless clitic. For instance, [boɿmiɿ] 'sow, female pig' and [boɿɬaɿ] 'boar, male pig' have the same tones not only in isolation but also when followed by the copula; the few contexts that can disambiguate their tone pattern are exemplified by [boɿmiɿ-bvɿ] '...of (a) sow' vs. [boɿɬaɿ-bvɿ]

‘...of (a) boar’, where the H part of the lexical LH pattern results in the lowering of the following possessive particle, to L.

Under such circumstances, it does not come as a surprise that the opposition between LM and LH should be lost by some speakers, such as F5 (aged 35, proficient in both Na and Chinese). In her speech, the tones of ‘sow’ and ‘boar’ are strictly identical: LM and LH have merged to LM.

4.2.2. *The simplification of morphosyntactic tone rules*

Examining the tables in Chapters xyz and xyz, the complexity of Na tonal morphosyntax may look staggering. These combinations are not all that difficult to memorize and apply so long as one practises the language very regularly: the rules are productive, and the syntactic structures at issue (subject+verb, object+verb, compound nouns...) are so frequent that they are not particularly difficult to memorize if one is steeped in a Na linguistic environment. On the other hand, from the point of view of a speaker with limited fluency, these combinations may prove problematic.

Evidence about ongoing language change can be gathered from deviant patterns, which to the linguist are harbingers of language change. They include a range of phenomena, from occasional slips of the tongue on the part of proficient speakers to ingrained habits of other speakers.

Examples of hesitations and of simplified patterns can be found in the speech of M23, a bilingual language consultant. In subject+verb and object+verb combinations as well as in compounds, tone L, which is realized as [M] in isolation, tends to be neutralized with tone M: consultant M23 realizes ‘the sheep arrived’ as /jo-ɬ ts^huɬ-zeɬ/, i.e. in his speech this is not simply a variant condemned as a slip of the tongue, as in F4’s speech, but it has become the norm. Likewise, he realizes the combination ‘sheep’s muzzle’, made of /joɬ/ ‘sheep’ and /niɬgɣɬ/ ‘nose, muzzle’, as /joɬ-niɬgɣɬ/, i.e. a simple concatenation of the two nouns, unlike the conservative pattern found in F4’s speech: /joɬ-niɬgɣɬ/. In this conservative form, the tone of the compound is phonologically identical with the lexical L tone of the determiner of the compound, /joɬ/ ‘sheep’. This yields /joɬ-niɬgɣɬ/, ‘sheep’s muzzle’, realized phonetically as [joɬ-niɬgɣɬ] following the post-lexical addition of a final H tone (due to Rule xyz: all-L tone groups are not allowed in Na).

A speaker needs a good command of the grammar of Na to implement the conservative tone pattern in this compound, which thoroughly modifies the surface forms: the L tone of ‘sheep’, which does not even surface in

isolation, has the effect of imposing itself onto no less than three syllables in succession in the compound, wiping out the lexical tone of the head of the compound in the process (from [ni˥lgɿ˥] in citation form to [ni˥lgɿ˥] in this compound). Such a process is unheard of in Mandarin Chinese; in light of this discrepancy, it is understandable that some less proficient speakers who are exposed to Chinese on a day-to-day basis should come to have hesitations, and should (occasionally or regularly) go for a simple succession of the tones as they appear in isolation, as is the case in their second language (Mandarin Chinese), instead of applying the complex rules of Yongning Na tonal grammar.

These examples illustrate the complexity of phenomena of language variation and change, which can constitute a simplification from one point of view and a complexification from other points of view. Saying /jo˥ | tsʰu˥l-zɛ˥/ for ‘the sheep arrived’ is a simplification insofar as the subject bears the same tone as in isolation. It is a complexification insofar as it increases the frequency of occurrence of contexts in which the lexical L tone of ‘sheep’ does not surface, making it more difficult for language learners to arrive at the identity of this word’s lexical tone.

4.2.3. The straightening out of irregular tone patterns

In addition to losing some tone categories, less proficient speakers tend to regularize irregular patterns, for want of having memorized the exceptions. For instance, the word for ‘powder, flour’ is /tsa˥bɿ˥/, with M tone. According to the rules that govern the tone pattern of compound nouns, the combination of this word with /lv˥mi˥/, ‘stone’, should yield a simple M-tone output, /lv˥mi˥-tsa˥bɿ˥/. (The compound means ‘fine sand’.) This is a simple rule: in this case underlying tones and surface tones are identical. This rule is therefore applied productively even by the speakers with a less than full command of Yongning Na. However, the older generation of speakers have a different tone pattern for these words: compounds involving /tsa˥bɿ˥/, ‘powder, flour’, are irregular – a fact that may well be related to the fact that this is a Tibetan loanword. They carry a L tone on that morpheme, witness /lv˥mi˥-tsa˥bɿ˥/ ‘fine sand’, /qʰa˥dze˥-tsa˥bɿ˥/ ‘sweetcorn flour’, /dze˥[u˥]-tsa˥bɿ˥/ ‘wheat flour’, all with a M.M.L.L tone pattern (phonological notation: °L), instead of the expected M.M.M.M (phonological notation: M). (Note that /lv˥mi˥/ ‘stone’, /qʰa˥dze˥/ ‘sweetcorn’ and /dze˥[u˥]/ ‘wheat’ all have a lexical M tone.)

4.2.4. *Cases where MH tone fails to split into two levels: hint of a potential for evolution towards a syllable-tone system?*

Naxi, a close relative of Yongning Na, has few phenomena of tone change. In the A-sher dialect, the reduction of a morpheme carrying H tone results in reassociation of this tone to the syllable to its left (Michaud 2006; Michaud and He Xueguang 2007); informal observations and exchanges with Naxi speakers living in the city of Lijiang suggest that even these simple instances of tone change are fast disappearing from Lijiang Naxi. For instance, the conditional/topic is /ɿ seɿ/ in A-sher: the syllable /seɿ/ is preceded by a floating H tone, presumably the historical product of the reduction of disyllabic /ɿuɿ-seɿ/. In Lijiang, this morpheme has simplified to /seɿ/ (wwwquotedictionarybyTPinson, when it gets published). It is not at all unlikely that increasing familiarity with Chinese is exerting an influence on Naxi, leading to the reinterpretation of its tones as units attached to the syllable, rather than levels that can combine among themselves.

Of the four tones of Naxi, H, M, L and Rising, the latter appears especially revealing in this respect. It is clearly a Naxi innovation, on the basis of an earlier three-tone system (H, M, L). The following historical scenario can be proposed. Rising contours appeared in the language through processes of syllable reduction, and became lexicalized on some words. This paved the way for the assignment of a /LH/ tone sequence to Chinese words with rising tone. At that point, Chinese borrowings consolidated this marginal lexical tone category by giving it considerable lexical development. Increasing bilingualism with Chinese gradually tilted the perception of Naxi tones towards the syllable-tone type, to the point that it is now an issue whether the rising tone of Naxi is to be analyzed as a combination of levels (L+H, or M+H) or as a phonological unit.

In Yongning Na, there is plentiful evidence that contours are to be analyzed as sequences of levels. There are nonetheless some weak hints of a tendency for MH contours to be treated as units associated to one syllable. When saying MH-tone monosyllabic nouns in the frame ‘This is...’, /t͡ɕʰuɿ __ ɲi/, consultant F4 occasionally produced *M.MH.L or *M.MH.H variants, instead of M.M.MH (e.g. /*t͡ɕʰuɿ | t͡ɕʰuɿɿ ɲi/ or /*t͡ɕʰuɿ | t͡ɕʰuɿɿ ɲi/, instead of /t͡ɕʰuɿ | t͡ɕʰuɿ ɲi/, for ‘This is a sheep’). When her attention was drawn to these discrepancies, she said: /ɬuɿ-bæɿ-lɑɿ ɲi/, ‘It’s just the same’. Intonationally, realization of the MH contour on the syllable to which it is lexically attached tends to happen when the word is emphasized; the realization of a noun within a carrier sentence is clearly a case in point.

This tendency surfaces here and there in the recordings. An example is found on item 7 of the ‘Tone: Even’ recording, where /t͡ɕʰæɪ-pɣɿto/ ‘even a deer’ is realized phonetically close to [t͡ɕʰæɪɿ-pɣɿto], with (i) a H tone on [pɣɿ], due to reassociation of the H part of the MH contour of /t͡ɕʰæɪ/ ‘deer’, as expected; and (ii) a MH contour on [t͡ɕʰæɪɿ], due to incomplete de-association of the H part of its phonological MH contour.

This is only a weak tendency; it does by no means warrant the conclusion that Yongning Na is on its way towards adopting a syllable-tone system. A detailed cross-linguistic phonetic study would be necessary to determine to which extent such tendencies are present among the world’s level-tone systems. Such a study might reveal that Yongning Na is not at all exceptional in this respect. The computation of tone sequences is not a mechanical process, and slight slips of the tongue whereby a H tone does not fully de-associate from the syllable to which it is lexically attached may not come as a surprise to linguists with an experience of level-tone systems. This synchronic tendency appeared well worth mentioning, however, in relation to the influence currently exerted by Chinese.

Laurent Danon-Boileau advised his students to study lesser-documented languages – a field about which I knew nothing. I realized at once that this was what I wanted to do: to apply myself to the documentation of a lesser-known language. In 1994, reading Michel Launey’s newly published description of Classical Nahuatl as “an omnipredicative grammar” (Launey 1994), my imagination was fired by the mention of the professional and personal coincidences (“hasards personnels et professionnels”, p. 16) that had led him to study a language so remote in time and space, ultimately leading to groundbreaking insights into human language. I dreamt of making a scientific contribution – however small – by exploring a distant language and culture. I finally experienced this wonderful blend of discovery, excitement and fulfilment in my fieldwork in Southwest China. For this, I am very grateful to the Yongning Na language consultants, in particular my main consultant /la-tʰa-miːl̩| t̪æ-t̪ʃwɪ-l-laɪmv/ (拉他咪•达石拉么), thanks to whom my work was a constant pleasure.

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