The suprasegmental signaling of attitude in German and Chinese: A phonetically oriented contribution to intercultural communication

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Appendix I

Complementary data relating to Chapter 6

1 The pin-yin system

The following is a presentation of the symbols of the *pin-yin* system used in the representation of Mandarin Chinese consonants, vowels and the vowel-like sounds created by the processes of *palatalization* and *labialization*[1]. While the main emphasis of this discussion will be on the definition of the *pin-yin* symbols in terms of their correlates in the International Phonetic Alphabet (IPA), a brief account of the phonological status of the discussed sound units will be included at the end[2].

1.1 The consonantal symbols[3]

Mandarin Chinese distinguishes between 23 consonantal initials[4] and two finals, the alveolar and velar nasals [n] and [ŋ].With respect to place of articulation the initials may be divided into *labials*, *alveolars*, *dental sibilants*, *retroflexes*, *palatals* and *velars*[5], and there are five manners of articulation: *unaspirated stops*, *aspirated stops*, *fricatives*, *voiced continuants* and *nasals*. While the majority of these sounds are represented with one *pin-yin* symbol, in four cases combinations of two symbols are used: /zh/, /ch/, /sh/ and /ng/.

	Unaspirated stops	Aspirated stops	Fricatives	Voiced continuants[6]	Nasals
Labials	/b/ [b̥]	/p/ [p^{h}]	/f/ [f]	/w/[w]	/m/ [m]
Alveolars	/d/ [d̥]	/t/ [t^{h}]		/l/ [l]	/n/ [n]
Dental sibilants	/z/ [dz]	/c/ [ts^{h}]	/s/ [s]		
Retroflexes	/zh/ [dʒ]	/ch/[tʃ^{h}]	/sh/[ʃ]	/r/ [ɹ]	
Palatals	/j/ [dʑ]	/q/ [tɕ^{h}]	/x/ [ɕ]	/y/ [j]	
Velars	/g/ [g̊]	/k/ [k^{h}]	/h/ [x]		

Table 1 The Mandarin initials (*pin-yin* and IPA)

Alvealar	/n/ [n]
Velar	/ng/ [ŋ]

Table 2 The Mandarin finals (*pin-yin* and IPA)

1.2 The vocalic symbols

In *pin-yin* six vocalic symbols, /a/, /e/, /i/, /u/, /ü/ and /o/, are used to represent monophthongs, diphthongs and the brief, onglide-like[7] vocalic sounds ([i], [u] and [y]) produced in *labialization* and *palatalization.*

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[1] *Labialization* is defined as the addition of lip-rounding or lip protusion to sounds normally articulated with the lips in neutral or spread position. In *palatalization*, the tip and blade of the tongue are raised to a high front position in the anterier part of the hard palate, as in the articulation of [i] (Clark & Yallop 1990: 100). Combinations of non-labial initials and the symbol /u/ are interpretated here in terms of *labialization*, while the symbol /i/ following non-palatal initials is seen as indicating that they are palatalized. Likewise, the /i/ which often follows the palatals /q/, /x/ and /j/ is regarded as part of their (phonemic) representation, indicating that they are articulated with the tongue in the above described position.

[2] Discussions on the phonological status of the sounds be treated here are found in Chao 1968, Norman 1988, Li & Thompson 1989.

[3] Throughout this section, transcriptions in *pin-yin* will be given in the slashed brackets (/ /) used for phonological transcriptions, while IPA symbols will be given between square brackets ([ ]).

[4] Not included here is the so-called *zero initial* of those Mandarin syllables which lack initial consonants, as the /an/ of Xi`an. While the precise phonetic correlate of the zero-initial has not been clarified, informal observations of this writer suggest that it corresponds to a soft, but clearly audible, glottal stop [ʔ]. Norman (1988), however, observes that 'a majority of Peking speakers' realize the *zero initial* as a weak voiced uvular frictive (1988: 140).

[5] The velar initials are referred to as *gutturals* in Chao 1968 and Norman 1988.

[6] Note that /y/ and /w/ are regarded here as consonants, unless they are followed by an /i/ or /u/, respectively. See discussion below.

[7] Onglides and offglides may be broadly defined as brief vocalic sounds leading to, or leading from, the dominant vowel of a syllable (Clark & Yallop 1990: 102)

1.2.1 The monophthongs and diphthongs

The six vocalic symbols are used on their own for various monophthongal sounds, whose precise phonetic correlates depend on their context, in terms of (initial and final) consonantal symbols and the vocalic symbols /i/, /u/ and /y/ used to represent *palatalization* and *labialization*[8]. The symbols /a/, /e/, /i/, /u/ and /o/ may also be combined to represent the diphthongs /ao/, /ai/, /ei/, /ui/ and /ou/[9].

Vocalic *pin-yin* symbol	Context (*pin-yin*)	IPA-correlates (with examples)
/a/	*before* /n/	[æ] e.g. /man/ [mæn] 'slow'
	between /i/[10] and /n/	[ɛ] e.g. /lian/ [l^{j}ɛn] 'face'
	between /y/ *and* /n/	/yan/ [jɛn] 'salt'
	before /ng/ and after all other initials	[a] e.g. /la/ [la] 'spicy'
		/lang/ [laŋ] 'wolf'
/e/	*before* /i/	[e] e.g. /lei/ [lei] 'tired'
	after /i/[9] , /ü/[11] and *after palatals* followed by /u/ or /ü/[12]	[e] e.g. /lie/ [l^{j}e] 'tear'
		/nüe/ [n^{y}e] 'cruel'
		/jue/ [dʑ^{y}e] 'feel'
	before /n/ *and* /ng/	[ə] e.g. /leng/ [ləŋ] 'cold'
	after all other initials	[ə] e.g. /le/ [lə]'merry'
/i/	*after* /c/, /z/, /s/ *and* /ch/	[ɨ] e.g. /zi/ [dzɨ] 'word'
		/chi/ [tʃ^{h}ɨ] 'eat'
	after /x/, /q/ *and* /z/[9]	[i] e.g. /qi/ [tɕ^{h}i] 'seven'
		/ji/ [dʑi] 'chicken'
	before /n/ *and* /ng/[13]	[i] e.g. /ming/ [miŋ] 'name'
	after all other initials	[i] e.g. /bi/ [bi] 'pen'
/u/	*after* /x/, /q/ and /j/	[y] e.g. /qu/ [tɕ^{hy}] 'take'
	after all other initials	[u] e.g. /zhu/ [dʒu] 'pig'
		/lu/ [lu] 'deer'
	after /i/[9]	[əʊ] e.g. /niu/ [n^{j}əʊ] 'ox',
		/qiu/[tɕ^{h}əʊ] 'automn'
/ü/	*only after* /n/ *and* /l/	[y] e.g /lü/ [ly] 'donkey'
/o/	*before* /ng/	[ʊ] e.g. /long/ [lʊŋ] 'dragon'
	after labials[14]	[ɔ^{ə}] e.g. /mo/ [mɔ^{ə}] 'rub'
		/fo/ [fɔ^{ə}] 'Buddha'

Table 3 The single vocalic symbols

[8] In difference to the term environment which is generally used to describe the phonetic environment of a sound, the term *context* is used here to relate to the other symbols found in the immediate vicinity of a *pin-yin* symbol.

[9] These diphthongs differ with respect to the contexts in which they may occur.

[10] In *pin-yin* this /i/ represents *palatalization*.

[11] This symbol /ü/ is only found after /n/ and /l/.

[12] Palatals followed by /u/ are seen here as corresponding to labialized palatals. See discussion below.

[13] The /i/ here is a full vowel, and does not represent *labialization* of the preceding initial.

[14] In fact, the symbol /o/ alone occurs only after labials and *labialization*. The offglide [ə] is not always present in non-standard Mandarin speech.

Vocalic *pin-yin* symbols	Context (*pin-yin*)	IPA-correlates (with examples)
/ao/	*after all initials except palatals*	[aɔ] e.g. /pao/ [paɔ] 'run'
/ai/	*after all initials except palatals*	[aɪ] e.g. /mai/ [maɪ] 'buy'
/ei/	*not after* /i/[9] *or* /t/, /s/, /r/ /h/, /t/, /c/, /ch/, /k/	[eɪ] e.g. /mei/ [meɪ] 'pretty' /zei/ [dzeɪ] 'robber'
/ui/	*after labialized initials* or /r/	[eɪ] e.g. /zhui/ [dʒʷeɪ] 'chase'
/ou/	*not after* /i/[9], *or* /b/ and /w/	[əʊ] e.g. /mou/ [məʊ] 'a certain'

Table 4 The combined vocalic symbols

1.2.2 Labialization and palatalization

With the exception of the *labials* and /r/, all Mandarin initials may be labialized, a process represented by an /u/ following the respective consonant in *pin-yin* and a small raised 'w', i.e. [ʷ], in IPA. Labialized initials may be followed by the vocalic symbols /o/, /i/ and /a/ and by /n/, /an/ and /ang/. *Palatalization*, a phonological feature of the *palatals*, is also found with the *labials* /b/, /p/ and /m/ and the *alveolars.* It is represented in *pin-yin* by an /i/ immediately following the respective consonant and in IPA by a small raised 'i', i.e. [ʲ][15]. Palatal and palatalized initials may be followed by (combinations of) symbols such as /a/, /e/, /u/, /ao/, /an/, /ang/ and /ong/. In the *labialization* of the *palatals* /j/, /q/ and /x/, the quality of the /u/ is not [u] but [y], a phenomenon explainable in terms of the (progressive) assimilation of [u] to [y]. Such assimilatory processes may also be applied to explain the combinations /yuan/ and /yun/, where the quality of the /u/ is also [y][16]. In these cases, the IPA-representation of *labialization* will be a small raised 'y', i.e. [ʸ]. Some of the symbol combinations which can occur with labialized and palatalized initials are indicated below[17].

Labialization

/suo/ [sʷɔˢ]	/sui/ [sʷeɪ]	-	/sun/ [sʷuˢn][18]	/suan/ [sʷæn]	-
/guo/ [gʷɔˢ]	/gui/ [gʷeɪ]	/gua/ [gʷa]	/gun/ [gʷuˢn]	/guan/ [gʷæn]	/guang/ [gʷaŋ]
/luo/ [lʷɔˢ]	-	-	/lun/ [lʷuˢn]	/luan/ [lʷæn]	-
-	-	-	/qun/ [tɕʰʸyn]	/quan/ [tɕʰʸɛn]	-
-	-	-	/xun/ [ɕʸyn]	/xuan/ [ɕʸɛn]	-
-	-	-	/yun/ [jʸyn]	/yuan/ [jʸɛn]	-

Palatalization

-	/tie/ [tʲe]	-	/tiao/ [tʲaɔ]	/ tian/ [tʲɛn]	-	-
/qia/[tɕʰa]	/qie/[tɕʰe]	/qiu/[tɕʰəʊ]	/qiao/[tɕʰaɔ]	/qian/[tɕʰɛn]	/qiang/[tɕʰaŋ]	/qiong/[tɕʰʊŋ]
-	/lie/ [lʲe]	/liu/ [lʲəʊ]	/liao/[lʲaɔ]	/lian/[lʲɛn]	/liang/[lʲaŋ]	-

[15] The (combination of) symbols /i/, /in/ and /ing/ are not included here, as the /i/ does not reflect *palatalization* in these cases. In combinations of palatals with a single following /i/, the latter is regarded as a full vowel, not the representation of palatalization. The same applies to palatals followed by a single /u/, where the /u/ is again a full vowel with the value [y].

[16] Under the effect of *labialisation*, the /i/ in /yin/jin] and /yan/ [jɛn] changes to [y], represented in *pin-yin* as /yun/ and /yuan/. Note that the interpretation of these combinations of sounds/symbols in terms of *labialization* aims only to clarify the phonological status of these sounds in modern Chinese and does not take account of claim of the historical sound-changes which took place in the past.

[17] As these examples show, the indicated (combination of) symbols do not always occur with all labialized or palatalized initials.

[18] An /n/ following labials/*labialization* (not, however, with palatals) has an ongliding [ə].

1.3 The phonological status of the discussed vocalic and consonantal units

Three points must be pointed out with respect to the phonological status of the vocalic and consonantal units represented by the above discussed *pin-yin* symbols[19]. First, regardless of the number of symbols used in their representation, all the initials and finals shown in Tables 1 and 2 and all the vocalic units shown in Tables 3 and 4 count as single phonemes. Second, in the combinations /yi/ and /wu/, pronounced [ʔi] and [ʔu], the *pin-yin* symbols /y/ and /w/ are merely fillers, representing empty consonants, so that such combinations also represent single phonological units[20]. Thirdly, in those cases where the symbols /i/ and /u/ represent *palatalization* and *labialization*, they are to be seen as part of the preceding consonants and do not hold a phonological status of their own.

[19] This issue is of great importance in calculations of speech tempo based on the underlying phonological units, such as those undertaken in Chapter 8. It is also important for phonological representations of Chinese speech, as found throughout Appendix III (See introduction to Appendix III).

[20] As a phenomenon in support of this view, neither /y/ or /w/ are realized as consonants in these positions. Instead, speakers begin such syllables with a *zero-initial*.

2. The speech corpus

The following is a list of the 74 German and Chinese utterances (speech samples) analysed in the sociolinguistic judgement tests and the phonetic microanalyses discussed in Part III. The German, or Chinese, original versions are given first, followed by their free English translations[21]. The Chinese utterances are represented with traditional and simplified characters as well as in *pinyin.*

A The German speech samples[22]

2.1 Speaker Clara

2.1.1 cBlum 4
Original version: *Blumen. Habt ihr vielleicht so Papierblumen?*
Translation: Flowers. Do you by any chance have paper flowers?

2.1.2 cGans 1
Original version: *Die Gans da ist ja toll!*
Translation: Ooh, what a beautiful goose!

2.1.3 cKuli 1
Original version: *Ach, und was ich fast vergessen hätte: Kuliminen brauch(e) ich noch.*
Translation: Oh, I almost forgot: I also need ballpen cartridges.

2.1.4 cZwieb 3
Original version: *Möchten Sie da net[23] vielleicht auch diese Sommerzwiebeln,mit Zwie-, mit Grün?*
Translation: May I recommend you these sommer onions, with on-, with the stems?

2.1.5 cMoon 1
Original version: *Hab(e)n Sie die Moonboots noch in der Kindergröße?*
Translation: Do you have moonboots in childrens' sizes?

2.1.6 cGans 4
Original version: *Und dann hab(e) ich als Nächstes: Gans*
Translation: And then I need a goose.

2.1.7 cMoon 3
Original version: *Da hab(e)n wir schon Moonboots.*
Translation: We already have moonboots.

2.1.8 cBlum 3
Original version: *Bei den Blumen hab(e)n wir hier..m.. Rosen.*
Translation: As for flowers, we..er.. have roses.

2.1.9 cMango 3
Original text: *Ich glaub(e) Mango war noch das andere, ne?*[24]
Translation: I think Mangos was what you wanted next, wasn't it?

2.1.10 cSchoko 3
Original text: *Ja, Schokolade und Sahnebonbons.*
Translation: Yes, chocolate and toffees.

2.1.11 cBlum 1
Original text: *Hm, und ein Strauß Blumen.*
Translation: Mm [yes], and a bunch of flowers.

2.1.12 cKuli 3
Original text: *Ich verkauf(e) Ihn(e)n natürlich gerne diese Kuliminen.*
Translation: Of course I'd be delighted to sell you these ballpen cartridges.

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[21] Free translations were chosen to convey the underlying feeling (in terms of interpersonal attitude) of the utterances.
[22] In the original versions of the German utterances, the speakers' colloquial reductions of verb endings are indicated by placing the reduced vowel, in most cases an 'e' ([ə]) between brackets.
[23] 'Net' is a reduced, colloquial rendering of 'nicht' (*not*).
[24] 'Ne' is another colloquial form for 'nicht', used in this position with the meaning '[am I] right?'

2.1.13 cMango 2
Original text: *Was hab(e)n denn Bananen und Mangos gekostet?*
Translation: What did [the] bananas and mangos cost then?

2.1.14 cMango 1
Original text: *Was kost(e)n denn die Mangos heute? Das würde mich interessieren.*
Translation: How much are the mangos today? I'd really like to know that.

2.1.15 cBlut 4
Original text: *Dann brauch(e) ich noch unbedingt Blutwurst.*
Translation: And then I really need *blutwurst* sausage.

2.1.16 cSchoko 2
Original text: *Ich wollte doch Schokolade für den Kuchen noch.*
Translation: [But] I also wanted chocolate for the cake.

2.1.17 cKuli 2
Original text: *Aber da war doch ein Angebot gewesen für neun Mark zwanzig für die Kuliminen.*
Translation: But there was this special offer of nine Marks twenty for the ballpen cartridges.

2.1.18 cBlut 3
Original text: *Und schau(e)n Sie mal hier die Blutwurst!*
Translation: [Now], you [really must] take a look at the *blutwurst* sausage!

2.1.19 cVani 2
Original text: *Hast du den Vanillinzucker vergessen?*
Translation: Did you forget to buy vanilla sugar?

2.1.20 cZwieb 2
Original text: *Jetzt räum(e)n wir erst mal die Zwiebeln und die Karotten weg.*
Translation: Let's put away the onions and the carrots first.

2.2 Speaker Sybille

2.2.1 sKuli 1
Original text: *Dann bräucht(e) ich noch Kuliminen für meinen Kuli.*
Translation: And then I also need cartridges for my ballpen.

2.2.2 sMango 4
Original text: *Also Mango ist schwierig. Papaya hätt(e) ich da.*
Translation: I'm afraid mangos are a problem. But I do have papayas, if you like.

2.2.3 sMoon 1
Original text: *Gut, dann nehm(e) ich drei Paar Moonboots in Größe sechsunddreißig.*
Translation: Okay, then I'll have three pairs of moonboots in size thirty-six, please.

2.2.4 sKiwi 4
Original text: *Wieviel Kiwis brauchst Du?*
Translation: How many kiwis would you like?

2.2.5 sBlum 3
Original text: *Blumen hab(e) ich im Augenblick nicht da.*
Translation: I don't have any flowers at the moment.

2.2.6 sKuli 4
Original text: *Hm, da sind die Kuliminen.*
Translation: Hm, here are the ballpen cartridges.

2.2.7 sKiwi 3
Original text: *Kiwis hab(e) ich auch da.*
Translation: Yes, I also have kiwis.

2.2.8 sKiwi 1
Original text: *Ja, da hätte ich gerne drei Stück. Drei Kiwis, bitte.*
Translation: Ah yes, then I'll have three please. Three kiwis.

2.2.9 sKiwi2
Original text: *Hm, wieviel Kiwis hast du geholt, sagst du?*
Translation: Hm, how many kiwis did you say you bought?

2.2.10 sMango 3
Original text: *Mangos hab(e) ich im Augenblick nicht. Es ist jetzt nicht die Jahreszeit dafür.*
Translation: I don't have any mangos at the moment. It's the wrong time of the year for mangos.

2.2.11 sSchoko 1
Original text: *Was kostet denn da die...die Tafel Schokolade?*
Translation: How much is.. er..one bar of chocolate?

2.2.12 sGans 1
Original text: *Kann ich dann morgen eine frische Gans hab(e)n?*
Translation: Can I have a fresh goose tomorrow then?

2.2.13 sBlum 1
Original text: *Einen Strauß Blumen brauch(e) ich noch.*
Translation: I also need a bunch of flowers.

2.2.14 sMoon 2
Original text: *War(e)n denn in ihrer Größe Moonboots da?*
Translation: Did they have moonboots in the right size for her?

2.2.15 sBlum 2
Original text: *Und die er..er..Blumen? Hast du Blumen mitgebracht?*
Translation: And the..er..er..flowers? Did you buy the flowers?

2.2.16 sSchoko 3
Original text: *Ja. Welche Schokolade wollt(e)n Sie denn?*
Translation: Sure, what kind of chocolate would you like?

2.2.17 sSchoko 4
Original: *Ja, welche Schokolade soll das denn sein?*
Translation: Oh, er...what chocolate were you thinking of?

B The Chinese speech samples[25]
2.3 Speaker You

2.3.1 yLong 3
Original:

好吧，那我要一公斤龍蝦。

好吧，那我要一公斤龙虾。

Transcription: *Hao ba. Na, wo yao.. yi gong-jin long-xia(!)*
Translation: Okay. Then I'll have...one pound of lobster.

2.3.2 yLu 3
Original:

好，那我要半公斤鹵肉。

好，那我要半公斤卤肉。

Transcription: *Hao. Na, wo yao..ban gong-jin lu-rou(!)*
Translation: Okay. Then I'll have..half a pound of stewed meat.

2.3.3 yLizhi 4
Original:

啊，荔枝現在已經上市了。

啊，荔枝现在已经上市了。

Transcription: *Ah, li-zhi xian-zai yi-jing..shang-shi le(!)*
Translation: Ah yes, lichees are in season right now.

2.3.4 yBing 4
Original:

你要什麼口味的冰淇淋？

你要什么口味的冰淇淋？

[25] An exclamation mark in brackets indicates excitement/ elevated emotional arousal on the part of the speaker.

Transcription: *Ni yao shemma kou-wei de bing-qi-ling?*
Translation: What ice cream flavour do you want then?

2.3.5 yMing 3
Original:
冥紙我需要一份。
冥纸我需要一份。
Transcription: *Ming-zhi, wo xu-yao yi fen(!)*
Translation: I need one pack of paper money.

2.3.6 yMan 3
Original:
好，那我要五個白饅頭。
好，那我要五个白馒头。
Transcription: *Hao. Na, wo yao.. wu ge bai man-tou.*
Translation: Okay. Then I'll have five plain dumplings.

2.3.7 yLing 1
Original:
現在檸檬一公斤是十二馬克。
现在柠檬一公斤是十二马克。
Transcription: *Xian-zai ning-meng yi gong-jin shi shi-er ma-ke(!)*
Translation: Right now one pound of lemons costs twelve Marks.

2.3.8 yLizhi 1
Original:
那，建議您荔枝怎么樣？
那，建议您荔枝怎么样？
Transcription: *Na, jian-yi nin, li-zhi zemma yang?(!)*
Translation: Well then, may I recommend lichees?

2.3.9 yLong 4
Original:
龍蝦有啊，有啊，現在很便宜哦。
龙虾有啊，有啊，现在很便宜哦。
Transcription: *Long-xia, you ah, you ah! Xian-zai hen pian-yi oh(!)*
Translation: Oh yes, of course we have lobster! It's very cheap right now!

2.3.10 yDang 1
Original:
新鮮，新鮮，當然新鮮。現在當季。
新鲜，新鲜，当然新鲜。现在当季。
Transcription: *Xin-xian, xin-xian! Dang-ran xin-xian! Xian-zai dang-ji(!)*
Translation: Oh yes, of course it's fresh! It's in season right now!

2.3.11 yLong 2
Original:
你爲什么要買龍蝦？
你为什么要买龙虾？
Transcription: *Ni wei shemma yao mai long-xia?(!)*
Translation: What did you buy lobster for?
2.3.12 yLizhi 2
Original:
你看一下，對一下，這荔枝多少錢？
你看一下，对一下，这荔枝多少钱？

Transcription: *Ni kan yi xia, dui yi xia: Zhe li-zhi duo-shao-qian(!)*
Translation: Well, take out your receipt and check: How much were these lichees?!

2.3.13 yMan 2
Original:
明天早上要吃的饅頭你有沒有買？
明天早上要吃的馒头你有没有买？
Transcription: *Ming-tian zao-shang yao chi de man-tou, ni you mei you mai?*
Translation: What about the dumplings we were planning to eat tomorrow morning? Did you get them?

2.3.14 yLu 2
Original:
然後，這個鹵肉多少錢？
然后，这个卤肉多少钱？
Transcription: *Ran-hou, zhe-ge lu-rou..., dou-shao-qian?*
Translation: And then, this stewed meat..How much was that then?

2.3.15 yLong 1
Original:
龍蝦一公斤才十二馬克。
龙虾一公斤才十二马克。
Transcription: *Long-xia yi gong-jin cai shi-er ma-ke(!)*
Translation: One pound of lobster only costs twelve Marks!

2.3.16 yLing 2
Original:
你這一個檸檬，這買多少錢一公斤啊？
你这一个柠檬，这买多少钱一公斤啊？
Transcription: *Ni zhe-ge ning-meng. Zher mai duo-shao-qian yi gong-jin ah?(!)*
Translation: What about these lemons? How much were they a pound?

2.3.17 yMan 1
Original:
您不嚐嚐，這邊饅頭滿有名的啊！
您不尝尝，这边馒头满有名的啊！
Transcription: *Nin bu chang-chang? Zhe-bian man-tou man you ming de ah(!)*
Translation: Don't you want to try them? Our dumplings are very famous!

2.3.18 yLa 2
Original:
那辣椒呢？我們今天做菜要辣椒。你有沒有買-買辣椒啊？
那辣椒呢？我们今天做菜要辣椒。你有没有买-买辣椒啊？
Transcription: *Na, la-jiao ne? Wo-men jin-tian zuo cai yao la-jiao(!) Ni you mei you mai .. mai la-jiao ah?(!)*
Translation: Well, what about the chillis? We need chillis for cooking today. Did you get the chillis?

2.3.19 yMing 1
Original:
中元節到了。你需不需要一點冥紙啊？
中元节到了。你需不需要一点冥纸啊？
Transcription: *Zhong-yuan-jie dao le. Ni xu bu xu-yao yi dian ming-zhi ah?(!)*
Translation: It's the Ghost festival soon. Don't you need a little paper money?

2.4 Speaker Wu

2.4.1 wNing 4
Original:
買兩個檸檬泡茶喝。
买两个柠檬泡茶喝。
Transcription: *Mai liang-ge ning-meng pao cha he.*
Translation: I'll take two lemons to make tea with.

2.4.2 wLizhi 4
Original:
啊，荔枝，對。荔枝，龍眼啊。
啊，荔枝，对。荔枝，龙眼啊。
Transcription: *Ah, li-zhi, dui. Li-zhi, long-yan, ah.*
Translation: Ah yes, lichees. Lichees and *longan*.

2.4.3 wLizhi 3
Original:
哦，你這兒有-還有龍眼和荔枝，呵。
哦，你这儿有-还有龙眼和荔枝，呵。
Transcription: *Oh, ni zher you..hai you long-yan he li-zhi ho?(!)*
Translation: Oh, you have..you also have *longan* and lichees, right?

2.4.4 wLizhi 1
Original:
另外，我再買一點檸檬，荔枝和龍眼。
另外，我再买一点柠檬，荔枝和龙眼。
Transcription: *Ling-wai, wo zai mai yi dian ning-meng, li-zhi he long-yan.*
Translation: And apart from that, I'll also buy a few lemons, lichees and *longan*.

2.4.5 wBing 1
Original:
我有一個女兒，她想買一點糖果或者冰淇淋。
我有一个女儿，她想买一点糖果或者冰淇淋。
Transcription: *Wo you yi-ge nü-er; Ta xiang mai yi dian tang-guo huo-zhe bing-qi-lin.*
Translation: I have a daughter; She wants [me] to buy some sweets or ice cream.

2.4.6 wDan 4
Original:
鵝蛋煮湯不太好吧？
鹅蛋煮汤不太好吧？
Transcription: *E-dan zhu tang bu tai hao ba(!)*
Translation: But, you wouldn't want to make a soup with goose eggs, would you?

2.4.7 wMan 4
Original:
饅頭，饅頭？作好的饅頭嗎？
馒头，馒头？作好的馒头吗？
Transcription: *Man-tou? Man-tou? Zuo hao de man-tou ma?(!)*
Translation: What? Dumplings? Ready-made dumplings?

2.4.8 wLa 3
Original:
你辣椒很辣嗎？
你辣椒很辣吗？

Transcription: *Ni la-jiao hen la ma?*
Translation: Is this chilli of yours very hot?

2.4.9 wBing 2
Original:

冰淇淋，忘了没有啊？
冰淇淋，忘了没有啊？

Transcription: *Bing-qi-ling wang le, mei you ah?(!)*
Translation: You didn't forget the ice-cream, did you?

2.4.10 wDan 12
Original:

介於鵝蛋和鴉蛋中間？
介於鹅蛋和鸦蛋中间？

Transcription: *Jie-yü ji-dan he ya-dan (de) zhong-jian?(!)*
Translation: Somewhere between chicken eggs and duck eggs?!

2.4.11 wMan 2
Original:

哎呀，你現成饅頭買回來怕不乾淨吧！
哎呀，你现成馒头买回来怕不乾净吧！

Transcription: *Eijo, ni xian-cheng man-tou mai hui lai, pa bu gan-jing ba(!)*
Translation: Oh dear, the ready-made dumplings you bought may not be all that clean!

2.4.12 wLizhi 2
Original:

又買荔枝，又買龍眼，這幹什麼呀！
又买荔枝，又买龙眼，这干什么呀！

Transcription: *You mai li-zhi, you mai long-yan, zhe gan shemma ya(!)*
Translation: What? You bought lichees and you also bought longan? What on earth did you do that for?!

2.4.13 wBing 3
Original:

啊，我就喜歡檸檬冰淇淋！
啊，我就喜欢柠檬冰淇淋！

Transcription: *Ah, wo jiu xi-huan ning-meng bing-qi-lin.*
Translation: Ah good, lemon ice-cream is what I like best.

2.4.14 wDan 11
Original:

哦，鵝蛋好吃嗎？
哦，鹅蛋好吃吗？

Transcription: *Oh, e-dan hao-chi ma?(!)*
Translation: Oh, do goose eggs taste good?

2.4.15 wMan 3
Original:

呃，饅頭，也有饅頭？
呃，馒头，也有馒头？

Transcription: *Er, man-tou? Ye you man-tou?(!)*
Translation: Er, dumplings? You also sell dumplings?

2.4.16 wLu 4
Original:

我買一公斤鹵肉吧。

我买一公斤卤肉吧。
Transcription: *Wo mai yi gong-jin lu-rou ba.*
Translation: Hm, I guess I'll buy a pound of stewed meat.

2.4.17 wLa 4
Original:
辣椒，是吧？對，我喜歡辣椒。
辣椒，是吧？对，我喜欢辣椒。

Transcription: *La-jiao, shi ba? Dui, wo xi-huan la-jiao.*
Translation: You mean chillis, right? Yes, I like chillis.

2.4.18 wNing 2
Original:
哎呀，買了檸檬！
哎呀，买了柠檬！
Transcription: *Eijo, mai le ning-meng!*
Translation: Oh, my God, you bought lemons!

3. The German and Chinese original texts of passages discussed in Chapter 6

In this section, the German and Chinese dialog passages discussed in Chapter 6 are shown in their original form. They are presented using the same method as in Chapter 6, adapted from the *partitur* - transcription model of Henne & Rehbein 1995. The text of each utterance, including pauses, appears first towards the left of each line, followed by specifications of loudness, pitch, tempo, fluency, voice quality and the auditory feeling of each utterance, given towards the right. Stressed syllables appear in cursive script, *nuclear* (in German) and *focal* (in Chinese) syllables additionally marked by underlining. Reduced vowels in German words are in brackets and large square brackets i.e. '⌊ ' and '⌈ ', mark simultaneous speech and latched-on utterances, following immediately after the preceding speaker turn. As in Henne & Rehbein 1995, pauses are indicated using one or more 'plus'- symbols, each standing for a silent period of approximately 0.4 secs. Thus '+' represents the pause of approx. 0.3-0.7 secs., '++' a pause of approx. 0.8-1.2 secs., and '+++' stands for a pause of between 1,3 and 1,7 secs. Pauses exceeding this length are given in seconds, placed between square brackets.
In the specification of loudness, pitch, tempo and fluency, elevated and reduced values are given in words, mid values not indicated explicitly. Disfluency is indicated using the terms 'disjointed' and 'hesitant', hyperfluency as 'overly fast', 'hurried'. In the description of voice quality the following terms are used for the auditory feeling of phonatory *settings*: 'soft' (for *breathiness*), 'warm' and 'gentle' (for *laxness*), '*matter-of-fact*' (for modal voice), and '*cool*' or '*cold*', (for tense *settings*). The auditory effect of *palatalization* is indicated with the terms 'childlike' or 'childish', the presence of smiling (*labiodentalized voice*), detectable auditively by means of its auditory correlates, is indicated as such in words.

3.1 The German passages

'Moonboots'

C: (1)	Ihr hattet + *Moon*boots in der Werbung.	(mid-slow,sweet, childlike)
S: (2)	*Hat*ten wir, ja, jetzt geht's ja in den *Herbst* 'rein[26]	(mid-fast,warm)
	Aber das sind nur *Kindermoonboots*. ⌈Bis siebenund*drei*ßig, dann ist *Schluss.*	
C: (3)	⌊Nur *Kindermoonboots*?	
	Gut, das *geht* noch. Was für *Far*ben sind das denn?	(slow, pensive)
S: (4)	Die sind meistens *schwarz*, mit so bunten *Mus*tern drauf. Also, hier sind so *schwar*ze,	(mid-fast,
	mit + mit blauen *Zack*en. Welche *Größ*e brauchst du denn?	warm, but matter-of-fact)
C: (5)	Nee, du + also *die Farbe* bei den Moonboots, die gefällt	(slow, a little softer,
	mir dann *doch* net.	disappointed)
S: (6)	Naja, die sind meistens net so *hell*, weil sie im Winter sonst	(brisk, matter-of- fact)
	halt *sehr stark* anschmutzen.	
C: (7)	Ja, aber trotzdem ++ Also, nee ⌈Nein,	(as before)
S: (8)	⌊Hm ⌊Also, bei den *Moon*boots ist *nichts* dabei, hm.	(soft, sympathetic, motherly)
C: (9)	*Moon*boots ++ ist leider *nichts*. Das sah + das sah im Prospect *schö*ner aus.	(sweet, childlike)
S: (10)	Gut.	(warm, accepting)

'No Mangos'

C: (1)	So, jetzt brauch(e) ich noch + er + von der *Obst*theke + *Man*gos, Ba*na*nen ++ und *Ki*wis.	(sweet, childlike)
S: (2)	⌊Hm, hm.	
C: (3)	Was kosten denn die *Man*gos?	(mid-fast, lively)
S: (4)	Die *Man*gos, die + hab(e)n wir im Mo*ment* leider nicht da. Brauchst du sie *drin*gend?	(slow, soft, gentle)
C: (5)	⌊Ohh!	(very disappointed)
C: (6)	Och + das Rezept, das sah ein *Mang*- eine *Man*go + ein bis	(slow, disjointed, distressed, almost tearful)
	zwei *Man*gos vor.	
S: (7)	Also *Man*go ist *schwie*rig. Pa*pa*ya hätt(e) ich da.	(slow, warm, sympathetic, motherly)
C: (8)	*Gut*, ok*ay*.	(a little happier)
S: (9)	Die kosten zwei Mark neunzig das *Stück* und schmecken eigentlich	(as before)
	geschmacklich ziemlich *ähn*lich.	
C: (10)	⌊Ja, hm.	
S: (11)	Die kannst du sicher ers*atz* weise verwenden.	(as before)
C: (12)	Hm hm.	(relieved, happy)

[26] 'rein is a reduced colloquial form for 'hinein' (*into*)

'Summer Onions'

Wi: (1)	Und *dann* brauch(e) ich noch +++ drei Pfund *Zwie*beln.	(mid-fast, friendly)
C: (2)	Drei Pfund *Zwie*beln. Hätten Sie + möchten Sie da net vielleicht	(sweet, childlike,
	auch diese *Sommer*zwiebeln? Mit- er, *Zwie-* mit *Grün*?	disjointed, seemingly unsure)
Wi: (3)	Die + *Frühlings*zwiebeln meinen Sie?	(matter-of-fact, but friendly)
C: (4)	Ja, diese *Früh*lingszwiebeln.	(sweet, friendly, almost apologetic)

'Mangos'

C: (1)	Dann hatten Sie gesagt: *Oran*gen.	(mid-fast, sweet, friendly)
Wi: (2)	⌊Ja.	
C: (3)	Hier, + + er, + wieviel Orangen wollen Sie gerne *ha*ben?	(as before)
Wi: (4)	Zwei *Pfund*.	
C: (5)	Zwei Pfund *Oran*gen, *bi*tte schön! Und, er ++	(as before)
	Ent*schul*digen Sie, aber ich hab(e) *einfach* ver*ges*sen, ich *glaub*(e)	(soft, slow, unsure,apologetic)
	*Man*go war noch das *an*dere, ne?	
Wi: (6)	⌊Ja. ⌊Was kosten die Mangos?	
C: (7)	Die sind leider ++ *nicht* so günstig.	(slow, unsure,
	Die kosten elf Mark *zwan*zig zwei Mangos.	childlike, apologetic)
Wi: (8)	*Zwei* Mangos. Und wenn ich nur *eine* Mango nehme?	(a little cooler, a little displeased)
C: (9)	[2.5] Jaah, (sighs sympathetically) dann halt die *Hälf*te.	(soft, warm)
Wi: (10)	Ja, ich brauch(e) sie aber *trotz*dem + zum *Ko*chen halt.	(cool, disappointed, but not unfriendly)
C: (11)	⌊Gut ⌊Ja	
	Ja, ich mein(e), wenn das Rezept eben so *ist*. Es tut mir nur *leid*,	(slow, sympathetic, disjointed,
	es ist einfach nicht die- die Ja-, richtige *Jah*reszeit für die Mangos.	seemingly helpless)
Wi: (12)	Ja, muß ich in *Kauf* nehmen, ich brauch(e) *trotz*dem eine Mango.	(a little warmer)
C: (13)	⌊Hm hm	

'Whole Goose'

Wi: (1)	Dann nehm(e) ich *kei*ne Blutwurst, aber eine *Gans* brauch(e) ich.	(mid-fast, matter-of-fact)
S: (2)	⌊Hm	
S: (3)	Eine *Gans?* Eine *ganze* Gans?	(surprised, emphatic)
Wi: (4)	⌊Hm ⌊Ja, ne *ganze* Gans.	(as before)
S: (5)	Da muß ich erst mal *nach*fragen. Einen Mo*ment* bitte.	(still quite friendly)
	[1.5]Also, im Augenblick ist sie *nicht* da, aber wenn Sie vielleicht	
	morgen *früh* nachfragen würden? Würde Ihnen das noch *rei*chen?	
Wi: (6)	Morgen *Früh?* Das *wird knapp*, aber	(mid-loud, very emphatic)
S: (7)	Also, ich kann's vers*u*chen, aber im Augenblick ist sie jetzt[27]	
	nicht da. Vielleicht ruf-	(a little cooler)
Wi: (8)	⌊Ist sie dann *frisch*, wenn sie morgen Früh *kom*mt?	(matter-of-fact)
S: (9)	Dann ist sie auf jeden Fall *frisch.*	
Wi: (10)	Dann ist sie *frisch.*	(slow, pensive)
S: (11)	Vielleicht rufen Sie mich heut(e) Nachmittag nochmal *an*,	(friendlier)
	dann kann ich's Ihnen sicher *zu*sagen	
Wi: (12)	Gut. Ja. Sonst kann ich es ja wo*an*ders probieren.	(slow, pensive, slightly cool)
S: (13)	⌊Hm.	(cooler)
Wi: (14)	Ach, ja, bestellen Sie mir ruhig mal die *Gans*.	(mid-fast, matter-of-fact)
S: (15)	Hm. +++ Wollen Sie noch (et)was *ba*cken für ihre Einladung?	(cool)

'Toffee'

S: (1)	Und die *Sah*nebonbons?	(mid-fast, a little cool)
Cr: (2)	Du, ich hab(e) keine *mit*gebracht. +++ Ich	
	glaub(e) die Kinder + die Kinder haben *soviel* Süßigkeiten	
S: (3)	⌊*Keine Sahnebonbons?*	(fast, emphatic, disbelieving)
S: (4)	Oh, Johanna hatte sich aber *unbedingt Sah*nebonbons gewünscht.	(cool, clearly disappointed)
Cr: (4)	Hm, naja	(seems at a loss for words)
S: (5)	Naja, das kannst du ihr dann *sel*ber erklären!	(brisk, matter-of-fact, cool)
Cr: (6)	*Mach*(e) ich.	(equally brisk, but conciliatory)

'Chocolate'

C: (1)	Und die Schoko*la*de? Hast du Schoko*la*de bekommen?	(a little anxious)
H: (2)	Die Schoko*la*de, na*tür*lich, das haben die Kinder mir doch	(matter-of-fact)
	*auf*getragen. Ich habe -	

[27] 's is a colloqial reduced form of 'es' (*it*)

C: (3) ⌊Ich wollte doch Schokolade für den *Kuchen* noch. (mid-fast, louder,
*Wei*ßt du, da aus dem *Son*derangebot, für fünf Mark *ach*tzig. wailing)
H: (4) ⌊Ah! (very sympathetic)
H: (5) Hm, Ach ja, richtig. Das hab ich als *Erstes* gekauft. Das kostete sogar (matter-of-fact, gentle,
nur drei Mark *ach*tzig Schokolade für *Guss*. mid-fast, quite in control)
C: (6) ⌊ Hm hm ⌋
C: (7) Ah ja. (happy, relieved)

'Goose'
C: (1) So, dann muß ich jetzt mal noch sch-, *nach*schauen, was Sie da so (fast, high, very merry, childlike)
an *Wurst* hab(e)n und *Fleisch* (slows down here and lowers pitch)
Li: (2) ⌊Ja
C: (3) Die *Gans* da ist ja *toll* ! Das - (high, fast, childlike, enthusiastic)
Li: (4) ⌊Ah, die *Gans*, ja (also enthusiastic)
C: (5) Ja! (as before)

'Vanilla Sugar'
S: (1) Aber ich war mit den *Back*zutaten noch nicht *fer*tig. Vanil*lin*zucker (soft, mid-slow, warm)
R: (2) ⌊Ah ha? ⌋
brauch(e) ich noch.
R: (3) Ani- er, + Anil*lin*zucker, er, Van-, Vanil*lin*zucker (slow, disjointed, unsure)
S: (4) ⌊Nein, Vanil*lin*- ⌊Vanil*lin*zucker, gen*au*. (soft, gentle, warm, motherly)
R: (5) Vanil*lin*zucker.. ja, das *ha*ben wir.
S: (6) ⌊Hm, hm⌋

3.2 The Chinese passages

'Inviting guests'
W: (1) Wo ming-tian yao *qing ke*. Wo xiang *duo* mai yi dian, wo xian- xian kan nei-ge + (mid-fast, warm, friendly)
shu-cai ba. You *nai-xie* shu-cai, ni-men zher?
[0.8] Wo kan you + *la-jiao*, shi ba (slow, soft, warm, gently coaxing)
S: (2) ⌊You ⌊*la-jiao* Ni *xi-huan* la-jiao, ho? (slow, soft, hesitating, very unsure)
W: (3) *Dui*, *wo* xi-huan la-jiao, ah + oh + (as before)
S: (4) ⌊Hm... ⌊ hm
W: (5) *Hai* you + *yang-cong*, shi ba (again gently helping S. on)
S: (6) ⌊Hm, hm
You + *yang-cong* + *Nan-gua* ke-yi *zhu tang* (as before, still rather unsure)
W: (7) *Dui!* Nan-gua *bu cuo! Hai* you yi xie *bie-de* shu-cai ma? +++ Ahh (fast, enthusiastic, louder)
S: (8) Ah, *hai*-you + *ma-ling-shu*. (louder, faster, becoming a little more confident)
W: (9) *Dui*, *ma-ling-shu*, *dui*, zhu *to-dou-tang* ye *bu cuo*. (as before)
S: (10) ⌊ Hm hm
W: (11) Mmm. *Ling-wai* jiu + *shui-guo* + ye *yao* zhun-bei yi-xie, ho? (slow, soft, again prompting S)
S: (12) Hm, hm. Na, *dang-ran*. (as before)
W: (13) Ni-men *zher* shui-guo (as before)
S: (14) Pi-ru shuo, xian-zai you xin-xian de *li-zhi*, ⌈*long-yan* (mid-loud, mid-fast, confident)
W: (15) ⌊Ahh, *li-zhi*, dui.
Li-zhi, *long-yan*, ah.
S: (16) ⌊Hm

'Orchids'
F: (1) Ran-hou *zai* lai liang-pen *lan-hua*. (mid-slow, warm, friendly)
Y: (2) *Lan-hua*, hao de. *Liang-pen* lan-hua. Ning shi yao *hu-die-lan* ne, hai-shi *tuo-xie-lan* ne,
hai-shi *bao-sui-lan* ne, hai-shi na-you-mei-you te*te ding* de lan-hua? (mid-loud, fast, enthusiastic,
Women *zhe-li*, *dui-bu-qi*, zhi-you *hu-die-lan!* challenging , mock serious)
F: (3) (laughs) Hao-ba, wo *jiu* zhi-hao mai *hu-die-lan.*

'Only Eight Marks'
F: (1) Na, *li-zhi* ne? (mid-soft, a little warily)
Y: (2) *Li-zhi* ma. Er + *li-zhi* xian-zai yi-jing +++ *shang shi* le. Suo-yi shuo, (mid-loud, fast,
li-zhi *hen pian-yi*, yi gong-jin *ba ma-ke* jiu hao. excited, enthusiastic)
[0.8]
F: (3) *Ba - ma - ke* ?! (laughs) Zemma *zhemma gui* de li-zhi ah!? (mid-loud, slow, incredulous)
Y: (4) ⌊*Dui!* (as before)

Y: (4) *Bu hui* ah! Ni zai *de-guo* de hua xian-zai *ba ma-ke* yi gong-jin de li-zhi
yi-jing *hen pian-yi* le! (mid-loud, fast, challenging, mock serious)
F: (5) Oh, na, wo kao-lü , kao-lü *li-zi* ba! (smiles) (soft, mid-slow)

Y: (6) Hao, *li-zi*. Ah! *Li-zi* xian-zai *hen pian-yi!* Yi gong-jin (as before)
zhi yao *jiu make!*
F: (7) *Zhi* yao *jiu ma-ke* !? (mid-loud, slow, laughs)
Y: (8) *Dui* ah! (mid-loud, challenging, as above)

'Avocado'
W: (1) *Hai* you, zheige *luo-li* shi *shemma shui-guo* ya? + Gen- shi gen (friendly, slow, soft,
li-zi *yi yang* de shui-guo ma? hesitating, unsure)
Y: (2) Oh, *bu yi yang.* (mid-loud, matter-of-fact, a little cool)
W: (3) *Bu yi yang*, shi ma. ⌈ luo-li (as before)
Y: (4) ⌊Aha, ⌊ luo-li yi gong-jin + *shi-er make.*
W: (5) Hm, + *shi-er* ma- Na,ta gen li-zi de- nei - shi *nei zhong* wei-dao (fast, soft,
bi-jiao *hao*? Wo xiang *bi-jiao* xia, mai *yi zhong* jiu xing le ya. disjointed, unsure)
Y: (6) Zher + kan *ge-ren xi-hao.* (mid-loud, matter-of-fact, a little cool)
W: (7) Kan *ge-ren* xi-hao. Nei- nei zhong *tian* ne? (as before)
Wo xi-huan *tian yi dian.* (laughs apologetically)
Y: (8) Oh, luo-li shi *mei-you* shemma *tian-wei.* (doesn't laugh or smile) (as before)
W: (9) Ah, luo-li *mei-you* shemma tian-*wie.*

'Lichees'
W: (1) *You* mai *li-zhi*, *you* mai *long-yan*, (very loud, fast, scolding,
zhe *gan shemma*?! almost distraught)
Ch: (2) ⌊*Chi* ah! (smiles) (soft, fast, gentle, jokingly)
W: (3) Tai *duo* le ya! ⌈ Li-zhi gen long-yan shi *yi lei dong-xi!* Ni ru-guo mai le (as before)
Ch: (4) ⌊Bu duo ⌊Bu duo (gentle)
li-zhi, jiu *bu yao* mai long-yan! (as before)
Ch: (5) ⌊Ah, bu duo, bu duo. (as before)
W: (6) ⌊*Hen gui* le ba, (mid-loud, fast, still displeased)
duo-shao-qian yi gong-jin ? (as above)
Ch: (7) ⌊Ni *ai chi*, ni nü-er ye *ai chi* - (mid-loud, faster, gentle)
W: (8) ⌊Aya, li-zhi *duo-shao*
qian yi gong-jin, ni *shuo-shuo!* (loud, fast, scolding and wailing)

'Lemons'
W: (1) Jin-tian kan-le- ni mai *shemma yang-* (fast, mid-loud, confused, seems to be consulting her list)
ni dou gei wo mai le!
Ch: (2) Shi. Ni *rang* wo mai de, wo *dou* gei ni mai le (mid-loud, fast, smiling, joking)
W: (3) Wo- wo rang ni mai *shemma*, wo dou mei you- wo yi-jing *wang* le.
rang ni mai shemma, wo *dou mei you* (as before)
wo yi-jing *wang* le rang ni mai *shemma*, wo *kan-kan*
Ch: (4) ⌊Hm. Oh.
W: (5) Ayo, mai le *ning-meng!* Ning-meng mai (fast, very loud, wailing, horrified,
zemma duo *gan shemma?* Aya! Aya! almost distraught)
Ch: (6) Ning-meng mai *duo* le ma? ⌈Ning- ning- ning-meng- (soft, mid-slow, gentle, surprised)
W: (7) ⌊ Duo ya! Duo ya! Duo ya!
W: (8) *Ning-meng*, aya! Jiu *ni nü-er* yao he *ning-meng cha!* (as before)

'Emperor of China'
Y: (1) Ran-hou, zhe-ge + *lu-rou* ++ *duo-shao-qian?* Zhe-ge *lu ji-chi* (mid-slow, mid-loud,
duo-shao qian? matter-of-fact, stern)
H: (2) Lu ji-chi? (slow, hesitating)
Y: (3) ⌊Ahm. Zhe-ge lu-rou *duo-shao qian?* (as before)
H: (3) Mm, wo *bu zhi-dao* (laughs), ta -
Y: (4) ⌊Ni mai *zhe dai lu-rou*
duo shao, ni *bu-xiao de?!* (fast, loud, very sternly)
[1.2] (H laughs, Y doesn't)
H: (5) *Hao-xiang* shi- shi + *lu-rou* + *hao-xiang* shi + *er-shi*
kuai qian ba. (slow, disjointed, probably consulting his list)
Y: (6) *Er-shi make* lu-rou?! (loud, fast, disbelieving, horrified)
H: (7) Na, er-shi make, *ta*- wo-men ke-yi *chi wu can* ma. (faster, a little more confident, justifying himself)
Y: (8) *Chi wu can?* Ni *dang huang-di* ye?! Chi *nemma hao?!* (mid-loud, scoffing at him, the last part is softer)
(H laughs again)

'Niu-nan'

W: (1) Na, zhe-ge jiao *niu-nan* de dong-xi shi *shemma* dong-xi? (soft, slow, disjointed, unsure)
Wo *bu-dong* zhei- er, er *Dui* ah
L: (2) ⌊Ah, *niu-nan* ah ⌋ (mid-loud, matter-of fact)
L: (3) Zhei shi *niu-rou*- zhe-ge shi- shi (disjointed, a little cool, uncertain)
shu-yu *niu* de yi *bu-fen*. Ta shi *niu-rou* de yi-zhong.
W: (4) ⌊Niu *niu-rou* de yi- (mid-loud, a little surer)
W: (5) Ah, *niu-rou* de yi-zhong.
L: (6) ⌊Dui. (as before)
W: (7) Jiu shi + shi *rou* er bu-shi *nei-zang* ma? (soft, mid-fast, a little unsure again)
L: (8) Ei, zhe shi *rou*, zhe bu shi *nei-zang*. (as before)
W: (9) Ahh ++ Ta *wei-dao* gen- er, qi-ta niu-rou dou shi *yi yang* de ma? (as before)
L: (10) Ei, *cha bu duo*. (as before)
W: (11) Cha bu duo, jiu shi *geng hao chi* yi dian. (fast, mid-loud, strangely certain,
Na *wei shemma* jiao *niu-nan* ne? then slower, softer, again unsure)
L: (12) *Niu-nan* ah + Zhe shi- yin-wei na *bu-wei* bu yi-yang le,
na*ming-zi* jiao de ye bu yi-yang. (slow, disjonted, unsure)
W: (13) ⌊Ahh, zhei-ge wo *zhen* hai shi mei ting dao guo, (soft, sweet, mid-fast)
Dui bu qi! Na, wo jiu *mai* yi dian+ mai + (laughs apologetically, he doesn't)
shao-wei *mai* yi-dian *chang*-chang. (as before, smiles. L. still doesn't smile)

'Duck meat'
Y: (1) Na, *ya-rou*, *e-rou* ne? (mid-fast, mid-loud, merry, friendly)
Hw: (2) Er + ya-rou, nin shi *xin-xian* de ya-rou (mid-soft, slow, disjointed, unsure)
hai shi *sheng-dong* de?
Y: (3) ⌊*Xin-xian, xin-xian*. Bu-shi *leng-dong* ya-rou. (loud, fast, enthusiastic)
Zhe-ge, women *dou* shi *wen-ti ya!* (both laugh)
Hw: (4) Er, ya-zi xian-zai *duo-shao-qian* yi jin ne? (smiling, mid-fast)
Y: (5) Xian-zai ya-zi *dang-ji*, hen *pian-yi*, *er-shi* make yi gong-jin! (fast, loud, enthusiastic)
Hw: (6) Oh, *zhe* hai *pian-yi* ah! (fast, emphatic, challenging)
Y: (7) Ei! (Smiling) (as above)
H: (8) *Hen gui* la! (Smiling) (mid-loud, mid-fast, jokingly protesting)
Y: (9) Ru-guo bu *dang-ji* jiu *geng gui* le! (both laugh) (as above)
H: (10) Hao, na g-, deng guo *ji-ge yue*, pian-yi xia lai wo *zai mai*.
Wo deng dao + *ba kuai qian* yi gong-jin (mid-loud, mid-fast, smiling)
de shi-hou zai mai.
Y: (11) ⌊Oh, *zhei-yang zi!* Na, kong-pa yao *nao ya-wen* cai you! (as above)
(both explode with laughter)

'*Dumplings*'
Hw: (1) *Man-tou* wo ke-yi *zi ji zuo*. Wo bu xu-yao man-tou le. (mid-slow, mid-soft, pensive, smiling)
Y: (2) ⌊Ah
Y: (3) Aha. Nin bu chang-chang, zhe-bian man-tou (mid-fast, mid-loud, challenging)
man you ming de ah! Nei-ge hong dou-zi-,
hong dou-sha xian de *hen hao chi* + nin yao bu yao *chang-chang*?
Hw: (4) Er, hong dou-sha *xian* de (slow, mid-soft, a little disjointed, unsure)
Y: (5) ⌊Dui! (as above)
Hw: (6) Nei-nei jiao *bao-zi*, bu jiao *man-tou* (lacht) (fast, mid-loud, challenging)
Y: (7) ⌊Oh. *Mei-you!* (fast, emphatic, challenging)
Dou-sha-xian de man-tou! (both laugh)

Appendix II

Complementary data relating to Chapter 7

1. The questionnaire used in the sociolinguistic judgement tests (English translation)

Question 1:
Please give your opinion of the general feeling/atmosphere of the conversation as reflected in the utterance you are about to hear, choosing from the following options:

□ Atmosphere of merriness, friendship and harmony
□ Slightly negative feeling, indicating possible conflict
□ Strong negative feeling, presence of open conflict

Can you detect any signs of criticism or humour in the utterance? If so, please specify whether this is:

□ gentle criticism
□ wailing/complaining like a little child
□ strong critique, scolding
□ friendly joking (cordial and genuinely funny)
□ polite joking (less cordial)
□ gentle, friendly irony (*tai-gang*)
□ strong irony, sarcasm (unfriendly)

Question 2:
Please give your opinion of the general attitude of the speaker towards the listener as reflected in the utterance, choosing from the following:

□ very friendly, cordial
□ warm, friendly
□ warm, but distant
□ slightly cool and distant
□ cool, a little unfriendly
□ cold, unfriendly

Question 3:
Please indicate the power position (*footing*) which the speaker seems to be occupying with respect to the listener. Is she:

□ very superior/dominant
□ superior
□ in equal position
□ a little inferior/submissive
□ very inferior/submissive

Question 4:
Please indicate your view of the precise interpersonal attitude of the speaker towards the listener choosing between the following six options:

Relative strength of position	Underlying feeling (undertone)	
	(positive)	(negative)
Very strong	□ very warm, cordial, affectionate, motherly	□ cool superiority, uppishness or arrogance
Relatively strong	□ warm, friendly, considerate	□ a little superior
Weak	□ childlike, confused, helpless (genuine)	□ feigned confusion, helplessness, false weakness (manipulativeness)

2. The results of the sociolinguistic judgement tests

Introduction

The results of the judgement tests for the 74 German and Chinese speech samples, discussed in Chapter 7[1], are presented in the form of numbers in four sets of tables and four pairs of figures. Tables A (Clara, 16 speech samples) and B (Sybille, 17 speech samples) show the results for the German tests, while the results for the Chinese tests are listed in Tables C (You, 19 speech samples) and D (Wu, 18 speech samples). Each table is divided into a certain number of tabular sections separated from each other by bold vertical lines. Each tabular section contains the results for one speech sample[2], shown in six columns and 14 (Wu), 15 (Sybille and You) or 16 (Clara) rows, each row containing the results for one judge. At the top of each tabular section, two rows are separated from the main body of the table by a bold horizontal line. While the first of these rows contains only one datum, the label of the respective speech sample, the second is divided into six spaces bearing the numbers 1, 2, 3a, 3b, 4a and 4b, marked in bold script. These numbers serve to label the six columns of the tabular section and relate to the six different categories of results obtained in the tests. The six categories are as follows:

1	**2**	**3a**	**3b**	**4a**	**4b**
Results for footing (without context)	Results for footing (with context)	Results for strength of position (without context)	Results for valence (without context)	Results for strength of position (with context)	Results for valence (with context)

In the main body of each tabular section each row shows the responses of one judge. There are 16 rows/judges in Tables A (Clara), 15 rows/judges in Tables B and C (Sybille and You) and 14 rows/judges in Table D (Wu). The judges are numbered with a code marked in bold script at the beginning of each row, which consists of the capital letter used to label the respective set of Tables (A, B, C or D) followed by a number, relating to the order in which the judges responses were evaluated.

At the bottom of each tabular section two rows are separated from the main body of the table by a bold horizontal line. These rows, named 'x~' and 'sd', are divided into six spaces, each of which represent a continuation of the six columns of the tabular section. Row 'x~' shows the calculated mean value, or score, for each of the six categories of results, while row 'sd' shows the standard deviation of the responses for each category. The mean scores indicated in what corresponds to columns 1, 3a and 4a correspond to the final mean score of each speech sample for footing, strength or position and valence[3]. The mean scores indicated in columns 2, 3b and 4b were used to examine the influence of the discourse context[4].

The final mean scores for footing, strength of position and valence for each speech sample without context are represented in Figs. 1 (Clara), 3 (Sybille), 5 (You) and 7 (Wu) while the final scores for the speech samples with context are shown in Figs. 2 (Clara), 4 (Sybille), 6 (You) and 8 (Wu).

[1] In Sections 7.2.1 and 7.2.2

[2] Each number represents the score of the corresponding response, calculated according to the system presented in section 7.2.1

[3] These final mean scores were used in the classification of the speech samples according to interaction strategy. (See 7.2.1.2). As discussed in Section 7.2.1 the final mean scores for valence were converted from numerals into positive and negative mathematical signs

[4] See Section 7.2.2

Table A Results for footing, valence and strength of position - Clara

	cGans 1						cBlum 1						cKuli 1						cMoon 1					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
A1	4.0	4.0	2.0	0.0	1.0	0.0	4.0	4.0	1.0	0.0	2.0	1.0	2.0	4.0	1.0	0.0	2.0	1.0	2.0	2.0	1.0	0.0	1.0	0.0
A2	3.0	4.0	2.0	1.0	1.0	0.5	5.0	4.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	2.0	4.0	1.0	1.0	2.0	1.0
A3	3.0	3.0	1.0	1.0	1.0	0.0	4.0	4.0	2.0	1.0	2.0	1.0	2.0	3.0	1.0	0.0	1.0	0.0	2.0	3.0	1.0	0.0	2.0	1.0
A4	2.0	1.0	1.0	0.5	1.0	1.0	4.0	4.0	0.5	1.0	2.0	0.0	1.0	2.0	1.0	0.5	1.0	0.0	5.0	1.0	1.0	0.0	1.0	0.0
A5	1.0	2.0	1.0	0.0	1.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	0.0	2.0	0.0
A6	2.0	4.0	2.0	1.0	1.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0	2.0	4.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0
A7	4.0	4.0	3.0	0.0	2.0	0.0	3.0	4.0	3.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	3.0	1.0
A8	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	0.0	2.0	1.0	3.0	4.0	2.0	1.0	2.0	0.0
A9	2.0	5.0	1.0	1.0	2.0	0.0	4.0	4.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	3.0	3.0	3.0	1.0	2.0	1.0
A10	2.0	5.0	1.0	1.0	2.0	0.0	4.0	4.0	2.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	2.0	1.0	2.0	4.0	1.0	0.0	3.0	0.0
A11	2.0	2.0	2.0	1.0	2.0	1.0	3.0	2.0	2.0	1.0	1.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	0.0	2.0	1.0
A12	3.0	3.0	1.0	1.0	2.0	0.0	4.0	4.0	-	-	1.0	0.0	2.0	4.0	1.0	1.0	2.0	1.0	4.0	3.0	3.0	1.0	2.0	1.0
A13	3.0	4.0	1.0	1.0	3.0	0.0	5.0	3.0	3.0	1.0	2.0	0.0	2.0	4.0	1.0	1.0	2.0	0.0	1.0	4.0	1.0	1.0	2.0	0.0
A14	3.0	3.0	1.0	1.0	2.0	0.0	3.0	3.0	0.5	1.0	2.0	1.0	2.0	3.0	1.0	1.0	2.0	1.0	3.0	3.0	1.0	1.0	2.0	1.0
A15	4.0	4.0	2.0	1.0	2.0	0.0	4.0	4.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	0.0
A16	2.0	4.0	1.0	0.5	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0	3.0	4.0	2.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	2.0	1.0
x~	**2.6**	**3.4**	**1.5**	**0.8**	**1.7**	**0.4**	**3.8**	**3.6**	**1.9**	**1.0**	**1.9**	**0.8**	**2.3**	**3.2**	**1.3**	**0.8**	**1.7**	**0.8**	**2.5**	**3.1**	**1.4**	**0.7**	**2.0**	**0.6**
sd	0.8	1.1	0.6	0.4	0.6	0.5	0.7	0.6	0.7	0.0	0.4	0.4	0.7	0.9	0.5	0.4	0.5	0.4	1.0	1.0	0.7	0.5	0.5	0.5

Table A 1

	cMango 1						cMango 2						cZwieb 2						cVani 2					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
A1	4.0	4.0	3.0	0.0	1.0	0.0	4.0	3.0	2.0	0.0	2.0	1.0	4.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0
A2	5.0	4.0	2.0	0.0	2.0	1.0	3.0	5.0	2.0	1.0	3.0	1.0	5.0	5.0	3.0	1.0	2.0	0.0	4.0	4.0	3.0	1.0	2.0	1.0
A3	2.0	4.0	2.0	0.0	2.0	0.0	2.0	3.0	1.0	0.0	2.0	1.0	5.0	4.0	2.0	0.0	2.0	0.0	4.0	5.0	2.0	1.0	2.0	0.0
A4	5.0	5.0	2.0	0.0	3.0	0.0	3.0	5.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	1.0	2.0	0.0	4.0	5.0	2.0	0.0	2.0	0.0
A5	5.0	4.0	2.0	0.0	3.0	0.0	4.0	4.0	2.0	0.5	2.0	0.0	4.0	4.0	2.0	1.0	2.0	0.0	4.0	5.0	2.0	0.0	3.0	0.0
A6	4.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	1.0	0.0	2.0	1.0	4.0	4.0	3.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0
A7	4.0	4.0	3.0	0.0	3.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	0.0	4.0	4.0	3.0	1.0	2.0	0.0
A8	3.0	3.0	2.0	0.0	2.0	0.0	3.0	3.0	2.0	0.0	2.0	1.0	4.0	4.0	2.0	0.0	2.0	0.0	3.0	4.0	2.0	1.0	2.0	0.0
A9	4.0	4.0	2.0	0.0	3.0	0.0	2.0	4.0	1.0	0.0	2.0	0.0	4.0	5.0	1.0	0.0	2.0	0.0	3.0	5.0	2.0	1.0	2.0	0.0
A10	5.0	4.0	1.0	0.0	2.0	1.0	2.0	4.0	1.0	0.0	2.0	0.0	5.0	5.0	2.0	0.0	2.0	0.0	5.0	4.0	2.0	0.0	2.0	0.0
A11	4.0	2.0	2.0	0.0	1.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0
A12	5.0	4.0	2.0	0.5	2.0	0.0	4.0	4.0	2.0	0.0	3.0	1.0	3.0	5.0	2.0	0.0	2.0	0.0	4.0	2.0	2.0	0.0	3.0	0.0
A13	4.0	5.0	1.0	0.0	2.0	0.0	3.0	3.0	2.0	1.0	2.0	0.0	4.0	4.0	3.0	1.0	3.0	0.0	5.0	5.0	1.0	0.0	3.0	0.0
A14	3.0	3.0	1.0	0.5	3.0	0.0	3.0	3.0	-	-	2.0	1.0	3.0	3.0	2.0	1.0	2.0	0.0	3.0	4.0	2.0	0.0	2.0	0.0
A15	5.0	4.0	2.0	0.0	2.0	0.0	3.0	3.0	1.0	0.0	2.0	1.0	4.0	3.0	3.0	1.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0
A16	4.0	4.0	2.0	0.0	2.0	0.0	3.0	4.0	3.0	0.5	2.0	0.0	3.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	1.0	2.0	1.0
x~	**4.1**	**3.9**	**1.9**	**0.1**	**2.3**	**0.2**	**3.1**	**3.8**	**1.7**	**0.3**	**2.1**	**0.5**	**4.0**	**4.1**	**2.2**	**0.5**	**2.1**	**0.1**	**3.9**	**4.2**	**2.1**	**0.5**	**2.2**	**0.2**
sd	0.9	0.7	0.5	0.2	0.6	0.4	0.7	0.7	0.6	0.4	0.4	0.5	0.7	0.6	0.6	0.5	0.3	0.3	0.6	0.8	0.5	0.5	0.4	0.4

Table A 2

	cSchoko 2						cMoon 3						cKuli 2						cMango 3					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
A1	4.0	4.0	1.0	1.0	2.0	0.0	3.0	3.0	2.0	0.0	3.0	1.0	2.0	4.0	1.0	1.0	2.0	0.0	4.0	3.0	3.0	1.0	3.0	1.0
A2	3.0	4.0	1.0	1.0	2.0	1.0	2.0	4.0	2.0	1.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0	4.0	3.0	3.0	1.0	3.0	1.0
A3	4.0	5.0	2.0	0.0	2.0	0.0	3.0	4.0	2.0	1.0	3.0	1.0	4.0	5.0	1.0	0.0	2.0	0.0	3.0	3.0	2.0	1.0	2.0	1.0
A4	1.0	4.0	1.0	1.0	2.0	0.0	3.0	3.0	2.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	2.0	0.0	4.0	3.0	3.0	1.0	1.0	1.0
A5	3.0	2.0	1.0	1.0	1.0	0.0	3.0	4.0	2.0	1.0	3.0	1.0	4.0	5.0	2.0	0.0	2.0	0.0	1.0	2.0	1.0	1.0	1.0	0.0
A6	2.0	4.0	1.0	0.0	1.0	1.0	4.0	4.0	2.0	0.5	2.0	1.0	2.0	2.0	1.0	1.0	2.0	0.0	4.0	2.0	2.0	1.0	1.0	1.0
A7	3.0	2.0	1.0	1.0	2.0	0.0	3.0	4.0	2.0	1.0	3.0	1.0	4.0	5.0	2.0	0.0	2.0	0.0	2.0	2.0	1.0	1.0	1.0	1.0
A8	4.0	4.0	1.0	0.0	2.0	0.0	4.0	4.0	2.0	1.0	2.0	1.0	3.0	4.0	2.0	0.0	2.0	0.0	4.0	2.0	2.0	1.0	2.0	1.0
A9	2.0	3.0	1.0	0.0	2.0	1.0	2.0	4.0	2.0	1.0	2.0	0.0	3.0	4.0	1.0	1.0	2.0	0.0	2.0	1.0	1.0	0.0	1.0	0.0
A10	2.0	2.0	1.0	1.0	1.0	0.0	2.0	2.0	1.0	0.0	1.0	0.0	4.0	5.0	2.0	0.0	2.0	0.0	2.0	1.0	1.0	0.0	1.0	0.0
A11	2.0	4.0	1.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	1.0	2.0	3.0	1.0	0.0	2.0	1.0	3.0	2.0	3.0	1.0	1.0	1.0
A12	2.0	2.0	1.0	1.0	1.0	1.0	3.0	4.0	-	-	2.0	1.0	2.0	3.0	1.0	1.0	2.0	0.0	4.0	3.0	1.5	0.5	1.0	1.0
A13	4.0	5.0	1.0	0.5	1.0	1.0	4.0	4.0	2.0	0.0	2.0	1.0	2.0	5.0	2.0	0.0	3.0	0.0	5.0	2.0	3.0	1.0	1.0	1.0
A14	2.0	3.0	1.0	1.0	1.0	0.0	4.0	3.0	-	-	1.0	0.0	2.0	3.0	1.0	1.0	2.0	0.0	3.0	3.0	1.0	1.0	1.0	1.0
A15	2.0	3.0	1.0	0.0	1.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0	3.0	3.0	2.0	1.0	2.0	1.0
A16	2.0	4.0	1.0	1.0	2.0	0.0	3.0	-	3.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	2.0	0.0	3.0	3.0	2.0	1.0	2.0	1.0
x~	**2.5**	**3.4**	**1.1**	**0.6**	**1.5**	**0.3**	**3.2**	**3.7**	**2.0**	**0.7**	**2.1**	**0.7**	**2.8**	**3.9**	**1.5**	**0.5**	**2.0**	**0.1**	**2.6**	**3.4**	**1.5**	**0.8**	**1.7**	**0.4**
sd	0.9	1.1	0.3	0.5	0.5	0.5	0.8	0.6	0.4	0.5	0.6	0.5	0.9	1.1	0.5	0.5	0.4	0.4	0.8	1.1	0.6	0.4	0.6	0.5

Table A 3

	cZwieb 3						cBlut 3						cSchoko 3						cBlum 3					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
A1	1.0	3.0	1.0	0.0	3.0	1.0	4.0	3.0	2.0	0.0	3.0	1.0	4.0	3.0	3.0	1.0	3.0	1.0	4.0	3.0	2.0	0.0	3.0	1.0
A2	1.0	2.0	1.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
A3	1.0	3.0	1.0	0.0	2.0	1.0	3.0	4.0	2.0	1.0	2.0	1.0	4.0	3.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0
A4	1.0	1.0	1.0	0.5	1.0	1.0	2.0	3.0	2.0	1.0	3.0	1.0	5.0	4.0	3.0	0.0	2.0	0.0	2.0	3.0	2.0	1.0	3.0	1.0
A5	4.0	2.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	3.0	0.0	3.0	2.0	2.0	1.0	1.0	0.0	2.0	3.0	2.0	1.0	2.0	1.0
A6	2.0	2.0	1.0	1.0	1.0	0.0	4.0	4.0	2.0	1.0	1.0	0.0	4.0	4.0	2.0	1.0	3.0	0.0	4.0	4.0	2.0	1.0	2.0	1.0
A7	1.0	1.0	1.0	1.0	1.0	0.0	4.0	3.0	3.0	1.0	2.0	1.0	4.0	3.0	3.0	1.0	3.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0
A8	2.0	2.0	1.0	1.0	2.0	1.0	4.0	4.0	3.0	0.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0
A9	1.0	2.0	1.0	1.0	1.0	1.0	3.0	3.0	2.0	1.0	3.0	1.0	3.0	4.0	3.0	1.0	2.0	0.0	3.0	3.0	2.0	1.0	2.0	1.0
A10	2.0	2.0	1.0	0.0	1.0	0.0	5.0	3.0	2.0	0.0	2.0	1.0	2.0	2.0	1.0	0.0	2.0	1.0	2.0	3.0	1.0	1.0	2.0	1.0
A11	3.0	3.0	1.0	0.0	2.0	1.0	2.0	3.0	1.0	0.0	2.0	1.0	3.0	2.0	2.0	1.0	3.0	1.0	2.0	3.0	1.0	0.0	2.0	1.0
A12	1.0	2.0	1.0	1.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0
A13	1.0	2.0	1.0	1.0	1.0	0.0	2.0	5.0	1.0	1.0	2.0	0.0	4.0	5.0	3.0	1.0	3.0	1.0	4.0	4.0	2.0	1.0	2.0	0.0
A14	1.0	3.0	1.0	1.0	1.0	1.0	5.0	2.0	2.0	0.0	2.0	1.0	5.0	3.0	2.5	0.5	2.0	1.0	3.0	3.0	3.0	1.0	2.0	1.0
A15	2.0	3.0	1.0	1.0	2.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0	4.0	4.0	3.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0
A16	2.0	2.0	1.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	0.0	4.0	4.0	2.0	1.0	2.0	0.0
x~	**1.7**	**2.1**	**1.1**	**0.7**	**1.5**	**0.7**	**3.5**	**3.5**	**2.0**	**0.6**	**2.1**	**0.8**	**3.7**	**3.3**	**2.3**	**0.8**	**2.2**	**0.6**	**3.3**	**3.5**	**1.9**	**0.8**	**2.1**	**0.8**
sd	0.9	0.6	0.3	0.5	0.5	0.5	1.1	0.7	0.5	0.5	0.5	0.4	0.8	0.9	0.6	0.4	0.6	0.5	0.9	0.5	0.5	0.4	0.3	0.4

Table A 4

	cKuli 3						cGans 4						cBlum 4						cBlut 4					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
A1	4.0	4.0	2.0	0.0	2.0	1.0	3.0	2.0	2.0	1.0	1.0	0.0	2.0	2.0	1.0	1.0	1.0	0.0	3.0	2.0	2.0	0.0	2.0	0.0
A2	3.0	4.0	2.0	1.0	3.0	1.0	3.0	2.0	2.0	1.0	1.0	0.0	2.0	2.0	1.0	1.0	1.0	1.0	4.0	3.0	1.0	1.0	2.0	1.0
A3	4.0	4.0	2.0	0.0	2.0	1.0	3.0	3.0	1.0	1.0	2.0	1.0	2.0	3.0	1.0	0.0	2.0	1.0	5.0	3.0	2.0	0.0	1.0	1.0
A4	4.0	5.0	2.0	0.0	3.0	0.0	3.0	3.0	2.0	0.0	2.0	1.0	1.0	2.0	1.0	0.5	1.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0
A5	4.0	2.0	2.0	0.0	3.0	0.0	2.0	2.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	0.0	1.0	0.0	2.0	2.0	1.0	0.0	1.0	1.0
A6	4.0	4.0	2.0	1.0	2.0	0.0	2.0	3.0	1.0	1.0	-	-	2.0	2.0	1.0	1.0	1.0	0.0	5.0	2.0	2.0	0.0	1.0	0.0
A7	4.0	4.0	2.0	0.0	3.0	0.0	4.0	3.0	2.0	0.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0
A8	4.0	4.0	2.0	0.0	2.0	0.0	3.0	2.0	2.0	1.0	1.0	1.0	2.0	3.0	1.0	1.0	2.0	1.0	3.0	3.0	2.0	0.0	2.0	1.0
A9	3.0	5.0	2.0	0.0	3.0	0.0	3.0	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	0.0	1.0	1.0	4.0	4.0	2.0	0.0	2.0	0.0
A10	4.0	4.0	2.0	1.0	2.0	0.0	4.0	3.0	2.0	0.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	5.0	3.0	3.0	0.0	2.0	1.0
A11	4.0	4.0	3.0	0.0	3.0	0.0	2.0	3.0	1.0	0.0	3.0	1.0	1.0	3.0	1.0	1.0	1.0	1.0	2.0	3.0	1.0	1.0	2.0	1.0
A12	3.0	4.0	2.0	1.0	2.0	0.0	3.0	3.0	2.0	1.0	1.0	1.0	3.0	2.0	1.5	1.0	1.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0
A13	4.0	4.0	2.0	0.5	2.0	0.0	3.0	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	0.0	1.0	0.0	2.0	3.0	1.0	0.0	1.0	0.0
A14	4.0	4.0	2.0	0.5	2.0	0.0	-	3.0	-	-	2.0	1.0	1.0	3.0	1.0	1.0	2.0	1.0	3.0	3.0	1.0	0.0	2.0	1.0
A15	4.0	4.0	3.0	0.0	2.0	0.0	3.0	4.0	2.0	1.0	3.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	3.0	3.0	3.0	0.0	2.0	0.0
A16	4.0	4.0	3.0	1.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	4.0	2.0	1.0	1.0	1.0	1.0	3.0	2.0	2.0	1.0	1.0	1.0
x~	**3.8**	**4.0**	**2.2**	**0.4**	**2.4**	**0.2**	**2.9**	**2.7**	**1.6**	**0.7**	**1.6**	**0.9**	**1.9**	**2.1**	**1.0**	**0.7**	**1.2**	**0.8**	**3.4**	**2.8**	**1.7**	**0.3**	**1.6**	**0.7**
sd	0.4	0.7	0.4	0.5	0.5	0.4	0.7	0.6	0.5	0.5	0.8	0.3	0.8	0.6	0.1	0.5	0.4	0.4	1.1	0.6	0.7	0.5	0.5	0.5

Table A 5

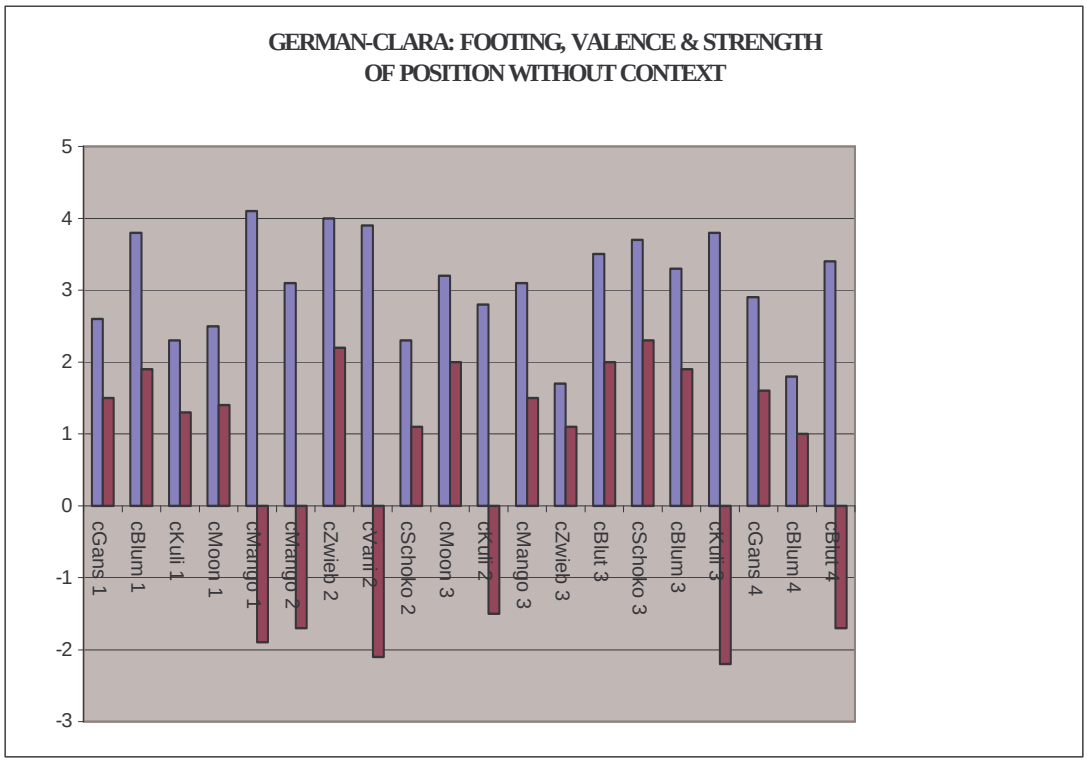

Fig. 1: Results for footing, valence and strength of position, based on Tables A1 to A5

Footing without context (**blue**): Col. 1, **(x~)**
Valence and Strength of Position without context (**red**): Col. 3a and 3b, **(x~)**

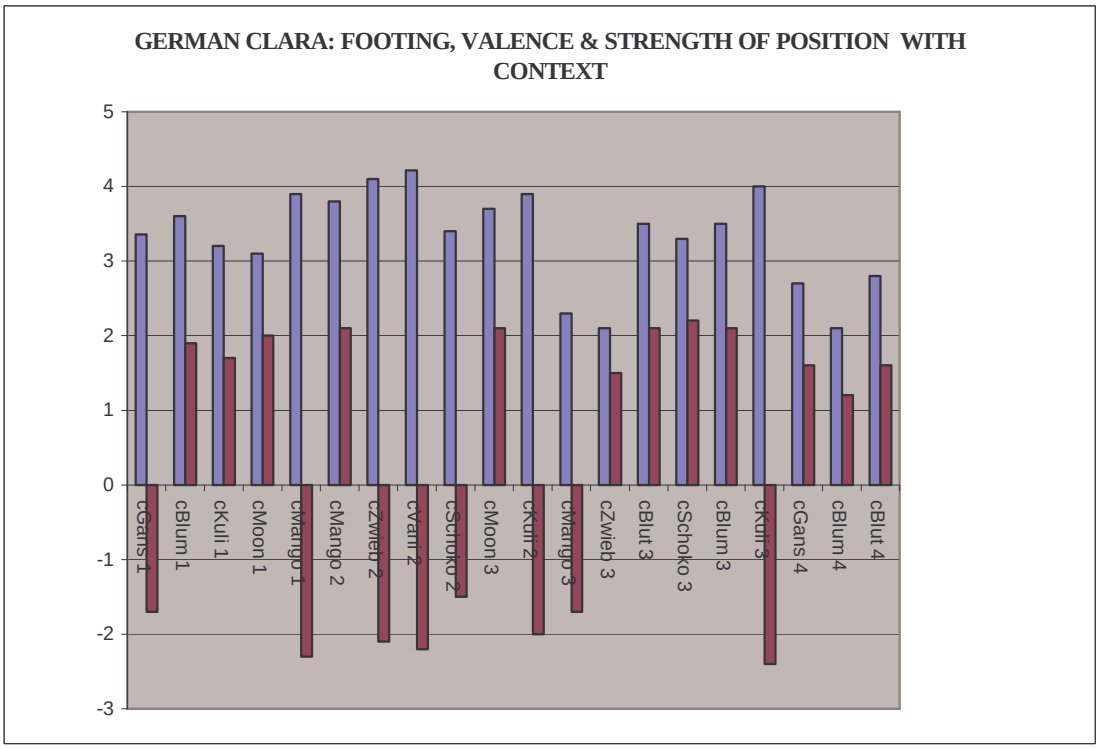

Fig. 2: Results for footing, valence and strength of position, based on Tables A1 to A5

Footing with context (**blue**): Col. 2, **(x~)**
Valence and Strength of Position with context (**red**): Col. 4a and 4b, **(x~)**

Table B Results for footing, valence and strength of position – Sybille

	sKiwi 1						sGans 1						sSchoko 1						sKuli 1					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
B1	5.0	4.0	2.0	0.0	2.0	0.0	4.0	3.0	2.0	0.0	1.0	1.0	4.0	4.0	2.0	0.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
B2	3.0	4.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0	3.0	4.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
B3	4.0	4.0	1.5	0.5	2.0	1.0	2.0	4.0	1.0	0.0	1.0	1.0	4.0	3.0	2.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	2.0	1.0
B4	4.0	5.0	-	-	2.0	0.0	4.0	2.0	2.0	0.0	1.0	0.0	4.0	3.0	2.0	0.0	2.0	1.0	2.0	4.0	1.5	0.5	2.0	1.0
B5	4.0	5.0	2.0	0.0	2.0	1.0	2.0	4.0	2.0	1.0	2.0	1.0	3.0	4.0	2.0	0.0	2.0	1.0	2.0	4.0	1.0	1.0	2.0	1.0
B6	3.0	3.0	-	-	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	3.0	3.0	1.0	1.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0
B7	2.0	2.0	1.0	1.0	1.0	0.0	4.0	4.0	3.0	1.0	1.0	0.0	2.0	2.0	1.0	0.0	1.0	0.0	4.0	4.0	2.0	1.0	2.0	1.0
B8	5.0	4.0	3.0	0.0	2.0	0.0	2.0	2.0	2.0	1.0	1.0	0.0	2.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	1.5	0.5	2.0	1.0
B9	2.0	5.0	1.0	0.0	2.0	0.0	4.0	1.0	2.0	0.0	1.0	0.0	3.0	2.0	2.0	1.0	1.0	0.0	2.0	1.0	1.0	1.0	1.0	0.0
B10	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	3.0	1.0	4.0	3.0	-	-	2.0	1.0	4.0	4.0	-	-	2.0	1.0
B11	5.0	4.0	3.0	0.0	2.0	0.0	4.0	2.0	1.0	0.0	1.0	0.0	4.0	4.0	3.0	0.0	2.0	0.0	2.0	3.0	1.0	0.5	2.0	1.0
B12	3.0	4.0	1.0	0.5	2.0	0.0	3.0	4.0	3.0	0.0	1.0	0.0	4.0	3.0	3.0	0.0	2.0	1.0	4.0	3.0	1.0	1.0	2.0	1.0
B13	4.0	4.0	2.0	0.0	2.0	0.0	2.0	2.0	1.0	1.0	2.0	1.0	4.0	4.0	2.0	0.0	2.0	0.0	2.0	3.0	1.0	1.0	2.0	1.0
B14	3.0	4.0	2.0	0.0	2.0	1.0	2.0	3.0	1.0	1.0	2.0	1.0	3.0	4.0	2.0	0.0	2.0	1.0	1.0	3.0	1.0	0.0	1.0	0.0
B15	4.0	2.0	3.0	0.0	1.0	1.0	2.0	2.0	1.0	0.0	1.0	1.0	5.0	4.0	3.0	0.0	3.0	0.0	2.0	2.0	1.0	0.0	1.0	0.0
x~	**3.5**	**3.8**	**2.0**	**0.3**	**1.9**	**0.5**	**2.9**	**2.8**	**1.7**	**0.6**	**1.4**	**0.6**	**3.4**	**3.3**	**2.1**	**0.4**	**1.9**	**0.6**	**2.4**	**3.1**	**1.2**	**0.7**	**1.7**	**0.8**
sd	0.9	1.0	0.8	0.4	0.4	0.5	0.9	1.1	0.7	0.5	0.6	0.5	0.9	0.7	0.6	0.5	0.5	0.5	0.9	0.9	0.4	0.4	0.5	0.4

Table B 1

	sBlum 1						sMoon 1						sMoon 2						sKiwi 2					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
B1	4.0	4.0	2.0	0.0	2.0	1.0	3.0	4.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	0.0	2.0	1.0	4.0	3.0	2.5	0.5	2.0	1.0
B2	3.0	2.0	1.0	1.0	2.0	1.0	3.0	4.0	1.0	1.0	1.0	1.0	4.0	3.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	0.5	2.0	1.0
B3	3.0	2.0	1.0	1.0	1.0	1.0	3.0	4.0	1.0	1.0	2.0	1.0	4.0	2.0	2.0	0.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
B4	2.0	2.0	1.0	0.5	1.0	0.0	3.0	4.0	2.0	1.0	2.0	1.0	5.0	3.0	3.0	0.0	2.0	1.0	3.0	3.0	2.0	0.0	2.0	1.0
B5	4.0	5.0	1.0	1.0	2.0	1.0	4.0	5.0	-	-	2.0	1.0	3.0	4.0	1.0	1.0	2.0	1.0	3.0	4.0	2.0	1.0	2.0	1.0
B6	1.0	2.0	1.0	0.0	1.0	0.0	3.0	3.0	-	-	2.0	1.0	4.0	3.0	3.0	0.0	2.0	1.0	4.0	3.0	-	-	2.0	1.0
B7	4.0	-	2.0	0.0	1.0	0.0	4.0	4.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0	5.0	4.0	2.0	0.0	2.0	1.0
B8	5.0	2.0	3.0	0.0	1.0	0.0	3.0	4.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0
B9	4.0	1.0	1.0	0.0	1.0	0.0	2.0	4.0	1.0	1.0	1.0	1.0	3.0	2.0	3.0	1.0	1.0	0.0	3.0	5.0	1.5	0.5	2.0	0.0
B10	4.0	3.0	-	-	2.0	1.0	3.0	4.0	2.0	1.0	2.0	1.0	3.0	4.0	2.0	1.0	3.0	1.0	3.0	4.0	1.0	1.0	3.0	0.0
B11	2.0	2.0	1.0	0.0	1.0	0.0	4.0	4.0	3.0	0.0	3.0	0.0	4.0	4.0	1.0	0.0	3.0	0.0	2.0	4.0	1.0	0.0	3.0	0.0
B12	3.0	2.0	1.0	0.0	2.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0	4.0	3.0	2.0	1.0	3.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0
B13	3.0	3.0	1.0	0.5	2.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0	3.0	3.0	2.0	0.0	3.0	1.0	5.0	4.0	2.0	0.0	2.0	0.0
B14	2.0	4.0	1.0	0.5	2.0	1.0	4.0	4.0	3.0	1.0	2.0	1.0	4.0	4.0	3.0	0.0	2.0	0.0	3.0	2.0	1.0	0.0	1.0	0.0
B15	4.0	4.0	1.0	1.0	2.0	1.0	4.0	4.0	2.0	0.0	2.0	0.0	3.0	3.0	2.0	1.0	3.0	0.0	4.0	5.0	2.0	0.5	2.0	0.0
x~	**3.1**	**2.6**	**1.2**	**0.4**	**1.5**	**0.6**	**3.4**	**3.9**	**1.9**	**0.7**	**1.9**	**0.9**	**3.6**	**3.2**	**2.1**	**0.6**	**2.3**	**0.7**	**3.6**	**3.6**	**1.7**	**0.3**	**2.1**	**0.6**
sd	1.1	1.1	0.6	0.4	0.5	0.5	0.6	0.5	0.7	0.5	0.5	0.4	0.6	0.7	0.7	0.5	0.6	0.5	0.9	0.8	0.4	0.4	0.5	0.5

Table B 2

	sBlum 2						sMango 3						sKiwi 3						sSchoko 3					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
B1	3.0	4.0	2.5	0.5	2.0	1.0	4.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	1.0	2.0	0.0	4.0	4.0	2.0	0.5	2.0	1.0
B2	2.0	2.0	1.5	1.0	2.0	1.0	3.0	4.0	2.0	1.0	2.0	0.0	4.0	3.0	2.0	1.0	2.0	1.0	4.0	4.0	1.5	1.0	2.0	1.0
B3	3.0	4.0	2.0	1.0	2.0	0.0	5.0	3.0	2.0	0.0	2.0	0.0	4.0	3.0	2.0	1.0	2.0	1.0	4.0	-	2.0	0.0	2.0	1.0
B4	2.0	5.0	3.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	3.0	1.0	4.0	5.0	2.5	0.5	3.0	1.0	3.0	4.0	2.0	1.0	2.0	1.0
B5	3.0	4.0	2.0	1.0	2.0	0.0	4.0	5.0	2.0	0.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0	3.0	4.0	2.0	1.0	2.0	1.0
B6	2.0	4.0	1.0	1.0	2.0	1.0	4.0	4.0	2.0	0.0	2.0	0.0	5.0	3.0	2.0	0.0	1.0	1.0	4.0	3.0	3.0	0.0	2.0	1.0
B7	4.0	2.0	2.0	1.0	1.0	0.0	4.0	5.0	2.0	0.0	2.0	0.0	4.0	4.0	-	-	2.0	1.0	2.0	4.0	1.5	1.0	2.0	1.0
B8	4.0	4.0	2.0	0.0	2.0	0.0	5.0	4.0	3.0	0.0	3.0	0.0	5.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	3.0	0.0	2.0	0.0
B9	5.0	4.0	2.0	0.0	2.0	0.0	5.0	5.0	3.0	0.0	2.0	0.0	3.0	4.0	2.0	1.0	2.0	0.0	4.0	3.0	2.0	0.0	2.0	1.0
B10	4.0	4.0	2.0	0.0	2.0	0.0	5.0	4.0	2.0	0.0	2.0	0.0	3.0	3.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	0.0	3.0	0.0
B11	4.0	4.0	3.0	0.0	3.0	0.0	5.0	5.0	3.0	0.0	3.0	0.0	4.0	4.0	3.0	0.0	3.0	0.0	3.0	3.0	2.0	1.0	2.0	1.0
B12	4.0	3.0	2.0	1.0	2.0	0.0	3.0	3.0	2.0	1.0	3.0	0.0	3.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0	1.0
B13	4.0	3.0	2.0	0.0	2.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0	4.0	3.0	3.0	0.0	2.0	1.0	3.0	3.0	2.0	0.0	2.0	0.0
B14	3.0	2.0	2.0	1.0	1.0	1.0	5.0	4.0	3.0	0.5	2.0	0.0	4.0	4.0	3.0	0.0	2.0	0.0	4.0	3.0	2.0	0.0	2.0	1.0
B15	2.0	4.0	1.5	0.0	2.0	0.0	5.0	3.0	2.0	0.0	2.0	0.0	4.0	3.0	2.0	1.0	2.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0
x~	**3.3**	**3.5**	**2.0**	**0.5**	**1.9**	**0.3**	**4.4**	**4.0**	**2.3**	**0.2**	**2.3**	**0.2**	**3.9**	**3.6**	**2.3**	**0.6**	**2.1**	**0.7**	**3.4**	**3.5**	**2.1**	**0.4**	**2.1**	**0.8**
sd	1.0	0.9	0.5	0.5	0.5	0.5	0.7	0.8	0.5	0.4	0.5	0.4	0.6	0.6	0.4	0.5	0.5	0.5	0.8	0.5	0.4	0.5	0.3	0.4

Table B 3

	sBlum 3						sKiwi 4						sKuli 4						sSchoko 4					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
B1	4.0	4.0	2.0	1.0	2.0	0.0	4.0	4.0	2.0	1.0	2.0	0.0	3.0	3.0	2.0	1.0	2.0	0.0	4.0	3.0	2.0	1.0	2.0	1.0
B2	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
B3	4.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	4.0	-	2.0	1.0	2.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0
B4	-	4.0	1.5	1.0	2.0	1.0	4.0	3.0	2.0	0.5	2.0	1.0	4.0	3.0	3.0	1.0	2.0	0.0	4.0	3.0	-	-	2.0	1.0
B5	4.0	4.0	2.0	1.0	2.0	1.0	3.0	4.0	1.5	1.0	2.0	1.0	4.0	3.0	3.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
B6	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0
B7	4.0	4.0	1.5	0.5	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	2.0	1.0	2.0	4.0	-	-	2.0	1.0
B8	4.0	3.0	3.0	1.0	2.0	1.0	3.0	2.0	2.0	1.0	1.0	0.0	4.0	3.0	2.0	1.0	2.0	1.0	4.0	5.0	2.0	0.0	2.0	0.0
B9	2.0	3.0	1.5	1.0	2.0	1.0	3.0	2.0	2.0	1.0	1.0	0.0	5.0	3.0	2.0	0.0	2.0	1.0	4.0	4.0	2.0	1.0	1.0	0.0
B10	3.0	2.0	1.0	1.0	1.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	-	-	2.0	1.0	4.0	4.0	3.0	0.0	2.0	0.0
B11	5.0	2.0	2.0	0.0	2.0	1.0	2.0	4.0	1.0	0.0	2.0	1.0	4.0	4.0	3.0	0.0	3.0	0.0	4.0	3.0	3.0	0.0	2.0	1.0
B12	3.0	3.0	2.0	1.0	2.0	1.0	4.0	3.0	3.0	1.0	2.0	1.0	4.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
B13	3.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	0.5	2.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0
B14	4.0	4.0	3.0	1.0	2.0	1.0	3.0	2.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	0.0	3.0	0.0	4.0	3.0	3.0	0.0	2.0	1.0
B15	4.0	4.0	3.0	0.0	3.0	0.0	4.0	4.0	2.0	1.0	2.0	1.0	5.0	3.0	3.0	1.0	2.0	1.0	4.0	3.0	2.0	0.5	2.0	1.0
x~	**3.5**	**3.2**	**2.0**	**0.8**	**2.0**	**0.9**	**3.1**	**3.1**	**2.0**	**0.9**	**1.9**	**0.9**	**3.8**	**3.2**	**2.2**	**0.7**	**2.1**	**0.8**	**3.6**	**3.4**	**2.3**	**0.4**	**1.9**	**0.8**
sd	0.8	0.7	0.6	0.4	0.4	0.3	0.7	0.7	0.4	0.3	0.4	0.4	0.8	0.4	0.6	0.5	0.4	0.4	0.6	0.6	0.5	0.5	0.3	0.4

Table B 4

Judges	sMango 4					
	1	**2**	**3a**	**3b**	**4a**	**4b**
B1	3.0	4.0	2.0	1.0	2.0	1.0
B2	2.0	3.0	2.0	1.0	2.0	1.0
B3	3.0	3.0	2.0	1.0	2.0	1.0
B4	3.0	4.0	2.0	1.0	2.0	0.0
B5	3.0	4.0	2.0	1.0	2.0	1.0
B6	3.0	3.0	2.0	1.0	2.0	1.0
B7	4.0	4.0	2.0	1.0	2.0	1.0
B8	3.0	3.0	2.0	1.0	2.0	1.0
B9	2.0	4.0	1.0	1.0	2.0	0.0
B10	3.0	3.0	2.0	1.0	2.0	1.0
B11	2.0	4.0	2.0	1.0	2.0	1.0
B12	3.0	3.0	2.0	1.0	2.0	1.0
B13	2.0	3.0	2.0	1.0	2.0	1.0
B14	4.0	4.0	2.0	1.0	2.0	0.0
B15	-	3.0	2.0	1.0	2.0	1.0
x~	**2.8**	**3.4**	**1.9**	**1.0**	**2.0**	**0.8**
Sd	0.7	0.5	0.3	0.0	0.0	0.4

Table B5

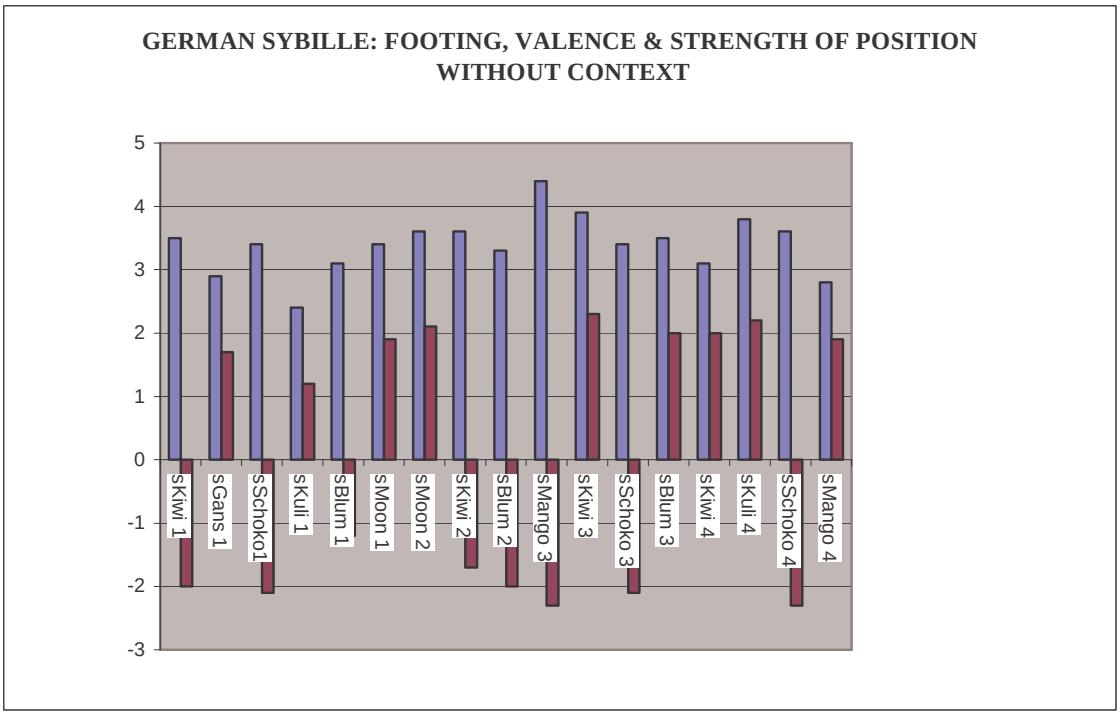

Fig. 3: Results for footing, valence and strength of position, based on Tables B1 to B5

Footing without context (**blue**): Col. 1, **(x~)**
Valence and Strength of Position without context (**red**): Col. 3a and 3b, **(x~)**

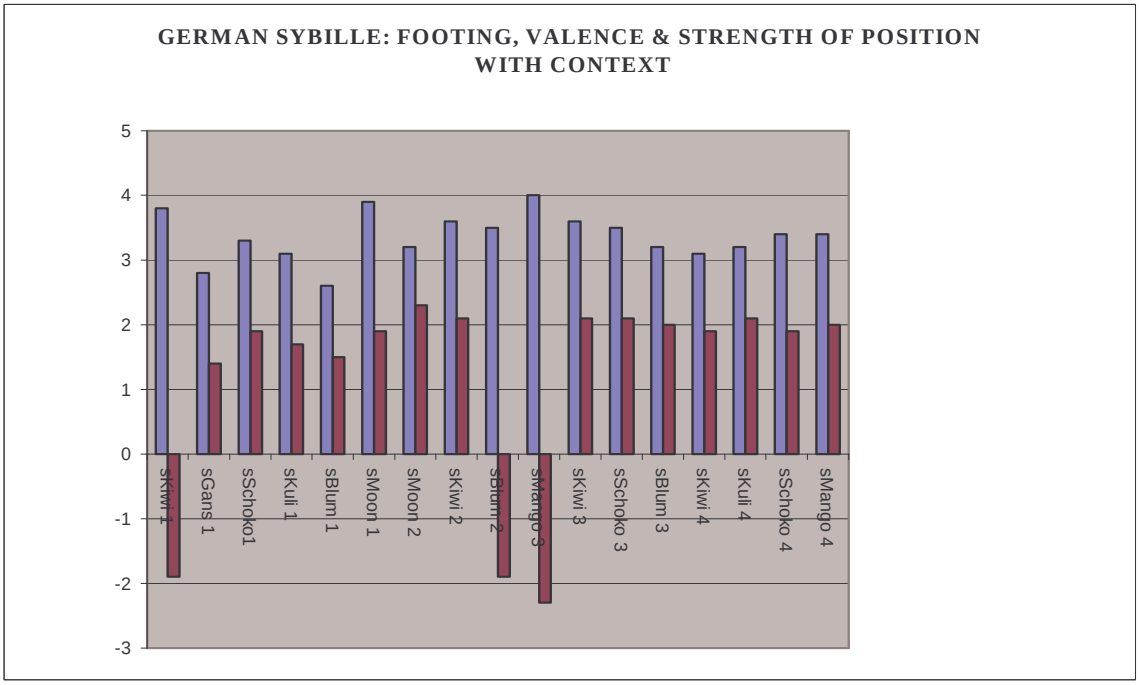

Fig. 4: Results for footing, valence and strength of position, based on Tables B1 to B5

Footing with context (**blue**): Col. 2, **(x~)**
Valence and Strength of Position with context (**red**): Col. 4a and 4b, **(x~)**

Table C Results for footing, valence and strength of position -You

	yDang 1						yLizhi 1						yLing 1						yLong 1					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
C1	3.0	3.0	3.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
C2	4.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	1.5	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0	1.0
C3	4.0	3.0	3.0	1.0	2.0	1.0	4.0	3.0	3.0	1.0	3.0	1.0	3.0	3.0	3.0	1.0	2.0	1.0	4.0	4.0	3.0	0.0	3.0	1.0
C4	2.0	3.0	1.0	0.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	2.0	2.0	1.0	2.0	1.0	2.0	3.0	2.0	1.0	3.0	1.0
C5	4.0	5.0	3.0	0.0	3.0	0.0	4.0	5.0	3.0	1.0	3.0	1.0	2.0	4.0	1.5	1.0	3.0	0.0	4.0	5.0	2.0	0.0	3.0	1.0
C6	2.0	3.0	3.0	1.0	3.0	1.0	4.0	3.0	2.0	1.0	3.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	4.0	3.0	2.0	0.0	3.0	1.0
C7	4.0	5.0	3.0	0.0	3.0	1.0	4.0	5.0	3.0	0.0	3.0	1.0	4.0	4.0	3.0	1.0	3.0	1.0	4.0	4.0	2.0	1.0	3.0	0.0
C8	3.0	3.0	1.0	0.0	2.0	1.0	3.0	3.0	2.0	1.0	3.0	1.0	3.0	2.0	2.0	1.0	2.0	1.0	4.0	3.0	2.0	0.0	3.0	1.0
C9	3.0	3.0	2.0	1.0	3.0	1.0	3.0	3.0	2.5	1.0	3.0	1.0	3.0	3.0	-	-	3.0	1.0	5.0	3.0	3.0	0.0	3.0	1.0
C10	3.0	-	1.0	1.0	1.0	1.0	-	4.0	1.5	1.0	3.0	0.0	4.0	-	1.0	1.0	1.0	1.0	4.0	-	1.0	0.0	1.0	1.0
C11	3.0	4.0	1.0	0.0	2.0	1.0	4.0	4.0	3.0	1.0	2.0	1.0	3.0	3.0	3.0	0.0	2.0	1.0	2.0	4.0	2.0	1.0	3.0	1.0
C12	3.0	2.0	3.0	0.0	3.0	1.0	3.0	1.0	1.0	0.0	3.0	1.0	3.0	2.0	2.0	1.0	2.0	1.0	4.0	1.0	2.0	0.0	1.0	0.0
C13	4.0	3.0	2.0	0.0	3.0	1.0	3.0	3.0	2.0	1.0	3.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	1.0	2.0	1.0
C14	4.0	3.0	2.0	0.0	2.0	1.0	4.0	4.0	2.0	1.0	3.0	1.0	4.0	3.0	3.0	0.0	2.0	1.0	5.0	4.0	2.0	0.0	2.0	1.0
C15	4.0	4.0	1.0	0.0	3.0	1.0	2.0	2.0	2.0	1.0	2.0	1.0	4.0	2.0	2.0	1.0	2.0	1.0	4.0	2.0	2.0	0.0	3.0	1.0
x~	**3.3**	**3.4**	**2.1**	**0.4**	**2.4**	**0.9**	**3.3**	**3.3**	**2.2**	**0.9**	**2.7**	**0.9**	**3.2**	**2.9**	**2.2**	**0.9**	**2.1**	**0.9**	**3.6**	**3.2**	**2.1**	**0.4**	**2.5**	**0.9**
sd	0.7	0.8	0.9	0.5	0.6	0.3	0.7	1.0	0.6	0.4	0.5	0.3	0.6	0.7	0.6	0.4	0.5	0.3	1.0	1.0	0.5	0.5	0.7	0.4

Table C 1

	yMan 1						yMing 1						yLizhi 2						yLa 2					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
C1	4.0	3.0	3.0	1.0	3.0	1.0	3.0	3.0	3.0	1.0	3.0	1.0	5.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	3.0	0.0
C2	2.0	3.0	1.5	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	5.0	4.0	2.0	0.0	3.0	1.0	4.0	4.0	2.0	0.0	2.0	0.0
C3	4.0	4.0	3.0	1.0	3.0	1.0	3.0	3.0	2.0	1.0	3.0	1.0	5.0	4.0	2.0	0.0	3.0	0.0	4.0	4.0	2.0	0.0	1.0	1.0
C4	2.0	3.0	3.0	1.0	3.0	1.0	2.0	3.0	1.0	0.0	2.0	1.0	2.0	4.0	3.0	0.0	3.0	0.0	4.0	4.0	3.0	0.0	3.0	0.0
C5	4.0	4.0	3.0	1.0	3.0	1.0	3.0	4.0	1.0	0.0	3.0	1.0	5.0	5.0	3.0	0.0	2.0	0.0	5.0	5.0	2.0	0.0	2.0	0.0
C6	3.0	3.0	3.0	1.0	3.0	1.0	3.0	3.0	2.0	1.0	3.0	1.0	4.0	4.0	2.0	0.0	2.0	0.0	4.0	3.0	2.0	0.0	3.0	0.0
C7	5.0	4.0	2.0	1.0	3.0	1.0	5.0	2.0	3.0	1.0	1.0	1.0	5.0	5.0	2.0	0.0	2.0	0.0	5.0	5.0	3.0	0.0	2.0	0.0
C8	3.0	2.0	2.0	1.0	3.0	1.0	3.0	3.0	2.0	0.0	2.0	1.0	5.0	4.0	2.0	0.0	3.0	0.0	5.0	5.0	3.0	0.0	2.0	0.0
C9	3.0	3.0	2.5	1.0	3.0	1.0	3.0	3.0	2.0	1.0	3.0	1.0	5.0	4.0	3.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0
C10	3.0	-	1.5	1.0	1.0	1.0	3.0	-	1.0	0.0	1.0	1.0	4.0	4.0	3.0	0.0	2.0	0.0	4.0	-	3.0	0.0	2.0	0.0
C11	4.0	4.0	3.0	1.0	3.0	1.0	4.0	4.0	3.0	1.0	3.0	1.0	5.0	5.0	2.0	0.0	2.0	0.0	4.0	4.0	3.0	0.0	2.0	0.0
C12	4.0	1.0	3.0	1.0	1.0	0.0	3.0	1.0	1.0	0.0	3.0	1.0	4.0	4.0	2.0	0.0	3.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0
C13	3.0	3.0	1.0	1.0	3.0	1.0	5.0	3.0	2.0	0.0	2.0	1.0	5.0	4.0	3.0	0.0	2.0	0.0	5.0	3.0	3.0	0.0	2.0	0.0
C14	4.0	4.0	3.0	1.0	3.0	1.0	4.0	4.0	3.0	0.0	2.0	1.0	5.0	5.0	2.0	0.0	2.0	0.0	5.0	5.0	2.0	0.0	2.0	0.0
C15	2.0	2.0	2.0	1.0	3.0	1.0	2.0	3.0	2.0	1.0	2.0	1.0	5.0	5.0	3.0	0.0	3.0	0.0	5.0	5.0	3.0	0.0	2.0	0.0
x~	**3.3**	**3.1**	**2.4**	**1.0**	**2.7**	**0.9**	**3.3**	**3.0**	**2.0**	**0.5**	**2.3**	**1.0**	**4.6**	**4.3**	**2.4**	**0.0**	**2.4**	**0.1**	**4.4**	**4.2**	**2.5**	**0.0**	**2.1**	**0.1**
sd	0.9	0.9	0.7	0.0	0.7	0.3	0.9	0.8	0.8	0.5	0.7	0.0	0.8	0.5	0.5	0.0	0.5	0.3	0.5	0.7	0.5	0.0	0.5	0.3

Table C 2

	yMan 2						yLu 2						yLong 2						yLing 2					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
C1	4.0	4.0	3.0	0.0	3.0	1.0	4.0	3.0	3.0	0.0	2.0	0.0	4.0	3.0	2.0	0.0	2.0	0.0	4.0	4.0	3.0	0.0	3.0	0.0
C2	4.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0
C3	4.0	4.0	3.0	0.0	2.0	0.0	4.0	3.0	3.0	0.0	2.0	1.0	5.0	5.0	3.0	0.0	2.0	0.0	4.0	3.0	2.0	0.0	2.0	0.0
C4	4.0	4.0	2.0	0.0	3.0	0.0	2.0	3.0	2.0	1.0	3.0	0.0	4.0	4.0	3.0	0.0	3.0	0.0	2.0	3.0	2.0	1.0	2.0	1.0
C5	5.0	5.0	3.0	0.0	3.0	0.0	4.0	5.0	2.0	0.0	3.0	0.0	5.0	5.0	2.0	0.0	2.0	0.0	4.0	5.0	2.0	0.0	2.0	0.0
C6	4.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0
C7	2.0	4.0	1.0	1.0	3.0	1.0	4.0	4.0	1.0	1.0	3.0	0.0	5.0	5.0	2.0	0.0	3.0	0.0	2.0	2.0	1.0	0.0	1.0	1.0
C8	4.0	4.0	2.0	0.0	2.0	0.0	3.0	4.0	2.0	1.0	2.0	0.0	4.0	4.0	3.0	0.0	2.0	0.0	4.0	4.0	3.0	0.0	2.0	1.0
C9	4.0	4.0	2.0	0.0	2.0	0.0	3.0	4.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0	3.0	3.0	1.0	1.0	2.0	1.0
C10	-	4.0	2.0	0.0	2.0	0.0	-	4.0	1.0	0.0	2.0	0.0	4.0	4.0	3.0	0.0	2.0	0.0	-	3.0	2.0	0.0	2.0	0.0
C11	5.0	4.0	3.0	0.0	3.0	0.0	4.0	5.0	3.0	0.0	2.0	0.0	5.0	5.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	1.0	3.0	0.0
C12	4.0	3.0	3.0	0.0	1.0	0.0	3.0	4.0	1.0	0.0	3.0	0.0	4.0	4.0	2.0	0.0	3.0	0.0	2.0	3.0	1.0	0.0	1.0	0.0
C13	3.0	3.0	1.0	1.0	2.0	0.0	3.0	3.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0	4.0	3.0	2.0	0.0	2.0	1.0
C14	5.0	5.0	3.0	0.0	2.0	0.0	4.0	4.0	3.0	0.0	3.0	0.0	5.0	5.0	2.0	0.0	2.0	0.0	5.0	5.0	3.0	0.0	3.0	0.0
C15	5.0	4.0	3.0	0.0	3.0	0.0	4.0	3.0	2.0	0.0	2.0	0.0	4.0	5.0	2.0	0.0	2.0	0.0	4.0	2.0	1.0	1.0	1.0	1.0
x~	**4.1**	**4.0**	**2.3**	**0.1**	**2.3**	**0.1**	**3.6**	**3.8**	**2.1**	**0.2**	**2.3**	**0.1**	**4.3**	**4.3**	**2.3**	**0.0**	**2.2**	**0.0**	**3.6**	**3.5**	**1.9**	**0.3**	**2.0**	**0.4**
sd	0.8	0.5	0.7	0.4	0.6	0.4	0.6	0.7	0.7	0.4	0.5	0.3	0.5	0.6	0.5	0.0	0.4	0.0	0.9	0.9	0.7	0.5	0.7	0.5

Table C 3

	yLu 3						yLong 3						yMing 3						yMan 3					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
C1	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
C2	3.0	3.0	1.0	1.0	2.0	1.0	2.0	3.0	1.0	1.0	1.0	1.0	3.0	3.0	1.0	1.0	1.0	1.0	3.0	3.0	2.0	0.0	2.0	1.0
C3	3.0	4.0	3.0	1.0	2.0	1.0	2.0	3.0	1.0	1.0	2.0	1.0	3.0	3.0	1.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
C4	2.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
C5	4.0	3.0	1.5	1.0	2.0	1.0	2.0	3.0	1.0	1.0	2.0	1.0	3.0	5.0	1.0	1.0	3.0	0.0	4.0	4.0	2.0	1.0	2.0	1.0
C6	3.0	3.0	2.0	1.0	2.0	1.0	3.0	4.0	1.0	1.0	1.0	1.0	3.0	4.0	2.0	1.0	1.0	1.0	4.0	3.0	2.0	1.0	2.0	1.0
C7	1.0	4.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	3.0	0.0	2.0	4.0	1.0	1.0	3.0	1.0
C8	2.0	3.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	4.0	3.0	2.0	1.0	2.0	1.0
C9	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	1.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
C10	3.0	-	1.0	1.0	3.0	0.0	3.0	-	2.0	1.0	3.0	0.0	4.0	-	1.0	1.0	3.0	0.0	-	-	3.0	0.0	3.0	0.0
C11	3.0	4.0	3.0	0.0	3.0	0.0	3.0	4.0	1.0	1.0	2.0	1.0	4.0	2.0	2.0	1.0	2.0	1.0	4.0	3.0	3.0	0.0	2.0	1.0
C12	2.0	3.0	1.0	0.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0	1.0	3.0	2.0	2.0	1.0	2.0	1.0
C13	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	1.0	1.0	2.0	1.0
C14	4.0	4.0	3.0	0.0	3.0	0.0	2.0	4.0	1.0	1.0	2.0	1.0	4.0	4.0	1.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	2.0	1.0
C15	2.0	3.0	1.0	1.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	3.0	3.0	1.0	1.0	2.0	1.0	3.0	2.0	1.0	1.0	2.0	1.0
x~	**2.7**	**3.3**	**1.8**	**0.8**	**2.2**	**0.8**	**2.4**	**3.0**	**1.3**	**1.0**	**1.8**	**0.9**	**3.1**	**3.3**	**1.5**	**1.0**	**2.1**	**0.8**	**3.1**	**3.1**	**1.9**	**0.8**	**2.1**	**0.9**
sd	0.8	0.5	0.7	0.4	0.4	0.4	0.6	0.7	0.5	0.0	0.6	0.3	0.6	0.7	0.5	0.0	0.6	0.4	0.7	0.6	0.6	0.4	0.4	0.3

Table C 4

	yLizhi 4						yLong 4						yBing 4					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
C1	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	1.5	1.0	2.0	1.0	3.0	3.0	3.0	1.0	2.0	1.0
C2	2.0	3.0	1.0	1.0	1.0	1.0	2.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0
C3	3.0	3.0	3.0	1.0	3.0	1.0	4.0	4.0	1.5	1.0	3.0	1.0	3.0	3.0	2.0	1.0	3.0	1.0
C4	2.0	2.0	2.0	1.0	3.0	1.0	2.0	2.0	3.0	1.0	3.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
C5	4.0	4.0	2.0	1.0	3.0	1.0	5.0	5.0	3.0	0.0	3.0	0.0	3.0	3.0	2.0	1.0	2.0	1.0
C6	3.0	4.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	1.0	3.0	1.0	2.0	2.0	1.0	1.0	3.0	1.0
C7	2.0	4.0	1.0	1.0	2.0	1.0	5.0	5.0	3.0	1.0	3.0	0.0	5.0	5.0	3.0	1.0	2.0	1.0
C8	2.0	3.0	2.0	1.0	3.0	1.0	4.0	2.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	1.0	2.0	1.0
C9	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.5	1.0	3.0	1.0	3.0	3.0	3.0	1.0	2.0	1.0
C10	-	-	1.0	1.0	3.0	0.0	-	-	1.0	1.0	3.0	0.0	-	-	3.0	0.0	3.0	0.0
C11	3.0	4.0	2.0	1.0	3.0	0.0	3.0	2.0	2.0	1.0	3.0	1.0	3.0	4.0	2.0	1.0	3.0	0.0
C12	2.0	2.0	3.0	1.0	2.0	1.0	2.0	1.0	3.0	1.0	3.0	1.0	3.0	1.0	2.0	1.0	3.0	1.0
C13	4.0	3.0	2.0	0.0	2.0	1.0	4.0	3.0	2.0	0.0	3.0	1.0	3.0	3.0	1.0	1.0	2.0	1.0
C14	2.0	4.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	0.0	4.0	3.0	2.0	1.0	2.0	0.0
C15	3.0	4.0	1.0	0.0	1.0	1.0	2.0	2.0	3.0	1.0	1.0	0.0	2.0	4.0	1.0	1.0	2.0	1.0
x~	**2.7**	**3.3**	**1.9**	**0.9**	**2.3**	**0.9**	**3.3**	**3.0**	**2.2**	**0.9**	**2.7**	**0.7**	**2.9**	**3.0**	**1.9**	**0.9**	**2.3**	**0.8**
Sd	0.7	0.7	0.7	0.4	0.7	0.4	1.1	1.2	0.8	0.4	0.6	0.5	0.9	1.0	0.8	0.3	0.5	0.4

Table C 5

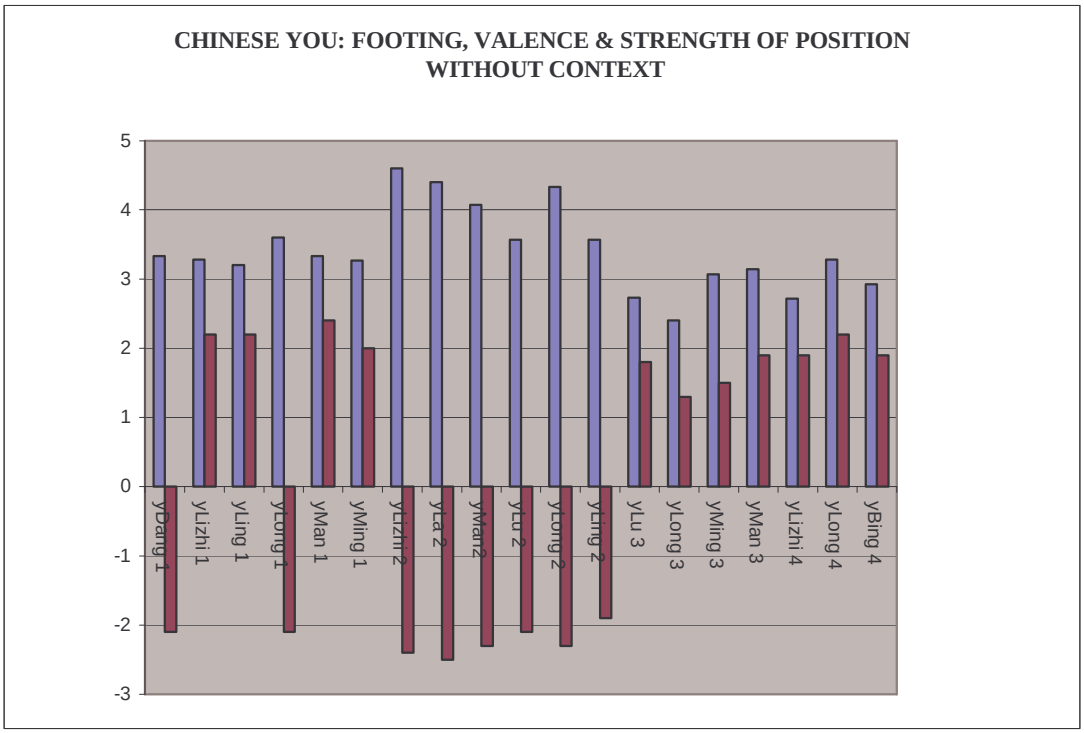

Fig. 5: Results for footing, valence and strength of position, based on Tables C1 to C5

Footing without context (**blue**): Col. 1, **(x~)**
Valence and Strength of Position without context (**red**): Col. 3a and 3b, **(x~)**

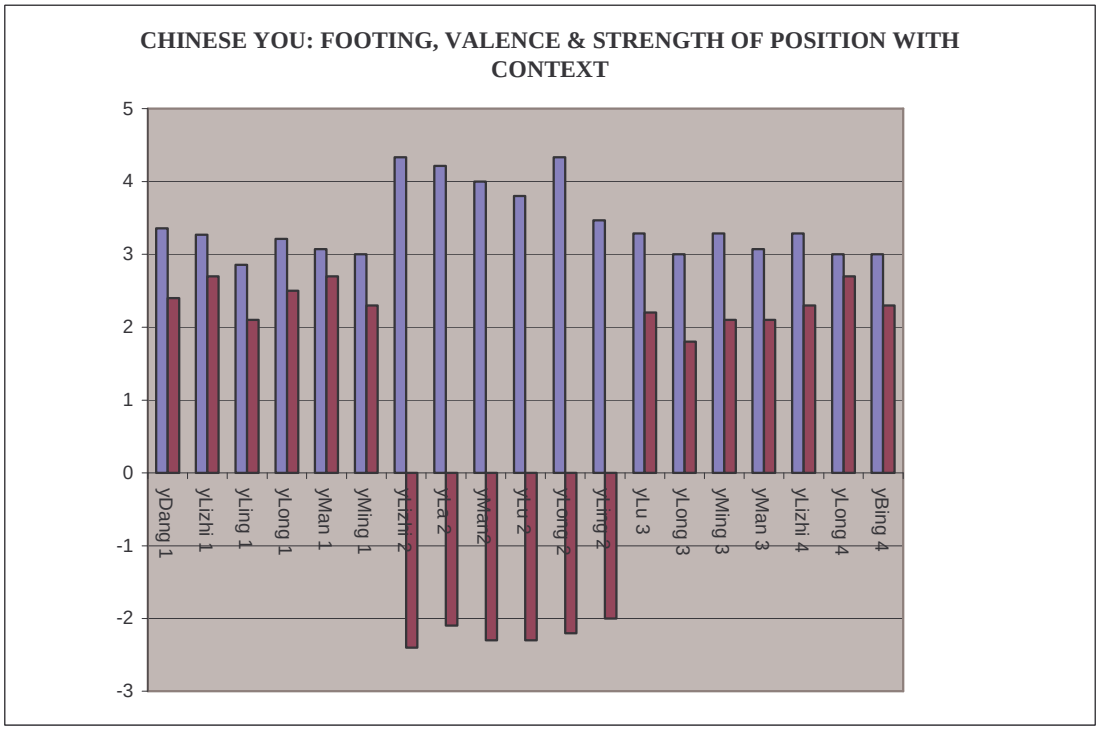

Fig. 6: Results for footing, valence and strength of position, based on Tables C1 to C5

Footing with context (**blue**): Col. 2, **(x~)**
Valence and Strength of Position with context (**red**): Col. 4a and 4b, **(x~)**

Table D Results for footing, valence and strength of position -Wu

	wLizhi 1						wDan 11						wDan 12						wBing 1					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
D1	2.0	3.0	2.0	1.0	2.0	1.0	1.0	2.0	3.0	1.0	2.0	1.0	4.0	3.0	3.0	0.0	2.0	1.0	2.0	1.0	3.0	1.0	3.0	1.0
D2	4.0	2.0	3.0	1.0	1.0	1.0	3.0	4.0	2.0	1.0	2.0	0.0	2.0	4.0	1.0	0.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0
D3	4.0	4.0	3.0	0.0	2.0	0.0	5.0	4.0	2.0	0.0	2.0	0.0	4.0	5.0	2.0	0.0	2.0	0.0	3.0	3.0	2.0	0.0	2.0	0.0
D4	3.0	3.0	2.0	1.0	2.0	1.0	4.0	3.0	2.0	1.0	2.0	1.0	4.0	3.0	1.0	0.0	2.0	1.0	2.0	3.0	1.0	0.0	2.0	1.0
D5	3.0	4.0	3.0	0.5	2.0	0.0	4.0	3.0	2.0	1.0	1.0	1.0	4.0	3.0	2.0	0.0	3.0	1.0	4.0	3.0	2.0	0.0	3.0	1.0
D6	2.0	2.0	3.0	0.0	2.0	1.0	5.0	2.0	2.0	0.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	0.0	2.0	4.0	2.0	1.0	3.0	1.0
D7	3.0	3.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	3.0	1.0	3.0	4.0	2.0	1.0	2.0	1.0	3.0	2.0	3.0	1.0	3.0	1.0
D8	3.0	3.0	2.0	1.0	2.0	1.0	3.0	4.0	2.0	1.0	1.0	0.0	4.0	2.0	3.0	1.0	1.0	1.0	2.0	1.0	2.0	0.0	2.0	1.0
D9	3.0	3.0	3.0	0.5	2.0	1.0	2.0	2.0	2.0	0.5	2.0	1.0	2.0	4.0	2.0	0.5	2.0	0.0	4.0	3.0	2.0	1.0	2.0	1.0
D10	4.0	3.0	2.0	1.0	2.0	1.0	4.0	2.0	2.0	0.0	2.0	1.0	2.0	3.0	1.0	1.0	2.0	1.0	3.0	2.0	2.0	1.0	3.0	1.0
D11	3.0	3.0	2.0	1.0	1.0	1.0	4.0	4.0	2.0	0.0	1.0	1.0	4.0	4.0	1.0	0.0	2.0	0.0	3.0	4.0	3.0	0.0	2.0	1.0
D12	2.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	0.0	3.0	1.0	3.0	3.0	2.0	1.0	3.0	0.0	4.0	3.0	2.0	1.0	3.0	1.0
D13	2.0	1.0	2.0	1.0	1.0	1.0	3.0	3.0	2.0	1.0	1.0	0.0	3.0	4.0	2.0	0.5	1.0	1.0	3.0	3.0	2.0	1.0	3.0	1.0
D14	4.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	0.0	3.0	2.0	2.0	1.0	2.0	1.0
x~	**3.0**	**2.9**	**2.4**	**0.8**	**1.8**	**0.9**	**3.4**	**3.1**	**2.1**	**0.6**	**1.8**	**0.7**	**3.2**	**3,4**	**1.8**	**0.5**	**1.9**	**0.6**	**3.0**	**2.7**	**2.1**	**0.6**	**2.5**	**0.9**
Sd	0.8	0.8	0.5	0.4	0.4	0.4	1.1	0.8	0.3	0.5	0.7	0.5	0.9	0.9	0.7	0.5	0.6	0.5	0.8	1.0	0.5	0.5	0.5	0.3

Table D 1

	wLizhi 3						wNing 2						wLizhi 2						wMan 2					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
D1	2.0	2.0	2.0	1.0	2.0	1.0	4.0	4.0	1.0	0.0	2.0	0.0	5.0	5.0	2.0	0.0	3.0	0.0	4.0	4.0	3.0	1.0	1.0	1.0
D2	1.0	2.0	1.0	1.0	1.0	1.0	5.0	5.0	2.0	0.0	2.0	0.0	5.0	5.0	2.0	0.0	2.0	0.0	5.0	5.0	2.0	0.0	2.0	0.0
D3	4.0	4.0	2.0	0.0	2.0	0.0	1.0	5.0	1.0	1.0	1.0	1.0	5.0	5.0	1.5	0.5	2.0	0.0	5.0	5.0	2,.0	0.0	2.0	0.0
D4	2.0	3.0	1.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	1.0	1.0	5.0	5.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	0.0
D5	3.0	4.0	2.0	1.0	2.0	0.0	2.0	4.0	1.0	1.0	1.0	1.0	4.0	4.0	2.0	0.0	3.0	1.0	4.0	4.0	3.0	0.0	3.0	1.0
D6	2.0	1.0	2.0	0.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	5.0	2.0	2.0	0.0	1.0	0.0	2.0	4.0	1.0	0.0	2.0	1.0
D7	3.0	2.0	2.0	1.0	2.0	1.0	4.0	5.0	3.0	1.0	1.0	1.0	5.0	5.0	1.0	1.0	2.0	0.0	4.0	4.0	1.0	0.0	3.0	0.0
D8	1.0	3.0	1.0	1.0	2.0	1.0	5.0	5.0	2.0	0.0	2.0	0.0	5.0	4.0	2.0	0.0	1.0	1.0	4.0	4.0	2.0	0.0	2.0	0.0
D9	3.0	3.0	2.0	0.0	2.0	1.0	2.0	5.0	1.0	0.5	1.0	1.0	4.0	5.0	1.0	0.0	3.0	0.0	4.0	4.0	3.0	0.0	2.0	0.0
D10	4.0	2.0	3.0	0.0	2.0	1.0	1.0	4.0	1.0	0.5	1.0	1.0	5.0	5.0	1.0	1.0	2.0	0.0	4.0	4.0	1.0	1.0	2.0	0.0
D11	4.0	4.0	2.0	1.0	1.0	1.0	2.0	5.0	1.0	1.0	1.0	1.0	5.0	5.0	2.0	0.0	2.0	0.0	4.0	5.0	1.5	0.0	1.0	1.0
D12	3.0	3.0	2.0	1.0	2.0	1.0	1.0	3.0	1.0	1.0	1.0	1.0	5.0	3.0	2.0	0.0	2.0	0.0	2.0	3.0	1.0	1.0	2.0	0.0
D13	2.0	4.0	1.0	0.0	1.0	1.0	2.0	5.0	1.0	0.0	2.0	0.0	5.0	-	2.0	0.0	2.0	0.0	4.0	2.0	2.0	0.0	1.0	0.0
D14	3.0	4.0	2.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	2.0	0.0	4.0	4.0	2.0	0.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	0.0
x~	**2.6**	**2.9**	**1.8**	**0.6**	**1.7**	**0.9**	**2.4**	**4.3**	**1.3**	**0.6**	**1.4**	**0.6**	**4.8**	**4.4**	**1.8**	**0.2**	**2.1**	**0.2**	**3.9**	**4.0**	**1.9**	**0.3**	**1.9**	**0.3**
Sd	1.0	1.0	0.6	0.5	0.5	0.4	1.5	0.9	0.6	0.5	0.5	0.5	0.4	1.0	0.4	0.4	0.6	0.4	0.9	0.8	0.7	0.5	0.6	0.5

Table D 2

	wBing 2						wLa 3						wBing 3						wMan 3					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
D1	5.0	4.0	3.0	0.0	3.0	0.0	2.0	2.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	3.0	2.0	2.0	1.0	2.0	1.0
D2	5.0	5.0	3.0	0.0	2.0	0.0	4.0	3.0	2.0	0.0	2.0	1.0	2.0	4.0	1.0	1.0	2.0	1.0	2.0	4.0	1.0	0.0	3.0	1.0
D3	5.0	5.0	2.0	0.0	2.0	0.0	3.0	3.0	1.5	1.0	3.0	0.0	4.0	4.0	2.0	0.0	3.0	0.0	3.0	4.0	3.0	0.0	2.0	0.0
D4	4.0	4.0	2.0	0.0	2.0	0.0	3.0	3.0	2.0	1.0	2.0	1.0	3.0	4.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0
D5	4.0	3.0	2.0	0.0	1.0	1.0	3.0	3.0	1.5	1.0	3.0	1.0	2.0	3.0	1.0	1.0	2.0	1.0	3.0	3.0	2.0	0.0	2.0	1.0
D6	4.0	1.0	2.0	0.0	1.0	1.0	2.0	5.0	1.0	0.0	2.0	0.0	1.0	2.0	1.0	1.0	1.0	1.0	4.0	4.0	2.0	0.0	2.0	0.0
D7	4.0	4.0	1.0	1.0	1.0	1.0	4.0	2.0	3.0	0.0	2.0	1.0	4.0	5.0	3.0	1.0	3.0	1.0	3.0	4.0	3.0	1.0	2.0	1.0
D8	5.0	4.0	2.0	0.0	2.0	0.0	3.0	4.0	2.0	0.0	2.0	0.0	2.0	3.0	1.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	1.0	1.0
D9	4.0	4.0	2.0	0.0	2.0	0.0	4.0	2.0	2.0	1.0	2.0	1.0	3.0	4.0	1.0	1.0	3.0	0.0	2.0	3.0	1.0	0.0	2.0	0.0
D10	4.0	5.0	2.0	0.0	2.0	0.0	4.0	5.0	3.0	0.0	2.0	0.0	5.0	4.0	1.0	1.0	2.0	1.0	4.0	4.0	2.0	0.0	3.0	0.0
D11	5.0	5.0	2.0	0.0	2.0	0.0	4.0	4.0	2.0	0.0	1.0	1.0	5.0	4.0	1.0	1.0	2.0	0.0	3.0	4.0	3.0	0.0	2.0	0.0
D12	5.0	3.0	2.0	0.0	3.0	0.0	3.0	3.0	2.0	0.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0	1.0
D13	5.0	5.0	2.0	0.0	2.0	0.0	3.0	4.0	1.0	1.0	2.0	0.0	4.0	4.0	1.0	1.0	3.0	0.0	2.0	2.0	3.0	1.0	1.0	0.0
D14	4.0	4.0	2.0	0.0	2.0	1.0	4.0	4.0	2.0	0.0	2.0	1.0	3.0	4.0	1.0	1.0	2.0	1.0	3.0	4.0	2.0	1.0	2.0	1.0
x~	**4.5**	**4.0**	**2.1**	**0.1**	**1.9**	**0.3**	**3.3**	**3.4**	**1.9**	**0.4**	**2.1**	**0.6**	**3.0**	**3.5**	**1.4**	**0.9**	**2.1**	**0.7**	**2.8**	**3.4**	**2.1**	**0.5**	**2.0**	**0.6**
sd	0.5	1.1	0.5	0.3	0.6	0.3	0.7	1.0	0.6	0.5	0.5	0.5	1.3	1.0	0.6	0.3	0.7	0.5	0.9	0.8	0.7	0.5	0.6	0.5

Table D 3

	wLa 4						wLizhi 4						wNing 4						wMan 4					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
D1	1.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	1.0	1.0	2.0	1.0	1.0	3.0	2.0	1.0	2.0	1.0	3.0	2.0	2.0	1.0	2.0	1.0
D2	3.0	3.0	2.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	3.0	3.0	3.0	1.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0
D3	4.0	3.0	2.0	0.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	1.0	3.0	3.0	1.0	3.0	1.0	5.0	4.0	2.0	0.0	2.0	0.0
D4	2.0	3.0	1.0	1.0	2.0	1.0	2.0	3.0	1.0	0.0	2.0	1.0	3.0	3.0	3.0	1.0	2.0	1.0	4.0	3.0	2.0	0.0	2.0	1.0
D5	4.0	3.0	2.0	0.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	3.0	1.0	2.0	1.0	4.0	3.0	2.0	1.0	3.0	1.0
D6	2.0	4.0	2.0	1.0	3.0	0.0	1.0	5.0	1.0	0.0	2.0	0.0	2.0	2.0	1.0	1.0	1.0	1.0	5.0	5.0	2.0	0.0	2.0	0.0
D7	4.0	4.0	3.0	1.0	2.0	1.0	3.0	2.0	2.0	1.0	2.0	1.0	3.0	4.0	2.0	1.0	2.0	1.0	3.0	2.0	1.0	1.0	2.0	1.0
D8	1.0	4.0	2.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	2.0	1.0	1.0	3.0	1.0	1.0	3.0	1.0	4.0	3.0	1.0	1.0	2.0	1.0
D9	2.0	3.0	2.0	0.5	2.0	1.0	3.0	2.0	3.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	4.0	4.0	3.0	0.0	2.0	1.0
D10	3.0	2.0	2.0	1.0	2.0	1.0	3.0	2.0	1.0	1.0	2.0	1.0	1.0	3.0	1.0	1.0	2.0	1.0	4.0	2.0	2.0	0.0	1.0	1.0
D11	2.0	4.0	1.0	1.0	1.0	1.0	3.0	3.0	1.0	1.0	2.0	1.0	2.0	4.0	1.0	1.0	1.0	1.0	4.0	4.0	1.0	1.0	2.0	0.0
D12	3.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	1.0	1.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0	1.0	4.0	3.0	3.0	0.0	2.0	1.0
D13	4.0	2.0	2.0	0.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	3.0	1.0	0.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0
D14	3.0	3.0	2.0	1.0	2.0	1.0	3.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	1.0	1.0	2.0	1.0	4.0	4.0	1.0	1.0	2.0	1.0
x~	**2.7**	**3.1**	**1.9**	**0.8**	**1.9**	**0.9**	**2.3**	**2.9**	**1.4**	**0.9**	**1.9**	**0.9**	**1.8**	**3.0**	**1.8**	**0.9**	**1.8**	**1.0**	**3.7**	**3.1**	**1.7**	**0.6**	**1.9**	**0.8**
sd	1.1	0.7	0.5	0.4	0.5	0.3	0.8	0.9	0.6	0.4	0.4	0.3	0.8	0.6	0.9	0.3	0.7	0.0	0.9	1.0	0.7	0.5	0.5	0.4

Table D 4

	wLu 4						wDan 4					
Judges	**1**	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3a**	**3b**	**4a**	**4b**
D1	2.0	3.0	2.0	1.0	2.0	1.0	4.0	4.0	2.0	1.0	3.0	1.0
D2	3.0	3.0	2.0	1.0	2.0	1.0	4.0	4.0	3.0	1.0	2.0	1.0
D3	4.0	2.0	2.0	0.5	2.0	1.0	2.0	4.0	2.0	0.5	2.0	0.0
D4	2.0	3.0	1.0	0.0	2.0	1.0	4.0	3.0	2.0	1.0	2.0	1.0
D5	2.0	3.0	3.0	1.0	3.0	1.0	2.0	4.0	3.0	1.0	3.0	1.0
D6	2.0	2.0	3.0	0.0	2.0	1.0	1.0	3.0	2.0	1.0	3.0	0.0
D7	4.0	4.0	2.0	1.0	3.0	1.0	4.0	4.0	2.0	0.0	2.0	1.0
D8	4.0	4.0	1.0	0.0	3.0	1.0	4.0	4.0	2.0	0.0	2.0	0.0
D9	2.0	2.0	1.5	1.0	2.0	1.0	4.0	4.0	2.5	0.5	2.0	0.0
D10	1.0	3.0	3.0	0.0	2.0	1.0	3.0	4.0	3.0	1.0	3.0	0.0
D11	3.0	4.0	1.0	0.0	2.0	1.0	4.0	5.0	1.5	1.0	2.0	0.0
D12	2.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	3.0	1.0	2.0	0.0
D13	2.0	2.0	2.0	1.0	1.0	0.0	4.0	4.0	1.0	1.0	2.0	0.0
D14	3.0	4.0	2.0	0.0	2.0	1.0	4.0	4.0	2.0	1.0	2.0	1.0
x~	**2.6**	**3.0**	**2.0**	**0.5**	**2.1**	**0.9**	**3.3**	**3.9**	**2.2**	**0.8**	**2.3**	**0.4**
Sd	0.9	0.8	0.7	0.5	0.5	0.3	1.1	0.5	0.6	0.4	0.5	0.5

Table D 5

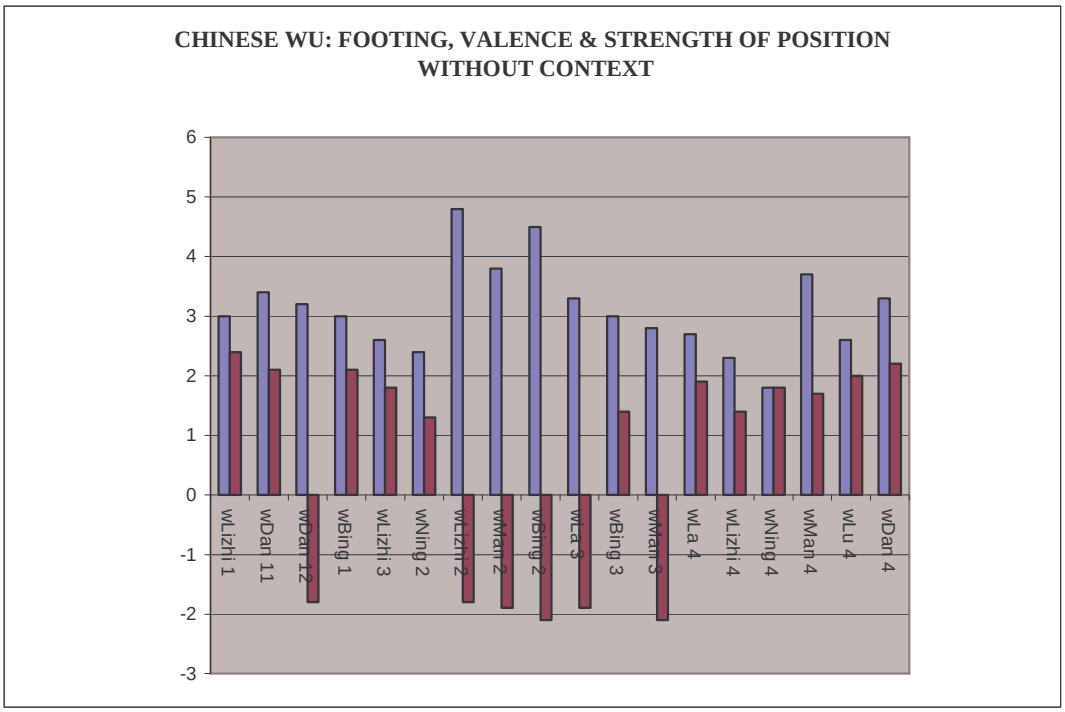

Fig. 7: Results for footing, valence and strength of position, based on Tables D1 to D5

Footing without context (**blue**): Col. 1, **(x~)**
Valence and Strength of Position without context (**red**): Col. 3a and 3b, **(x~)**

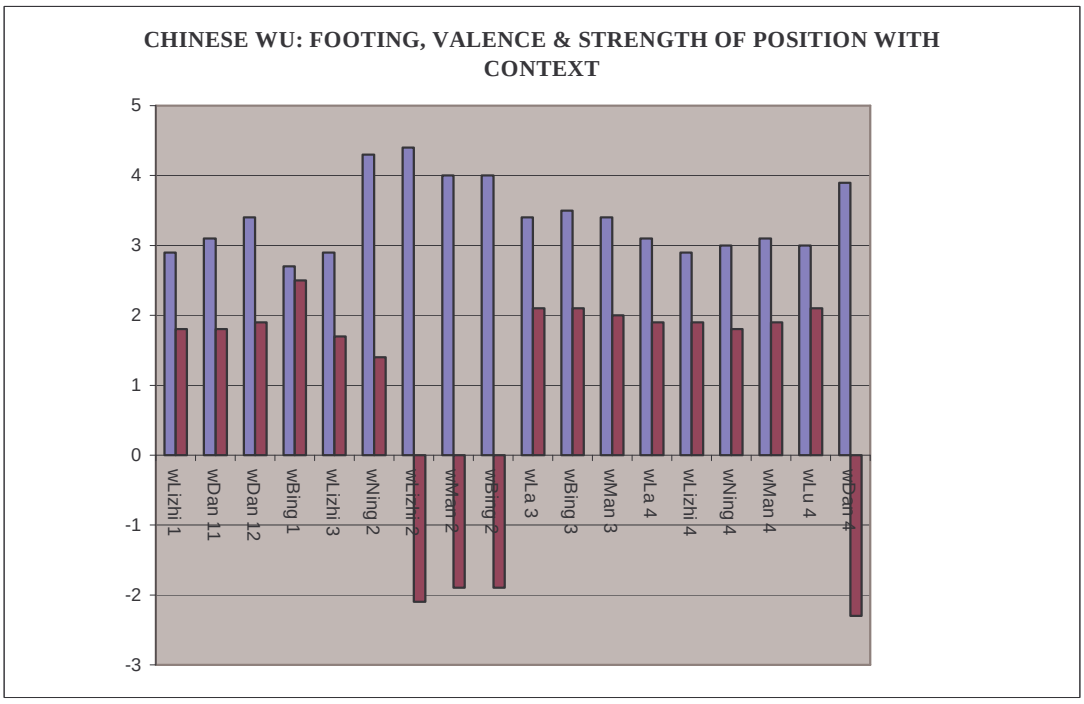

Fig. 8: Results for footing, valence and strength of position, based on Tables D1 to D5

Footing with context (**blue**): Col. 2, **(x~)**
Valence and Strength of Position with context (**red**): Col. 4a and 4b, **(x~)**

Appendix III

Complementary data relating to Chapters 8 and 9

1. The questionnaires used in the analytic listening tests (English translations)

1.1 The questionnaire for overall loudness, pitch, tempo and pause phenomena

Task 1:

(a) Please indicate the overall tempo of each utterance as a whole, in terms of either (very) fast, mid/normal or (very) slow.
(b) Please mark those parts of each utterance which in your opinion are markedly fast or slow as compared to the rest of the utterance.

Task 2:

(a) Please mark with the symbol '↑u ' any pauses and syllable lengthenings which you feel to be marked (unusual, unexpected) with respect to their position in the utterance.
(b) Please mark those pauses and lengthenings whose duration you feel to be unusually long, using the symbols '↑L' or '↑uL' (for pauses/lengthenings in normal and unusual position, respectively).

Task 3:

Now that you have familiarized yourself with the voice-range of the speaker and the loudness characteristic of her speech,

(a) Please indicate the overall loudness of each utterance as compared to that of the others, choosing between (very) loud, mid and (very) soft;
(b) In utterances containing strong variations in loudness indicate those sections which are markedly soft and/or markedly loud;

Task 4:

(a) Please indicate the overall pitch-height of each utterance as compared to the others, in terms of (very) high, mid or (very) low;
(b) In utterances marked by strong variations in pitch please indicate the pitch-variations occurring in each case, e.g. 'from high to mid' or 'from low to high'.

1.2 The questionnaire for phonatory and supralaryngeal voice quality

Task:

Choosing from the list of suggested *settings* given below, please indicate which phonatory and supralaryngeal voice qualities you can detect in the German and Chinese utterances you are about to hear.

List of suggested *settings* and their abbreviations:

Phonatory:
Whisper (WV)
Breathiness (Br V)
Laxness (LV)
Modal voice (MV)
Tenseness (TV)
Creak (CV)

Supralaryngeal:
Backed speech (BS)
Palatalization/fronted speech (FS)

2. The results of the phonetic microanalyses[1]

Introduction

In this section the results of the phonetic microanalysis, discussed in Chapters 8 and 9, are presented as follows: Tables A and B show the auditory and instrumental results obtained for phonatory voice quality and overall loudness, pitch, tempo and pause phenomena. Tables C and D list the instrumental results for intonation and supralaryngeal voice quality[2]. In this introduction each set of tables is presented briefly, together with the symbols and notation marks used in each case.

Table A The results for phonatory voice quality

The results obtained for voice quality are listed separately for each speaker in individual tabular sections for each speech sample. Each tabular section consists of 8 columns, the number of rows depending on the number of vowels examined in each case. Column 1 shows the German words and Chinese morphemes which were examined in the voice quality analysis. The German data are represented orthographically, the Chinese data with the *pin-yin* transliteration system[3], excluding the lexical tones. In polysyllabic German words the stressed vowels which were examined in the analysis are marked by underlining[4]. All verb endings appear in their full forms, excluding the reductions found in the German speech corpus, shown in Section 1 of Appendix I, and the German originals of the dialog passages, shown in Section 2 of Appendix 1. Exclamations and utterance-final particles are represented orthographically, *viz*. 'ah', 'oh'. Column 2 shows the vowels which were examined for each speech sample. The transcription of the German vowels is phonological and based on the Duden Aussprachewörterbuch (pronunciation dictionary). The transcription of the Chinese vowels is phonetic (in IPA), and follows the guidelines laid down in Section 1 of Appendix I, in the discussion of the *pin-yin* system. In diphthongs, only the vowel examined in each case is indicated[5]. Columns 3 and 4 list the results for frequency (in Hz) and closed quotient (*CQ*, in %), respectively. This is followed, in column 5, by the primary mode of phonation, determined on the basis of the data given in columns 3 and 4, and indicated in words, e.g. 'tense', 'modal/tense', 'modal', 'lax', 'modal/lax'[6]. In the absence of *laxness*, the results given in column 5 count as the final results and appear once more in column 8[7]. In those cases where the primary mode of phonation is indicated as *lax*, columns 6 and 7 list the results of the analyses aimed at determining the presence of *breathiness* in the speech signal. Column 6 indicates the presence/absence of spectral noise, determined with wideband spectrograms and indicated with the symbols '+' and '-'. Column 7 shows the intensity difference between the 1st and 2nd harmonics of the respective vowel, indicated in dB and serving in the instru-mental determination of *breathiness*[8]. The final results of the examinations are then indicated in column 8. In cases where an auditorily judged presence of *breathiness* could not be definitely clarified by instrumental means, the indication 'poss. breathy' appears.

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[1] The final results for all the examined suprasegmental phenomena are listed together in the suprasegmental profiles, shown in Table 10 towards the end of Chapter 8.

[2] As noted above in Chapters 8 and 9, in all cases the instrumental analyses of intonation and supralaryngeal voice quality confirmed and complemented the preceding auditory analyses of these features. Therefore, the instrumentally obtained results were taken as the final results of these analyses.

[3] See Appendix I, Section 1.

[4] In very long polysyllabic words only the examined syllables/morphemes appear in column 1.

[5] As observed in Chapter 8, these analyses could not be carried out for high close vowels, including those of diphthongs.

[6] As indicated in Chapter 8, Section 8.2, a CQ of ≤ 31.9% was taken to indicate *laxness*, a CQ of 32 - 33.9% as *modal/laxness*, a CQ of 34 - 37.9% as indicating *modalness*, a CQ of 38 - 40.9% as *modal/tenseness*, and a CQ of ≥ 41% was taken as indicative of *tenseness*.

[7] In cases where, due to disturbances in the laryngeal signal, such calculations of frequency and *CQ* could not be carried out, the symbol '-' appears in column 3 and 4, and the results given in columns 4 and 8 appear in brackets, indicating that they are based in the main on auditory analyses. In some cases, the presence/absence of *breathiness* could nevertheless be determined with the help of spectrograms.

[8] See discussion in Chapter 8, Section 8.2. As noted there, intensity differences above 12% indicate the presence of *breathiness*. In cases where the auditory impression of *breathiness* was very strong, values slightly below 12% were also taken as indicating this *setting*.

Table B The results for overall pitch, loudness, tempo and pause phenomena

The results for overall pitch, loudness, tempo and pause phenomena are also shown separately for each speaker and each individual speech sample. Each table begins with the German and Chinese speech sample examined in each case, shown phonologically and segmented into sections labeled with capital latters. As in Table A, the phonological transcription of the German utterances follows the Duden Aussprachewörterbuch and relates to the underlying phonological forms, so that once again colloquial reductions are excluded. Phonologically long syllables are marked with the symbol ' : ' and stressed syllables appear with the symbol ' ˈ ', for primary stress, ' ˌ ' for secondary stress. In affricates the two consonantal elements are linked with a tie bar ('‿') and in diphthongs the second vowel appears with a subscript arch, i.e. '◡'. As in Table A, the transcription of the Chinese utterances is in *pin-yin* and excludes the lexical tones. In combinations of two *pin-yin* symbols which represent one phonological unit, *viz*. /zh/, /ng/, /ao/, the second symbol is generally marked with a sub- or superscript arch, i.e. '◡' or '‿'. The exceptions here are /yi/ and /wu/, where the first symbols - the empty consonants /y/ and /w/ - are labeled in this fashion. In cases where the vowels /i/ and /u/ are used to represent *palatalization* and *labialization*, they are also marked in this way[9]. While utterance-initial exclamations are represented as 'a:' and 'o:', utterance-final particles are given without the lengthening symbols, *viz*. 'a', 'o', 'ma' etc.

The segmentation of the German and Chinese speech samples into sections, marked as A, B, C etc., served in the calculation of speech tempo, discussed in Chapters 8 and 9. In most cases, segmentation reflects the phonological structure of speech samples, in terms of their minor and major intonation groups. Stretches of speech containing long non-phonological (hesitation) pauses and/or lengthenings, however, were segmented a little differently: In order to minimize the distortions which such pause phenomena can incur, segmentation was carried out in such a way as to ensure that they occurred not within but between individual sections[10]. Accordingly, four different symbols had to be used to label the transitions between consecutive sections. In those cases where section boundaries coincide with intonation-group boundaries two symbols are possible: While a double vertical bar going through the horizontal line drawn below the utterance ('╫') signals the presence of the required phonological pause phenomena[11], a single vertical bar which stops at the horizontal line ('┴') is used in those cases where one or more of these phonological phenonomena is absent. At section boundaries not coinciding with intonation-group boundaries, the (expected and therefore unmarked) absence of pause phenomena is symbolized with a single vertical bar going through the horizontal line ('┼'), while the presence of an (unexpected and thus non-phonological) pause or lengthening at such a point is indicated with a double bar ending on the horizontal line ('╨').

Below the representation of the examined speech samples, the obtained results are shown in four tabular sections, relating to the results for pitch/frequency (1), loudness/intensity (2), tempo (3) and pauses/lengthenings (4). A fifth tabular section, giving the results for speech errors, appears in a few cases, and notes which follow below clarify/comment on individual calculations. The three first tabular sections contain three columns, showing the auditory results, the instrumental results and the evaluation of the instrumental results, respectively[12]. While the auditory data all relate to individual sections, indicated as A, B C etc.,[13] only the

[9] In *zemma* ('how') and *shemma* ('what'), from *zen* + *ma* and *shen* + *ma*, the second /m/ is also marked with a '◡' .

[10] In those cases where this was not possible and pauses were encountered within sections, their lengths were subtracted from the length of the respective section in calculations of tempo.

[11] At a major intonation-group boundary a pause preceded by utterance-final lengthening (slow-down) is the norm. The absence of such a pause may, however, be compensated for by a relatively stronger lengthening of the utterance-final syllable. At minor intonation-groups, only preboundary lengthening (slow-down) is expected.

[12] All instrumentally obtained data are rounded off, the results for tempo and length having one decimal point.

[13] Whenever all three auditory responses are identical, they are combined into one response, followed by the symbol 3/3. In all other cases, individual results are given separately, followed by the symbols 1/3 or 2/3, indicating the number of judges with this response.

instrumental results for tempo relate to sections. The results indicated for pitch/frequency and loudness/intensity - individual data separated by a trema ('–') in columns 1 and 2, and by a slash ('/') in column 3 - relate to each speech sample as a whole. The instrumentally obtained results for tempo are further divided into results per segment and per syllable. The results for utterance-final slow-down are included in column 2 of tabular section 3. They are given with small numbers, placed in brackets and preceded by the symbol 'x'.[14]

In tabular section (4), the results for pauses/lengthenings are shown in six columns. In the first three columns, each examined phenomenon is identified, in terms of its number (column 1), its type, in terms of pause or lengthening (in column 2), and its specific feature, in terms of empty, filled, absent etc. (column 3). In the case of filled pauses, lexical *fillers* are given in phonological brackets, sublexical *fillers* in square brackets. The same brackets are used to indicate the words/syllables on which lengthenings occur, also indicated in column 3. In the representation of the auditory results, shown in column 4, the following symbols are used: (1) For non-phonological pauses/lengthenings and phonological pause phenomena of overly long duration, the symbols '√ ' and 'x' are used to indicate the detection and non-detection of these phenomena in the listening tests. A capital 'L' indicates the auditory impression of long duration; (2) Phonological pause phenomena of unmarked duration, which the judges were not asked to comment on, are marked with the symbol '(√)'. (3) The absence of phonological pause phenomena which were examined instrumentally but also not included in the listening tests, are marked with '(-)'; (4) In cases where pauses are preceded by prepausal lengthening, the detection of the auditorily most prominent phenomenon, in most cases the pause, is indicated with the symbol '(√)', the less prominent phenomenon receiving the symbol '(-)'[15]. In column 5 the instrumental results are shown, using the symbols '√' and 'x' to indicate the presence and absence of the examined phenomena, the first symbol followed by the measured length, given in ms. Finally, the results of the evaluation of the instrumentally obtained data are given in column 6. With respect to phonological phenomena, these are either 'present' or 'absent', a capital 'L' or 'S' added, as appropriate, to indicate overly long or short duration. In those cases where the absence of a phonological pause phenomenon, as detected in the listening tests, could be confirmed instrumentally, the expression 'confirmed absent' appears. Coming now to non-phonological phenomena, these are either 'confirmed absent/present' or 'not confirmed present/absent', 'L' and 'S' again being added, as appropriate. In the determination of the relative length/duration of pause phenomena, the following procedure was adopted: Pauses with a measured length approximating the mean syllable length of the respective section were regarded as *normal*, while those with a length markedly above mean syllable length, i.e. about 1.5 times as long, were taken as *long pauses*, those with a length markedly below mean syllable length, i.e. approximating mean segment length, were regarded as *short*[16].

Table C - The results for intonation

The results for intonation, given in Table C, are also shown separately for each speaker and each individual speech sample. Each table consists of two parts. In the first part, the intonation-contour (pitch-contour) of each German or Chinese speech sample is shown inter-linearly[17], below which follows the corresponding text-tier. In the second part, the results of the

[14] As discussed in Chapters 8 and 9, utterance-final slow-down was calculated only for certain utterances of interest, i.e. whose auditory feeling suggested the presence of a marked type of final slow-down.

[15] As the judges were not asked to determine the presence of the two phenomena separately, it was often difficult to tell which had been detected in the listening tests. It was therefore presumed that they had perceived the suditorily more prominent phenomenon, in most cases the pause.

[16] Naturally, in all cases, final determination of the length, presence or absence of pause phenomena was based not only on the instrumentally obtained results but also took account of the auditory impression of the respective utterance.

[17] In this method of representation the top and bottom horizontal lines represent the top and bottom limits of the speaker's pitch-range. The dots (•) and marks (–) in the space between the two lines represent the pitch of each syllable, marks used for nuclear syllables, dots for

instrumental analyses are given, divided into two sections for the German speech samples and five sections for the Chinese speech samples. The notes which sometimes appear below these comment on individual calculations.

In the interlinear representation of the German intonation-contours, each speech sample is segmented into sections marked with capital letters, *viz.* A, B, C, corresponding to the nuclear and prenuclear segments. Three types of vertical lines are used to delimit these sections: A double vertical line signals the end of a speech sample, a single vertical line represents a major or minor intonation-group boundary and a broken vertical line marks the transition between a prenuclear and a nuclear segment. In those cases where the prehead is included in the analysis, a broken line is also used to separate it from the rest of the pre-nuclear segment. Finally, dash-dotted lines mark the presence of pauses, often in the vicinity of errors. The German utterances are given in orthographic script[18] and contain tonetic stress marks. Stressed syllables are in *italic* script and nuclear syllables are additionally marked by underlining. Tonetic stress marks, describing the configurations of prenuclear pitch-patterns and the types of nuclear pitch-patterns, appear immediately before *onset* and *nuclear* sylla-bles, respectively[19]. The marks used for the head, prehead and the nuclear pitch-patterns are listed below, in Tables 5 and 6[20]. Finally, the pitch/frequency of syllables of interest is indicated in Hz below the text-tier[21].

‘‘	for a high head	,	for a mid-low head	⇗	for glissando rising[22]
‘	for a mid-high head	,,	for a low head	⇘	for glissando falling
⊤	for a mid head			°	for a prehead

Table 5 Stress marks used for heads and preheads

¯	for a high level	`	for a high fall to mid	/	for a low rise to high	ˇ	for a high fall-rise
–	for a mid level	\	for a high fall to low	ˊ	for a mid rise to high	ˆ	for a high rise-fall
_	for a low level	ˎ	for a mid fall to low	´	for a mid-high rise to high	\/	for a low fall-rise
		ˏ	for a low fall			/\	for a low rise-fall

Table 6 Stress marks used in the description of the nuclear pitch-patterns

In the interlinear representation of the Chinese intonation-contours[23], each speech sample is also segmented into sections, three types of vertical lines being used to delimit them: While the end of each speech sample is marked with a double vertical line, adjacent (major and minor) intonation-groups are separated by single vertical lines[24], and broken vertical lines are used to separate last tone-units from the rest of the speech samples. Brief pauses are represented by one, longer pauses by two dotted vertical lines. Stepping brackets, i.e. _⌈ and ⌉_ , followed by small numbers and a ‘T’, relate to the final tonal behavior of utterances. Finally, small curved arrows (‘↱’ and ‘↴’) above the top line indicate the presence of up- and down-

other - stressed and non-stressed - syllables. The numbers plotted along the vertical line marking the beginning of each speech sample, indicate pitch (in Hz). For detailed discussions of the interlinear method of representing intonation, see Cruttenden 1986: xiii and Crystal 1987: 170 ff.

[18] In the orthographic representation of the German utterances, colloquial syllable reductions are included, placed between brackets.

[19] In most cases only the pitch-height of the head is indicated. Only the presence of glissando rises/falls are marked explicitly.

[20] The nuclear stress marks used in the tonetic approach are discussed in Cruttenden 1986: xiii f. The marks used here for the prenuclear sections are adapted from O’Connor & Arnold 1973

[21] Such syllables of interest are *onset* and *nuclear* syllables, and syllables on which changes of pitch-movements occur.

[22] The symbols for *glissando* are used together with a symbol for pitch-height

[23] The interlinear representation of the Chinese intonation-contours follows the same principles as discussed above for the German speech samples. While the pitch-heights of 1st and reduced contour tones are represented with dots, the pitch-patterns of non-reduced lexical tones are given a ‘tail’.

[24] While major and minor boundaries are not yet labelled separately here, the possible presence of a minor intonation-group boundary is discussed in each case in the Notes below the results for each speech sample. A single solid line is also used to mark interesting transitions between a topic and the rest of the utterance, as in *yMing 3*, *yLu 2* and *wMan 2.* These are also discussed in the Notes.

shifts in pitch. The representation of the Chinese utterances is in *pin-yin* and the lexical tone of each syllable is indicated in small raised numbers. The neutral tone, found mostly on grammatical and final particles, is indicated with a '0'[25]. Tonal changes due to *tone sandhi* are also included, with original and resulting tones separated by a slash ('/')[26]. The stressed syllables of each speech sample are given in *italic* script, focused syllables additionally marked by underlining. Finally, the pitch/frequency of each syllable is indicated in Hz below the text-tier. While one frequency is given for (level) 1st tones and reduced/neutralized contour tones (2nd, 3rd and 4th tones), with full, non-reduced, contour tones both the initial and the final frequency are indicated, also separated by a slash ('/ ').

The instrumental results obtained in the analysis of the German speech samples are shown in two tabular sections, relating to nuclear and prenuclear pitch-patterns. The 1st tabular section, showing the results for the *nuclei*, consists of five columns. In the first two, each nuclear syllable is identified in terms of the word (column 1) and section (column 2) in which it occurs. Following this, the nuclear type is indicated in column 3, further details, mostly relating to the tail-slope, being added in column 4. Finally, in column 5, the accent-range of each nuclear pitch-pattern is given, first in Hz, then in relative terms. The results for *heads* are given in 4 columns. In the first two, each *onset* syllable is identified, in terms of the word (column 1) and section (column 2) it occurs in. The configuration of each *head* then follows in column 3 and its pitch-range follows in column 4, again both in Hz and in relative terms[27]

The instrumental results obtained for Chinese intonation are shown in five sections, relating to declination, mean tonal band-width, final frequency/pitch-range, caudal tonal behavior and focal tonal behavior, in this order[28]. All results are given in Hz, tonal behavior also indicated in *tones* ('T')[29]. The data given for declination consist of the two morphemes (and their frequencies), on which calculations of declination were based, separated by a trema ('—') and followed by the result of their subtraction, in Hz. This number is then divided by the number of tone-units contained in the stretch of speech covered by the two morphemes, the result of this calculation corresponding to the final result for declination. The data given for mean tonal band-width consist of the two morphemes (and their frequencies) in each tone-unit for which calculations of this phenomenon were carried out. They are also separated by a trema and followed by the result of their subtraction, corresponding to the tonal band-width of each respective tone-unit. Towards the far right, the mean value of all the indicated tonal band-widths is given, corresponding to the final result for mean tonal band-width. In section 3, the tonal band-width of the final tone-unit is given in the same manner. Whenever changes of band-width occur, more than one calculation is made and all the results are given, separated by a slash ('/')[30].

In sections 4 and 5, showing the caudal and focal tonal behavior of the Chinese utterances, all the examined morphemes (and their frequencies) are indicated, separated by tremas and followed by the results of their subtractions, these corresponding to the final results for tonal

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[25] In cases where final particles possess genuine pitch-patterns of the kind discussed in Chapter 3 the '0' is omitted.

[26] In some cases, the results of *sandhi* changes are placed between brackets to indicate that the lexical tone in question seemingly adopts the pitch-pattern of the given second tone. This is often the case with the 2nd (rising) tone of tou^2 in man^2-tou^2 which to all appearances adopts the tonal characteristics of a 4th (falling) tone, especially in Wu's speech (e.g. in *wMan 4* and *wMan 3*). While this phenomenon is explainable in phonetic terms as a pitch transition from the 2nd tone of man^2 to the neutralized tone of tou°, the intensity of this 'transitional pitch-pattern' is such that it sounds like a genuine lexical tone.

[27] As noted above in Section 8.2. of Chapter 8, the following system was used in the determination of the relative range of *heads* and *nuclei*: Frequency values < 48 Hz were taken as narrow, values between 48 and 59 Hz as mid, values between 60 and 87 Hz were taken as mid-wide, values between 88 and 179 Hz as wide and frequency values > 180 were taken as very wide.

[28] These phenomena were determined following the methodology laid out in Chapter 8, Section 8.2.

[29] As noted in Chapter 8, the *tone*, corresponding to 20 Hz, was chosen as a more readily appreciable measure of tonal behavior than Hz.

[30] As noted briefly in Chapter 8, calculations of declination and tonal band-width were only possible in utterances, and tone-units, with a sufficient number of 3rd Tones (representing the *bottom line*) and 1st or 4th Tones (representing the *top line*). Whevever calculations are based on other tones, the obtained results, which count as approximate values, are marked with a ' *' and the symbols '≤ 'or '≥, as appropriate. See discussion in Chapter 8, Section 8.2.

behavior, given in Hz and in Tones[31]. The precise type of tonal behavior, given as *slope*, *fall*, *rise* or *overall fall/rise*, follows in brackets[32].

Table D - The results for supralaryngeal voice quality

The data given in Table D show the instrumental results for the ten German and Chinese speech samples which were examined with respect to their supralaryngeal voice quality - i.e. *palatalization* and *labiodentalization*. Each tabular section shows the results obtained for one speech sample, and consists of two columns and six rows. The first column shows the results obtained in the examination of the word/syllable judged auditorily to be affected by the *setting* in question, in the second column the results obtained in the examination of the comparative speech material are given. In row 1, the source of the examined speech material is identified, in terms of the speech sample (column 1) and the comparative material, also taken from the recordings but only occasionally from the German/Chinese speech corpus (column 2)[33]. In rows 2 and 4 of column 1, the examined vowels/consonants are indicated phonetically, their respective sources added in row 1 (morphemes given in phonological script/brackets, syllables in phonetic script/brackets). In rows 2 and 4 of column 2 the vowels and consonants with which these were compared are identified in the same manner. In rows 3 and 5, the formant/ energy maxima frequencies of the examined segments are given in Hz.[34] Finally, the final results of examinations are given in row 6, in terms of 'present' or 'not present'. The notes appearing below Table D comment on individual examinations and/or the presence of *delayed glottalization*, which was found in 4 speech samples.

[31] Results given in *tones* are rounded off to maximally one decimal point.

[32] While the term *slope* relates to the pitch-range covered by a given lexical tone, the terms *fall* and *rise* relate to the pitch-range lying between the (initial) pitch of consecutive tones. Finally, the terms overall rise/fall are used to describe the overall pitch-(range)patterns often traced by the initial pitch of consecutive tones. For a detailed discussion of final tonal behavior, regarded here as the manifestation of sentence intonation in Chinese is discussed in detail in Chapter 3. See also relevant passages in Chapter 8, in particular Section 8.2.

[33] In a few cases, the comparative material is taken from the German/Chinese speech corpus, in which case the respective speech sample is indicated.

[34] A question mark appears in those cases where results are inconclusive and/or measurements could not be carried out.

Table A: Results for phonatory voice quality (Clara):

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
cBlum 4	Results of auditory test: breathy; (whispery voice?) End: not breathy						
Blumen	[u]	207	38.8	modal/tense	+	(-)	modal/tense
habt	[a]	177	31.7	lax	+	14.65	breathy
ihr	[i]	210	36.8	modal	-	-	modal
vielleicht	[a]	177	31.7	lax	+	13.31	breathy
Papier-	[i]	246	33.9	modal/lax	+	(-)	modal/lax
blumen	[u]	266	33.3	modal/lax	-	-	modal/lax
cGans 1	Results of auditory test: Modal/ tense						
Gans	[a]	-	-	modal	-	-	modal
da	[a]	238	36.0	modal	-	-	modal
toll	[ɔ]	220	32.0	modal/lax	+	-	modal/lax
cKuli 1	Results of auditory test: Modal; "fast" & "noch": breathy						
fast	[a]	-	-	(lax)	+	15.49	breathy
hätte	[ɛ]	-	-	(lax)	+	12.43	breathy
Kuli	[u]	378	38.4	modal	-	-	modal
minen	[i]	305	37.0	modal(tense)	-	-	modal(tense)
brauche	[a]	-	-	(modal/lax)	-	-	(modal/lax)
noch	[ɔ]	183	32.5	modal/lax	-	-	modal/lax
cZwieb 3	Results of auditory test: Modal/a little breathy; end: tenser with rise in pitch						
Möchten	[ø]	272	30.0	lax	+	-	lax
da	[a]	253	31.0	lax	-	-	lax
vielleicht	[a]	246	33.9	modal/lax	+	-	modal/lax
Sommer-	[ɔ]	280	33.4	modal/lax	-	-	modal/lax
-zwiebeln	[i]	210	32.8	modal/lax	-	-	modal/lax
Zwie-	[i]	219	36.2	modal	-	-	modal
Grün	[y]	253	39.6	modal/tense	-	-	modal/tense
cMoon 1	Results of auditory test: Modal, end: tenser with rise in pitch						
Haben	[a]	171	36.5	modal	+	-	modal
Moon-	[u]	207	32.4	modal/lax	-	-	modal/lax
noch	[ɔ]	235	29.2	lax	+	-	lax
Kinder-	[I]	-	-	(lax)	-	-	(lax)
-größe	[ø]	332	34.1	modal	-	-	modal

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
cGans 4	Results of auditory test: breathy;"Nächstes" & "Gans": modal						
dann	[a]	235	32.7	modal/lax	+	12.07	breathy
habe	[a]	222	32.0	modal/lax	+	22.96	breathy
Nächstes	[ɛ]	185	33.9	modal	+	-	modal
Gans	[a]	191	34.7	modal	-	-	modal
cMoon 3	Results of auditory test: breathy;"Moon-" modal; "-boots": lax;						
Da	[a]	-	-	(lax)	+	19.75	breathy
haben	[a]	197Hz	25.8	lax	+	15.46	breathy
Moon-	[u]	262Hz	36.2	modal	-	-	modal
-boots	[u]	142Hz	29.4	lax	-	-	lax
cBlum 3	Results of auditory test: Modal; "Rosen" tenser with pitch rise						
Blumen	[u]	210Hz	34.3	modal	-	-	modal
haben	[a]	190Hz	28.9	lax	+	-	lax
hier	[i]	180Hz	25.0	lax	+	-	lax
Rosen	[o]	160Hz	29.5	modal/lax	-	-	modal/lax
cMango 3	Results of auditory test: Modal, end: breathy, "ne" : tenser						
glaube	[a]	-	-	(modal/lax)	-	-	(modal/lax)
Mango	[a]	238	32.9	modal/lax	-	-	lax
war	[a]	149	23.8	lax	-	-	lax
andere	[a]	152	22.8	lax	-	-	lax
ne	[ə]	198	27.1	lax	-	-	lax
cSchoko 3	Results of auditory test: "Ja": breathy; rest: lax						
Ja	[a]	-	-	(lax)	+	16.51	breathy
Schokolade	[a]	260Hz	24.7	lax	-	-	lax
Sahne-	[a]	160Hz	20.0	lax	-	-	lax
cBlum 1	Results of auditory test: Not breathy; modal; "Blumen" : tenser						
Und	[u]	215	29.8	lax	-	-	lax
ein	[a]	181Hz	35.2	modal	-	-	modal
Strauß	[a]	161Hz	29.8	modal/lax	-	-	modal/lax
Blumen	[u]	257Hz	39.4	modal/tense	-	-	modal/tense

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
cKuli 3	Results of auditory test: Modal; slightly tense (?)						
verkaufe	[a]	209	24.3	lax	+	-	lax
natürlich	[y]	188	32.9	modal	-	-	modal
gerne	[ɛ]	220	36.2	modal	-	-	modal
Kuli	[u]	185	29.4	lax	+	(-)	lax, poss. br.
cMango 2	Results of auditory test: Modal; end: breathy (?)						
haben	[a]	-	-	(modal/lax)	+	-	(modal/lax)
Bananen	[a]	213	39.5	modal/tense	-	-	modal/tense
Mangos	[a]	210	34.3	modal	-	-	modal
gekostet	[ɔ]	168	30.4	lax	-	-	lax
cMango 1	Results of auditory test: Modal/ tense						
kosten	[ɔ]	-	-	(modal/tense)	-	-	(modal/tense)
Mangos	[a]	350	48.5	tense	-	-	tense
würde	[y]	342	38.3	modal/tense	-	-	modal/tense
interessieren	[a]	258	37.8	modal(tense)	-	-	modal/(tense)
cBlut 4	Results of auditory test: breathy - "noch"; Rest: modal						
Dann	[a]	207	27.9	lax	+	14.79	breathy
brauche	[a]	196	30.0	lax	+	12.18	breathy
noch	[ɔ]	-	-	(lax)	+	17.14	breathy
unbedingt	[u]	290	34.6	modal	-	-	modal
Blutwurst	[u]	228	36.7	modal	-	-	modal
cSchoko 2	Results of auditory test: Modal, end: tenser with rise in pitch						
wollte	[ɔ]	217	32.1	modal/lax	-	-	modal/lax
Schokolade	[a]	232	33.7	modal/lax	-	-	modal/lax
Kuchen	[u]	319	37.5	modal(tense)	-	-	modal/(tense)
noch	[ɔ]	179	31.9	modal (lax)	-	-	modal/(lax)
cBlut 3	Results of auditory test: Modal						
schaun	[a]	230	32.7	modal/lax	-	-	modal/lax
hier	[i]	235	34.0	modal	+	(-)	modal
Blut-	[u]	283	39.3	modal/tense	-	-	modal/tense
-wurst	[u]	168	25.3	lax	-	-	lax

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
cKuli 2 Results of auditory test: lax/ breathy, end: tenser							
war	[a]	206	25.2	lax	-	-	lax
Angebot	[a]	228	30.35	modal/lax	-	-	modal/lax
gewesen	[e]	225	32.4	modal/lax	-	-	modal/lax
neun	[ɔ]	235	23.5	lax	+	13.0	breathy
zwanzig	[a]	302	31.8	modal/lax	-	-	modal/lax
Kuliminen	[u]	207	35.8	modal	-	-	modal
cVani 2 Results of auditory test: Modal							
hast	[a]	241	35.4	modal	-	-	modal
Vanillin-	[i]	238	35.7	modal	-	-	modal
vergessen	[ɛ]	160	40.0	modal/tense	-	-	modal/tense
cZwieb 2 Results of auditory test: Modal/ lax; after "Zwiebeln": laxer							
räumen	[ɔ]	243	37.7	Modal(tense)	-	-	modal/(tense)
erstmal	[ɛ]	181	35.3	modal	-	-	modal
Zwiebeln	[i]	205	38.1	modal/tense	-	-	modal/tense
Karotten	[ɔ]	197	30.0	lax	+	-	lax

Table A: Results for phonatory voice quality (Sybille):

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
sKuli 1 Results of auditory test: Modal							
Dann	[a]	-	-	(modal/lax)	-	-	(modal/lax)
bräuchte	[ɔ]	225	28.2	lax	-	-	lax
Kuli[1]-	[u]	357	35.7	modal	+	(-)	modal
meinen	[a]	200	27.8	lax	-	-	lax
Kuli[2]	[u]	232	27.6	lax	+	(-)	lax,poss. breathy
sMango 4 Results of auditory test: Modal; "hätt ich da": breathy							
Mango	[a]	188	30.2	lax	-	-	lax
schwierig	[i]	266	34.9	modal	-	-	modal
Papaja	[a]	275	32.2	modal/lax	+	-	modal/lax
hätte	[ɛ]	207	22.0	lax	+	-	lax
da	[a]	177	27.7	lax	-	-	lax
sMoon 1 Results of auditory test: Modal; from "Größe" : modal/lax							
Gut	[u]	242	27.3	lax	-	-	lax
nehme	[e]	250	32.3	modal/lax	-	-	modal/lax
Moon-	[u]	262	34.3	modal	-	-	modal
Größe	[ø]	212	28.6	lax	-	-	lax
-dreißig	[a]	168	28.5	lax	-	-	lax
sKiwi 4 Results of auditory test: (?) "brauchst": lax; "du": tenser							
Wieviel	[i]	271	34.2	modal	-	-	modal
Kiwis	[i]	295	33.4	modal/lax	+	(-)	modal/lax
brauchst	[a]	204	31.7	lax	+	12.3	breathy
Du	[u]	399	36.6	modal	-	-	modal
sBlum 3 Results of auditory test: Modal/ lax; "nicht da": breathy							
Blumen	[u]	228	35.6	modal	-	-	modal
Augen-	[a]	-	-	(modal/lax)	-	-	(modal/lax)
nicht	[i]	164	28.3	lax	+	(-)	lax,poss. breathy
da	[a]	146	29.7	lax	+	19.35	breathy

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
sKuli 4 Results of auditory test: Modal							
Da	[a]	253	28.7	lax	-	-	lax
sind	[ɪ]	235	26.8	lax	-	(-)	lax
Kuli-	[u]	-	-	(modal/lax)	+	(-)	(modal/lax)
-minen	[i]	187	33.3	modal/lax	-	-	modal/lax
sKiwi 3 Results of auditory test: tense—modal							
Kiwis	[i]	232	36.1	modal	+	(-)	modal
auch	[a]	186	29.3	lax	-	-	lax
da	[a]	172	31.1	modal/lax	-	-	modal/lax
sKiwi 1 Results of auditory test: Modal—laxer							
Ja	[a]	242Hz	37.7	modal	-	-	modal
drei	[a]	188	36.5	modal	-	-	modal
Stück	[y]	194	36.6	modal	-	-	modal
Kiwis	[i]	225	33.7	modal/lax	+	(-)	modal/lax
bitte	[ɪ]	163	26.5	lax	-	-	lax
sKiwi 2 Results of auditory test: Modal; End: (tenser?)							
Wieviel	[i]	246	35.5	modal	-	-	modal
Kiwis	[i]	319	32.1	modal	+	(-)	modal
geholt	[o]	326	35.6	modal	+	-	modal
sagst	[a]	-	-	(modal/ tense)	-	-	(modal/tense)
du	[u]	-	-	(modal/ tense)	-	-	(modal/tense)
sMango 3 Results of auditory test: Modal/ a little lax(?); end: breathy							
Mangos	[a]	225	35.1	modal	-	-	modal
Augen	[a]	237	39.1	modal/ tense	-	-	modal/tense
nicht[1]	[ɪ]	246	35.5	modal	-	-	modal
nicht[2]	[ɪ]	197	35.7	modal	-	-	modal
Jahres-	[a]	165	36.0	modal	-	-	modal
dafür	[y]	172	33.0	modal/lax	+	(-)	modal/lax
sSchoko 1 Results of auditory test: Modal; "Schokolade": laxer (?)							
kostet	[ɔ]	347	34.7	modal	+	-	modal
da	[a]	-	-	(modal/lax)	-	-	(modal/lax)
Tafel	[a]	232	23.2	lax	+	12.66	breathy
Schokolade	[a]	173	28.3	lax	-	-	lax

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
sGans 1	Results of auditory test: Tense; "kann ich" & "haben": breathy (?)						
Kann	[a]	210	29.2	lax	+	-	lax
dann	[a]	232	29.0	lax	-	-	lax
morgen	[ɔ]	200	37.0	modal	-	-	modal
Gans	[a]	202	34.5	modal	-	-	modal
haben	[a]	280	26.4	lax	+	-	lax
sBlum 1	Results of auditory test: Modal						
Strauß	[a]	197	32.9	modal/lax	-	-	modal/lax
Blumen	[u]	259	38.1	modal/ tense	-	-	modal/tense
bräuchte	[ɔ]	202	35.4	modal	-	-	modal
noch	[ɔ]	192	26.7	lax	-	-	lax
sMoon 2	Results of auditory test: Modal; "da": laxer (?)						
Waren	[a]	240	32.3	modal/lax	-	-	modal/lax
ihrer	[i]	242	34.2	modal	-	-	modal
Größe	[ø]	246	35.5	modal	-	-	modal
Moon-	[u]	250	37.5	modal	-	-	modal
da	[a]	246	21.7	lax	+	13.06	breathy
sBlum 2	Results of auditory test: Modal/tense (?)						
Blumen[1]	[u]	210	32.2	modal/lax	-	-	modal/lax
Blumen[2]	[u]	307	36.6	modal	-	-	modal
mitgebracht	[ɪ]	385	38.0	modal/ tense	-	-	modal/tense
sSchoko 3	Results of auditory test: Modal. "denn": laxer						
Welche	[ɛ]	-	-	(modal)	-	-	(modal)
Schokolade	[a]	207	37.6	modal	-	-	modal
wollten	[ɔ]	200	32.3	modal/lax	-	-	modal/lax
denn	[ɛ]	177	33.3	modal/lax	-	-	modal/lax
sSchoko 4	Results of auditory test: Modal—breathy						
Welche	[ɛ]	222	32.1	modal/lax	-	-	modal/lax
Schokolade	[a]	215	29.8	lax	-	-	lax
soll	[ɔ]	204	30.7	modal/lax	-	-	modal/lax
sein	[a]	232	27.6	lax	-	-	lax

Table A: Results for phonatory voice quality (You):

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
yLong 3	Results of auditory test: beg.: breathy;"Long"&"gong-jing": laxer;"xia": tenser						
Hao	[a]	166	22.1	lax	+	12.9	breathy
ba	[a]	225	26.7	lax	+	11.9	breathy
ya̲o	[a]	181	31.9	modal/lax	-	-	modal/lax
gong	[ʊ]	246	29.3	lax	-	-	lax
long-	[ʊ]	183	31.0	modal/lax	-	-	modal/lax
-xia̲	[a]	222	38.5	modal/ tense	+	-	modal/tense
yLu 3	Results of auditory test: beg.: breathy; rest: modal/tense						
Hao	[a]	192	25.4	lax	+	13.7	breathy
Na	[a]	271	32.3	lax	+	12.8	breathy
ya̲o	[a]	183	33.7	lax	+	11.7	breathy
ban	[æ]	290	41.1	tense	-	-	tense
gong	[ʊ]	228	34.8	modal	-	-	modal
jing	[i]	202	34.2	modal	-	-	modal
ro̲u	[ə]	202	32.5	modal/lax	-	-	modal/lax
yLizhi 4	Results of auditory test: "ah:" lax; Rest: rather tense						
Ah	[a]	207	32.2	modal/lax	+	-	modal/lax
li-	[i]	306	43.0	tense	-	-	tense
-zai	[a]	257	54.9	tense	-	-	tense
jing	[i]	253	35.0	modal	-	-	modal
shang	[a]	282	43.8	tense	-	-	tense
shi	[ɨ]	244	46.0	tense	-	-	tense
yBing 4	Results of auditory test: Modal/ tense—laxer						
ya̲o	[a]	280	54.5	tense	-	-	tense
kou-	[ə]	171	26.1	lax	+	-	lax
-wei	[e]	213	43.9	tense	-	-	tense
bing	[i]	-	-	(lax/breathy)	+	(-)	(lax,poss. breathy)
ling	[i]	-	-	(lax/breathy)	+	(-)	(lax,poss. breathy)

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
yMing 3	Results of auditory test: Modal—a little tenser						
Ming	[i]	202	35.0	modal	-	-	modal
wo	[ɔ]	155	32.7	modal/lax	-	-	modal/lax
-yao	[a]	271	37.9	modal/ (tense)	-	-	modal/(tense)
yi	[i]	170	37.3	modal	-	-	modal
fen	[ə]	271	37.9	modal/ (tense)	-	-	modal/(tense)
yMan 3	Results of auditory test:"hao": breathy;"bai-man-tou": br. rest: Modal/ (tense?)						
Hao	[a]	158	27.7	lax	+	-	lax
Na	[a]	253	37.9	modal/(tense)	-	-	modal/(tense)
yao	[a]	235	32.8	modal/lax	-	-	modal/lax
wu	[u]	173	34.0	modal	-	-	modal
ge	[ə]	197	32.9	modal/lax	-	-	modal/lax
bai-	[a]	173	33.7	modal/lax	-	-	modal/lax
-man-	[æ]	171	29.4	lax	+	11.8	breathy
-tou	[ə]	152	27.6	lax	+	-	lax
yLing 1	Results of auditory test: Modal/ lax; at times tenser						
-zai	[a]	290	38.4	modal/ tense	-	-	modal/ tense
ling-	[i]	232	34.8	modal	-	-	modal
-meng	[ə]	235	33.8	modal/lax	-	-	modal/lax
gong	[ʊ]	280	38.7	modal/ tense	-	-	modal/tense
-er	[ə]	213	34.8	modal	-	-	modal
ma-	[a]	136	27.2	lax	+	-	lax
-ke	[ə]	194	33.7	modal/lax	+	-	modal/lax
yLizhi 1	Results of auditory test: Tense—laxer						
Na	[a]	266	45.0	tense	-	-	tense
jien-	[ɛ]	295	42.6	tense	-	-	tense
nin	[i]	238	41.7	tense	-	-	tense
li	[i]	260	39.0	modal/ tense	-	-	modal/tense
zemma	[ə]	153	30.7	lax	-	-	lax
yang	[a]	159	32.8	modal/lax	-	-	modal/lax

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
yDang 1	Results of auditory test: Modal/ tense						
Xin^{1}	[i]	371	44.2	tense	-	-	tense
Xin^{2}	[i]	262	36.2	modal	-	-	modal
Dang^{1}	[a]	238	40.3	tense	-	-	tense
xin^{3}	[i]	246	38.5	modal/ tense	-	-	modal/tense
zai	[a]	280	40.4	tense	-	-	tense
dang^{2}-	[a]	254	42.8	tense	-	-	tense
-ji	[i]	195	39.1	modal/ tense	-	-	modal/tense
yMan 2	Results of auditory test: tense						
Ming-	[i]	200	34.6	modal	-	-	modal
za̲o-	[a]	207	37.9	modal/ (tense)	-	-	modal/(tense)
man-	[æ]	170	34.6	modal	-	-	modal
-tou	[ə]	180	34.4	modal	-	-	modal
you	[ə]	175	34.0	modal	-	-	modal
mai	[a]	115	31.5	modal	-	-	modal
yLong 2	Results of auditory test: Modal/ (tense?)						
Ni	[i]	225	34.4	modal	-	-	modal
wei	[e]	280	40.4	tense	-	-	tense
ya̲o	[a]	253	38.0	modal/ tense	-	-	modal/tense
mai	[a]	195	46.5	tense	-	-	tense
long-	[ʊ]	163	38.8	modal/ tense	-	-	modal/tense
-xia̲	[a]	189	39.2	modal/ tense	-	-	modal/tense
yLizhi 2	Results of auditory test: tense						
kan	[æ]	313	43.3	tense	-	-	tense
xia̲^{1}	[a]	271	38.4	modal/ tense	+	-	modal/tense
dui̲	[e]	290	41.8	tense	-	-	tense
xia̲^{2}	[a]	262	40.2	tense	-	-	tense
li-	[i]	313	38.9	modal/ tense	-	-	modal/tense
duo̲	[ɔ]	275	34.4	modal	-	-	modal
qia̲n	[ɛ]	165	33.9	modal (lax)	-	-	modal/(lax)

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
yLu 2	Results of auditory test: Modal/ a little tense						
hou	[ə]	266	38.1	modal/ tense	-	-	modal/tense
lu-	[u]	194	31.8	modal	-	-	modal
-rou	[ə]	207	38.6	modal/ tense	-	-	modal/tense
duo	[ɔ]	225	38.1	modal/ tense	-	-	modal/tense
qian	[ɛ]	148	30.5	modal/lax	+	-	modal/lax
yLing 2	**Results of auditory test: beg.: Tense—Modal; end: laxer**						
zhei	[e]	307	46.1	tense	-	-	tense
ge	[ə]	222	37.9	modal/ (tense)	-	-	modal/(tense)
ling	[i]	222	36.2	modal	-	-	modal
zher	[ə]	242	40.9	tense	-	-	tense
mai	[a]	192	37.8	modal/ (tense)	-	-	modal/(tense)
duo	[ɔ]	207	39.1	modal/ tense	-	-	modal/tense
gong	[ʊ]	170	34.5	modal	-	-	modal
ah	[a]	121	33.6	modal/lax	-	-	modal/lax
yLong 1	Results of auditory test: Modal						
Long-	[ʊ]	153	34.6	modal	-	-	modal
-xia	[a]	285	42.8	tense	-	-	tense
gong-	[ʊ]	255	42.9	tense	-	-	tense
cai	[a]	171	37.4	modal	+	-	modal
-er	[ə]	262	42.8	tense	-	-	tense
ma-	[a]	145	34.6	modal	-	-	modal
-ke	[ə]	190	38.1	modal/ tense	-	-	modal/tense
yLa 2	Results of auditory test: Tense						
la^{1}	[a]	295	38.2	modal/ tense	-	-	modal/tense
jiao^{1}	[a]	271	39.0	modal/ tense	-	-	modal/tense
ne	[ə]	257	45.1	tense	-	-	tense
jin-	[i]	275	38.1	modal/ tense	-	-	modal/tense
la^{2}	[a]	250	34.5	modal	-	-	modal
jiao^{2}	[a]	242	42.4	tense	-	-	tense
mai^{1}	[a]	165	34.9	modal	-	-	modal
mai^{2}	[a]	156	34.4	modal	-	-	modal
la^{3}	[a]	197	38.7	modal/ tense	-	-	modal/tense
jiao^{3}	[a]	164	38.6	modal/ tense	-	-	modal/tense

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
yMan 1 Results of auditory test: Modal/lax							
Nin	[i]	219	35.7	modal	-	-	modal
cang[1]	[a]	250	34.5	modal	+	-	modal
cang[2]	[a]	262	39.4	tense	+	-	tense
man[1]-	[æ]	219	46.7	tense	-	-	tense
-tou	[ə]	262	34.3	modal	+	-	modal
man[2]	[æ]	213	38.1	modal (tense)	-	-	modal/(tense)
ming	[i]	157	32.8	modal/lax	-	-	modal/lax
de	[ə]	210	33.4	modal/lax	-	-	modal/lax
yMing 1 Results of auditory test: Modal/lax; "ah": breathy							
Zhong-	[ʊ]	337	40.3	tense	-	-	tense
-jie	[e]	213	40.1	tense	-	-	tense
dao	[a]	285	35.7	modal	-	-	modal
Ni	[i]	271	28.7	modal/lax	-	-	modal/lax
-yao	[a]	285	39.4	modal/ tense	-	-	modal/tense
dian	[ɛ]	215	35.2	modal	-	-	modal
ming-	[i]	181	34.2	modal	-	-	modal
ah	[a]	179	30.3	lax	+	13.8	breathy
yLong 4 Results of auditory test: Modal/ tense; "hen pien-yi" laxer							
Long-	[ʊ]	213	41.4	tense	-	-	tense
ah[1]	[a]	253	44.4	tense	-	-	tense
ah[2]	[a]	210	39.6	modal/ tense	-	-	modal/tense
zai	[a]	290	47.4	tense	-	-	tense
pian-	[ɛ]	-	-	(modal/lax)	+	(-)	(modal/lax)
-yi	[i]	-	-	modal/lax	-	-	modal/lax
oh	[ɔ]	220	39.5	modal/ tense	-	-	modal/tense

Table A: Results for phonatory voice quality (Wu):

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
wLizhi 3 Resultsof auditory test: Modal/lax;"li-zhi": tenser							
ni	[i]	-	-	(modal/lax)	-	-	(modal/lax)
you[1]	[ə]	215	35.2	modal	-	-	modal
you[2]	[ə]	212	32.4	modal/lax	-	-	modal/lax
long	[ʊ]	233	33.4	modal/lax	-	-	modal/lax
li	[i]	-	-	(modal/ tense)	-	-	(modal/tense)
ho	[ɔ]	179	31.4	lax	+	15.6	breathy
wBing 1 Results of auditory test: Modal/ tense; laxer in middle							
Wo	[ɔ]	-	-	(modal/ tense)	-	-	(modal/tense)
yi	[i]	-	-	(modal/ tense)	-	-	(modal/tense)
-er	[ə]	-	-	(modal/ tense)	-	-	(modal/tense)
Ta	[a]	-	-	(lax)	+	18.2	breathy
xiang	[a]	-	-	(lax)	+	-	(lax)
tang-	[a]	-	-	(modal)	-	-	(modal)
bing-	[i]	-	-	(modal/ tense)	-	-	(modal/tense)
-ling	[i]	-	-	(modal/ tense)	-	-	(modal/tense)
wLizhi 1 Results of auditory test: Tense; from "ning-meng": laxer							
-wai	[a]	-	-	(tense/ modal)	-	-	(tense/modal)
zai	[a]	-	-	(modal)	-	-	(modal)
mai	[a]	-	-	(modal/ tense)	-	-	(modal/tense)
ning-	[i]	-	-	(modal/lax)	-	-	(modal/lax)
-meng	[ə]	-	-	(modal/lax)	-	-	(modal/lax)
li-	[i]	-	-	(modal)	-	-	(modal)
long-	[ʊ]	-	-	(modal/lax)	-	-	(lax)
wBing 2 Results of auditory test: Tense							
Bing-	[i]	-	-	(tense)	-	-	(tense)
-ling	[i]	-	-	(tense)	-	-	(tense)
wang	[a]	-	-	(tense)	-	-	(tense)
mei	[e]	-	-	(tense)	-	-	(tense)
ah	[a]	-	-	(modal/ tense)	-	-	(modal/tense)

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
wMan 2	Results of auditory test: breathy; from "xian-cheng": modal						
Ei-yo	[e]	175	21.9	lax	-	(-)	lax
xi̲an	[ɛ]	238	28.4	lax	+	(-)	lax, poss. breathy
man-	[æ]	172	32.3	modal/lax	-	-	modal/lax
mai	[a]	152	34.7	modal	-	-	modal
pa	[a]	205	29.4	modal/lax	+	-	modal/lax
gan-	[æ]	275	36.0	modal	-	-	modal
-jing	[i]	319	39.6	modal/ tense	-	-	modal/tense
ba	[a]	157	30.2	modal/lax	-	-	modal/lax
wLa 3	Results of auditory test: Modal						
Ni	[i]	-	-	(modal/ tense)	-	-	(modal/tense)
la^{1}-	[a]	-	-	(modal/ tense)	-	-	(modal/tense)
la^{2}	[a]	326	33.8	modal/lax	-	-	modal/lax
ma	[a]	295	32.3	modal/lax	-	-	modal/lax
wLizhi 2	Results of auditory test: Tense						
yo̲u^{1}	[ə]	455	45.0	tense	-	-	tense
mai	[a]	347	35.6	modal	-	-	modal
li-	[i]	469	44.1	tense	-	-	tense
yo̲u^{2}	[ə]	462	44.3	tense	-	-	tense
long-	[ʊ]	329	44.0	tense	-	-	tense
gan	[æ]	469	42.7	tense	-	-	tense
yah	[a]	257	42.0	tense	-	-	tense
wBing 3	Results of auditory test: lax (breathy?)						
Ah	[a]	302	32.2	modal/lax	-	-	modal/lax
ji̲u	[ə]	295	27.8	lax	+	-	lax
-hu̲an	[æ]	215	26.9	lax	+	-	lax
ning-	[i]	204	25.6	lax	+	(-)	lax, poss. breathy
-meng	[ə]	213	27.9	lax	+	14.3	breathy
bing-	[i]	200	32.6	modal/lax	-	-	modal/lax
-ling	[i]	172	27.9	lax	-	-	lax

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
wNing 2 Results of auditory test: Tense							
Eiyo	[e]	295	46.6	tense	-	-	tense
mai	[a]	250	40.7	tense	-	-	tense
ning-	[i]	281	38.4	modal/ tense	-	-	modal/tense
-meng	[ə]	319	46.0	tense	-	-	tense
wMan 3 Results of auditory test: Er: breathy/lax, "Man-tou": tenser,then laxer again							
Er	[ə]	235	26.5	lax	+	11.7	breathy
man^{1}-	[æ]	262	43.5	tense	-	-	tense
-t<u>o</u>u^{1}	[ə]	285	35.7	modal	+	-	modal
y<u>o</u>u	[ə]	400	36.9	modal	-	-	modal
man^{2}	[æ]	183	32.9	modal/lax	-	-	modal/lax
t<u>o</u>u^{2}	[ə]	302	30.2	lax	+	-	lax
wNing 4 Results of auditory test: Increasingly breathy							
Mai	[a]	-	-	(modal)	-	-	(modal)
ning-	[i]	-	-	(lax)	-	-	(lax)
-meng	[ə]	-	-	(lax)	-	-	(lax)
pao	[a]	-	-	(lax)	+	18.0	breathy
cha	[a]	-	-	(lax)	+	21.0	breathy
he	[ə]	-	-	(lax)	+	14.0	breathy
wDan 4 Results of auditory test:Beg.:Modal;from "zhu-tang":breathy							
-dan	[æ]	-	-	(modal/tense)	-	-	(modal/tense)
tang	[a]	-	-	(lax)	+	25.6	breathy
tai	[a]	-	-	(lax)	+	20.8	breathy
hao	[a]	-	-	(lax)	+	14.7	breathy
ba	[a]	-	-	(lax)	+	12.1	breathy

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
wDan 12	Results of auditory test: Modal; "ya-dan": tense "zhong-jian": lax						
Jie-	[e]	-	-	(modal/lax)	-	-	(modal/lax)
ji-	[i]	326	34.8	modal	-	-	modal
-dan[1]	[æ]	-	-	(modal/ tense)	-	-	(modal/tense)
ya-	[a]	-	-	(modal/ tense)	-	-	(modal/tense)
dan[2]	[æ]	-	-	(lax)	+	19.4	breathy
zhong-	[ʊ]	-	-	(lax)	+	-	(lax)
-jian	[ɛ]	-	-	(lax)	+	-	(lax)
wDan 11	Results of auditory test: Modal; "oh": breathy						
Oh	[ɔ]	-	-	(modal/lax)	+	13.4	breathy
-dan	[æ]	-	-	(modal/ tense)	-	-	(modal/tense)
hao	[a]	-	-	(modal/ tense)	-	-	(modal/tense)
chi	[ɨ]	-	-	(modal)	-	-	(modal)
ma	[a]	-	-	(modal/lax)	+	14.7	breathy
wLu 4	Results of auditory test: lax—breathy; "mai": tenser						
Wo	[ɔ]	-	-	(modal/lax)	-	-	(modal/lax)
mai	[a]	-	-	(modal)	-	-	(modal)
gong-	[ʊ]	-	-	(lax)	-	-	(lax)
lu-	[u]	-	-	(lax)	-	-	(lax)
-rou	[ə]	-	-	(lax)	-	-	(lax)
ba	[a]	-	-	(lax)	+	25.5	breathy
wLizhi 4	Results of auditory test: Ah[1]: modal. Rest: breathy						
Ah	[a]	-	-	(modal/ tense)	-	-	(modal/tense)
li[1]-	[i]	-	-	(modal/lax)	+	(-)	(modal/lax) (poss.breathy)
dui	[e]	-	-	(lax)	+	29.3	breathy
li[2]-	[i]	-	-	(modal/lax)	-	-	(modal/lax)
long-	[ʊ]	-	-	(modal/lax)	-	-	(modal/lax)
-yen	[ɛ]	-	-	(lax)	+	(-)	(lax) (poss. breathy)
ah	[a]	-	-	(lax)	+	22.6	breathy

Word/ morpheme	examined vowel	Freg. (Hz)	CQ (%)	Phonation mode	Presence of spectral noise	Intensity difference 1st & 2nd harmonics (dB)	Voice Quality
wLa 4	**Results of auditory test: Tense on "la-jiao"; modal/lax—breathy**						
La[1]	[a]	-	-	(tense)	-	-	(tense)
jia̲o[1]	[a]	-	-	(modal/lax)	-	-	(modal/lax)
ba	[a]	-	-	(lax)	+	21.0	breathy
dui̲	[ɛ]	-	-	(modal/ tense)	-	-	(modal/tense)
wo	[ɔ]	-	-	(modal/lax)	-	-	(modal/lax)
-hua̲n	[æ]	-	-	(lax)	+	19.8	breathy
la[2]	[a]	-	-	(lax)	+	22.3	breathy
jia̲o[2]	[a]	-	-	(lax)	+	24.7	breathy
wMan 4	Results of auditory test: Modal/tense—breathy						
Man[1]-	[æ]	-	-	(modal/ tense)	-	-	(modal/tense)
-to̲u[1]	[ə]	-	-	(modal/ tense)	-	-	(modal/tense)
man[2]-	[æ]	-	-	(modal/lax)	+	12.8	breathy
-to̲u[2]	[ə]	-	-	(lax)	+	-	(lax)
zuo̲	[ɔ]	-	-	(lax)	-	-	(lax)
hao-	[a]	-	-	(lax)	+	-	(lax)
man[3]-	[æ]	-	-	(lax)	+	18.1	breathy
-to̲u[3]	[ə]	-	-	(lax)	+	17.3	breathy
ma	[a]	-	-	(lax)	+	23.6	breathy

Table B: Results for overall pitch/frequency, loudness/intensity, tempo and pauses/ lengthenings (Clara):

(1) cBlum 4

①

ˈbluːmən	hapt iːɐ fiˈlaɪ̯̊çt zoː	paˈpiːɐ̯ˌbluːmən
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instrumental results
A: low/mid (3/3)	211—163	
B: low/mid (3/3)	160—214—162	mid-low/high
C: higher (3/3)	280—246	

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instrumental results
A → C: soft (3/3)	48—62—68	soft/mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instrumental results
	ms/segment	ms/syllable	
A: mid (3/3)	68.1	204.5	mid
B: mid (3/3)	70.3	196.8	mid
C: slow (3/3)	107.8 x (1.5)	296.5	slow

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	filled [h]	(√)	√ Length: 250.0 ms	present

(2) cMoon 1

① ②		③
ˈhaːbn̩ ziː diː	ˈmuːnbuːt̪s nɔx ɪn deːɐ	ˈkɪndɐgrøːsə
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A: high/mid (3/3)	170—494	
B: mid (3/3)	208—239	mid/high/v. high
C: high/v. high (3/3)	252—430	

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid (2/3); soft (1/3)	63—56	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: mid (2/3)	A: 98.6	197.3	mid
mid — fast (1/3)	B: 69.9	195.8	mid
	C: 78.0 $_{x\,(1.1\,)}$	195.0	mid

4. Pauses/Lengthenings

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	filled |diː|	√ (1/3)	√ Length: 325.0 ms	conf. present
2	Pause	empty	√ (3/3)	√ Length: 45.0 ms	conf. present

(3) cKuli 1

②	①	③
ax ʊnt vas ɪç fast fɛɐˈgɛsn̩ ˈhɛtɛ	ʁu:liˌmi:nen ˈbraʊ̯xə ɪç nɔx	
A	B	

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A: mid (3/3)	240—195	mid-high/v. high/mid-low
B: high — mid (3/3)	386—182	

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (2/3)	67—63—73—61	mid
mid —loud —mid (1/3)		

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A: slow/mid	71.0	177.4	mid
B: slow	106.8	274.9	slow

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	(√)	√ Length: 156.6 ms	present

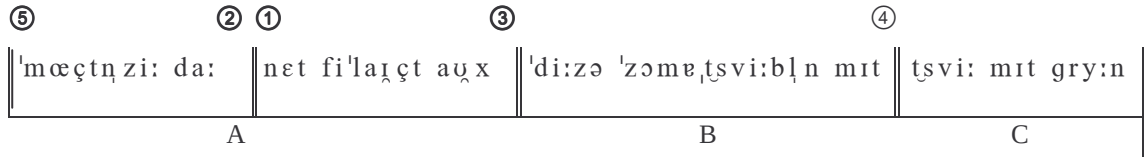
b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
2	Pause	empty	√ (2/3)	√ Length: 150.0 ms	conf. present
3	Pause	empty	√ (1/3)	×	not conf. present

Notes:

(1) To ①: The measured duration of 156.6 ms at ① includes the silent phase before the [k] of ⎸kuliminen⎸

(4) cZwieb 3



1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: mid (1/3)	A: 276—296—239	v. high/high/mid-high
high (1/3)	B: 228—340—266	
mid — high (1/3)	C: 248—470	

2. Loudness/ Intensity

Results listening tests	Results instrumental anaylses (dB)	Evaluation instr. results
A → C: mid (3/3)	70—67—69—71	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: mid (3/3)	A: 89.7	224.3	mid
	B: 90.0	218.6	mid
	C: 112.4	374.7	slow

4. Pauses/Lengthenings

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	√ (2/3)	√ Length: 72.9 ms	conf. present
2	Lengthen.	filled |da|	√ (1/3)	√ Length: 300.0 ms	conf. present
3	Lengthen.	filled |aʊ̯ x|	√ (2/3)	√ Length: 309.0 ms	conf. present
4	Pause	filled [ə]	√ (3/3)	√ Length: 346.0 ms	conf. present
5	Pause	filled [ʔ]	(-)	√ Length: 91.0 ms	conf. present

5. Error(s) mit / Zwie- mit Grün

Notes:

(1) To ② and ③: Measurements of duration made here relate to the whole syllables |da| and |aʊ̯ x|.

(5) cGans 1

	①
diː gans daː	ɪst jaː tɔl
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A: high (3/3)	A: 229—366—254	v. high/high/mid
B: mid (3/3)	B: 235—205	

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (3/3)	66—68	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: slow (3/3)	86.3	230.0	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	filled: |tɔl|	(√)	√ Length: 598.7 ms	present L

Notes:

(1) To ①: Based on the measured length of the nucleus, |gans| (591 ms.), and the mean syllable duration for this section (230 ms.), the syllable |tɔl| (length: 598.7 ms.) is regarded as strongly lengthened.

(6) cMango 2

③ ① ②

vasˈhabn̩ dɛn baˈnaːnən	ʊnt ˈmaŋgoːs gəˈkɔstət
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (3/3)	A: 208—240—219	mid-high/mid/mid-low
	B: 204—214—165	

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: soft (2/3); mid — soft (1/3)	67—62—54	mid-soft

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: slow (1/3)	A: 63.4	154.0	mid-fast
fast — slower (2/3)	B: 85.3 x (1.29)	241.7	mid

4. Pauses/ Lengthenings

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	√ (3/3)	√ Length: 301.0 ms	conf. present
2	Pause	empty	√ (1/3)	×	not conf. present
3	Lengthen.	[nən]	(-)	√ Length: 178.0 ms	conf. present

Notes:

(1) To ②: The syllable |ʊnt| ends with slight laryngealization. This may have been misinterpreted as a pause/hesitation by one of the judges.

(7) cMoon 3

② ①

da:ˈhabn̩ vi:ɐ ʃo:n	ˈmu:nbu:tˌs
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (1/3)	A: 180—200—185	mid/high/low
mid — high — low (2/3)	B: 285—135	

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (2/3); loud (1/3)	73—72—73—67	mid-loud

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid — slow (2/3)	80.8	139.2	mid
fast — slower (1/3)	135.7 x (1.6)	407.0	v. slow

4. Pauses/ Lengthenings

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	√ (3/3)	√ Length: 130.0 ms	conf. present
2	Lengthen.	|ʃo:n|	(-)	√ Length: 332.4 ms	conf. present

Notes:

(1) To ②: The measured duration of the syllable |ʃo:n| is 332.4 ms. Based on the mean syllable duration for this section, i.e. 139.2 ms, this syllable may be regarded as lengthened.

(8) cBlum 3

②①

baɪ̯ deːn ˈbluːmən	ˈhabn̩ viːɐ̯ hiːɐ̯	ˈroːzn̩
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: high (2/3)	A: 185—390	mid/v. high/
high/v. high (1/3)	B & C: 195—163—401	mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: loud (1/3); mid/soft(1/3)	73-71-70	mid-loud
soft (1/3)		

3. Tempo

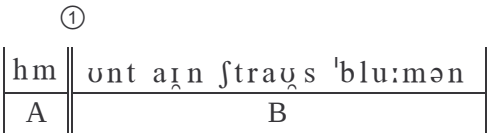
Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid (2/3)	68.1	187.5	mid
mid — slower (1/3)	118.7	276.8	slow

4. Pauses/ Lengthenings

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	filled [m]	√ (3/3)	√ Length: 230.0 ms	conf. present
2	Lengthen.	| hiːɐ̯ |	(-)	√ Length: 289.1 ms	conf. present

(9) cBlum 1



1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid/high —	A: 250—410	mid/v. high/
lower — high (3/3)	B: 208—163—484	mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (2/3); soft (1/3)	70—67—68	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: slow (2/3)	A: [335.0 ms]		slow
mid (1/3)	B: 103.9	332.4	

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	filled [h]	(√)	√ Length: 514.0 ms	present

Notes:

(1) To①: This pause is phonological, as the preceding [hm] has a genuine (fall-rising) contour and may therefore be regarded as standing for an utterance. While it could conceivably count as long, as its length (514.0 ms) is superior to the mean syllable length of this section (332.4 ms), its auditory effect is, however, normal.

(10) cSchoko 3

	①	
jaː	ʃokoˈlaːdə ʊnt	ˈzaːnəbɔŋˌbɔŋs
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A: low — high (3/3)	A: 145—291	low/v. high
B → C: mid — low (3/3)	B: 170—281	mid-low/high
	C: 158—137	mid-low/low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: low (1/3); mid (2/3)	68—72—68	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
	A: [580.0 ms]		
A → C: slow (2/3)	B: 80.0	176.0	mid
slow — mid (1/3)	C: 95.5 $_{x\ (1.2)}$	266.3	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	(√)	√ Length: 170.0 ms	present

Notes:

(1) To ①: This pause is phonological, as the preceding |jaː| has a (rising) contour of its own and may thus be regarded as standing for an utterance.

(11) cBlut 3

ʊnt ʃaʊ̯n ziː mal hiːɐ diː	ˈbluːtvʊrst
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (3/3)	A: 246—200	mid-high/high
	B: 285—167	high/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: loud (1/3); mid (2/3)	74—68—64	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A: fast (3/3)	43.0	114.7	fast
B: slow (3/3)	99.2 x (2.3)	446.5	slow

.....

(12) cMango 3

ɪcˈglaʊ̯bə	ˈmaŋgo vaːɐ nɔx das ˈandərə	nɛ
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A & B: mid — low (3/3)	A: 205	mid
C: high (3/3)	B: 270—150	high/low
	C: 207—524	mid/v. high

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A →C: soft (2/3); mid/soft (1/3)	63—72—64	mid-soft

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: mid (2/3)	A: 67.3	157.0	mid
slow (1/3)	B: 81.5	203.9	mid
	C: [278.0 ms]		

(13) cBlut 4

①

dan ˈbraʊ̯xə ɪç nɔx ˈʊnbədɪŋt	ˈblu:tvʊrst
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid — lower (3/3)	A: 211—290—222	mid/high
	B: 230—150	mid/low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (3/3)	65—65—62	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid/fast —	A: 68.3	179.3	mid
slower (3/3)	B: 101.4 x (1.4)	456.5	slow

4. Pauses/ Lengthenings

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	√ (2/3)	×	not conf.present

Notes:

(1) To ①: The final [t] of |ʊ n b ə d ɪ ŋ t | is very strongly aspirated. This is unusual and may have been misinterpreted by two of the judges as a pause/hesitation

(14) cMango 1

②①

vas ˈkɔstn̩ dɛn diːˈmaŋgoːs ˈhɔɪ̯̂tə	das ˈvyrdə mɪç ɪntərɛˈsiːrən
A	B

1. <u>Pitch/Frequency</u>

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A: high — low (3/3)	245—347—167	mid-high/v. high/mid-low
B: high — low (3/3)	240—344—150	mid-high/v. high/ low

2. <u>Loudness/ Intensity</u>

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid/loud (3/3)	69—68—69	mid-loud

3. <u>Tempo</u>

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid (1/3)	68.3	174.5	mid
fast (2/3)	60.1	165.4	fast

4. <u>Pauses/Lengthenings</u>

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	missing	√ (1/3)	√	absent
2	Lengthen.	[tə]	(-)	Length: 10.1 ms	absent

<u>Notes:</u>

(1) To ①: The measured silent period between |hɔɪ̯̂tə| and |das| is 19.1 ms long. A comparison with the length of the silent phase before the [d] of |vyrdə| (13.4 ms) shows that this silent period is barely longer than the expected silent phase before the [d] of |das|. Therefore, pause 1 is regarded here as absent. This is also the auditory impression.

(2) To ②: The measured length of |hɔɪ| is 178.4 ms. Based on the mean syllable length of this section (174.5 ms), this syllable is regarded as not lengthened.

(15) cKuli 3

ɪç fɛʁˈkaʊ̯fə ˈiːnən naˈtyːʁlɪç ˈgɛʁnə	ˈdiːzə ˈkuːliˌmiːnən
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid — low (3/3)	A: 220—265—171—195—230—215	mid-high/high/
	B: 215—168	mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (3/3)	70—70—74—68	loud/mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: fast (3/3)	A: 60.5	142.9	fast
	B: 73.8 x (1.21)	160.0	mid

.....

(16) cVani 2

hast duː deːn	vanɪˈliːntʂʊkʁ	fɛʁˈgɛsn̩
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A & B: mid — high (3/3)	A: 230—195	mid-high/mid
C: mid — high (3/3)	B: 190—302—440—247	mid/v. high/high
	C: 193—240	mid/mid-high

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid (3/3)	65—57—55	mid-soft

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: mid (2/3)	A: 50.1	150.3	fast
A: mid; B & C: fast (1/3)	B: 78.7	173.2	mid
	C: 93.3	217.6	mid

(17) cGans 4

② ③ ①

ʊnt dan ˈhabə ɪç als ˈnɛːçstəs	gans
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid/low (3/3)	A: 190—239—250—225	mid/mid-high/
	B: 193—141	mid-low/low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: low (1/3); mid (2/3)	67—68—67	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A →B: mid/fast — slower (3/3)	A: 75.1	206.5	mid
	B: [594.0 ms]		

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	√ L (1/3)	√ Length: 206.0 ms	conf. present
3	Lengthen.	[təs]	(-)	√ Length: 335.0 ms	present L

b. Non phonological

No.	Type	Feature(s)	Results auditory tests	Results instrumental analyses	Evaluation instrumental results
2	Lengthen.	[s]	√ (1/3)	√ Length: 154.0 ms	conf. present

Notes:

(1) To ①: The silent period between |n ɛ ː ç s t ə s| and |gans| has a length of 206.0 ms, including the silent phase before the [g] of |gans|. As this corresponds approximately to the mean syllable length of this section (206.5 ms), this silent phase is regarded as a pause, however not a long one.

(2) To 3: The measured length of the syllable |n ɛ ː ç s| of |n ɛ ː ç s t ə s| is 395.3 ms. Based on the mean syllable length of this section (206.5 ms), this syllable is regarded as strongly lengthened.

(18) cZwieb 2

jɛtʂst ˈrɔɪ̯mən viːɐ ɛɐst mal diː ˈtʂviːbl̩n	ʊnt diː kaˈrɔtn̩ vɛk
A	B

1. <u>Pitch/Frequency</u>

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (1/3)	A: 246—200	mid-high/mid
mid — low (2/3)	B: 186—180—190—175	mid-low

2. <u>Loudness/ Intensity</u>

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: soft (1/3); mid (2/3)	69—65—62	mid

3. <u>Tempo</u>

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid (1/3)	A: 49.9	149.5	fast
fast —slower (2/3)	B: 81.0 x (1.6)	189.0 x (1.26)	mid

<u>Notes:</u>

(1) To tempo and slow-down ratio in section A: In this section there is a very large number of reductions, resulting in the disappearance of all but 22 segments. For this reason, calculations of mean segment length and slow down ratio based on *underlying* segments was not thought to be appropriate. Calculations based on the present 22 segments yielded a speech tempo of 61.1 ms/segment and a slow-down ratio of × 1.32, the latter very close to the slow-down ratio based on mean syllable duration (× 1.26). As the final result an approximate value of × 1.3 was taken.

(19) cSchoko 2

ɪç ˈvɔltə dɔx ʃokoˈlaːdə	fyɐ deːn ˈkuːxn̩ nɔx
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (1/3)	A: 200—232—213	mid/mid-high
mid — high (2/3)	B: 346—169	v. high/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (1/3); soft (2/3)	66—66—62	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid/fast (3/3)	A: 62.9	141.5	fast
	B: 81.3 x (1.29)	211.4	mid

(20) cKuli 2

	②	①
ˈaːbɐ daː vaːɐ dɔx aɪ̯n ˈangəboːt gəˈveːzn̩ |		fɔn ‖
A		A

nɔɪ̯n maːrkˈt͡svant͡sɪç |	fyɐ diː ˈkuːliˌmiːnən
B	C

1. <u>Pitch/Frequency</u>

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A→ C: mid — high —low (3/3)	A: 206—276—204	mid/high
	B: 190—235—410—237	mid/mid-high/v. high
	C: 225—195	mid-high/mid

2. <u>Loudness/ Intensity</u>

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid/soft (3/3)	67—65—63	mid

3. <u>Tempo</u>

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: fast — slow (1/3)	A: 78.9	169.9	mid
mid — fast (1/3)	B: 81.8	286.4	mid
mid— fast — mid (1/3)	C: 58.1 $_{x\ (-1.47)}$	135.7	fast

4. <u>Pauses/ Lengthenings</u>

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	filled: [ʔ]	√ (3/3)	√ Length: 110.0 ms	conf. present

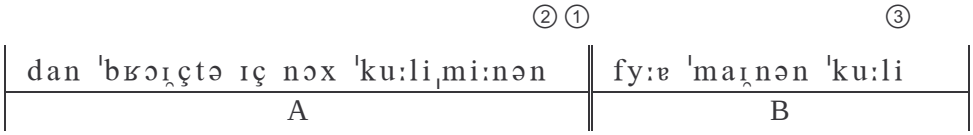
<u>Notes:</u>

(1) To ①: The length of the syllable |fɔn| is 290.0 ms. Based on the calculated mean syllable length of this section (165. 2 ms) this syllable may be regarded as lengthened.

(2) To ②: Although a minor intonation boundary is expected between |gəveːzn̩ | and |fɔn|, there is no silent period at all between |gəveːzn̩ | and |fɔn|. Slight lengthening is however present on |gəveːzn | and the auditory feeling is normal. In the calculation of tempo |fɔn| was included in section A.

Table B: Results for overall pitch/frequency, loudness/intensity, tempo and pauses/ lengthenings (Sybille):

(1) sKuli 1



1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A: mid — high (3/3)	219—291—353—182	mid-high/v. high/mid-low
B: mid — high — mid (3/3)	200—235—200	mid/mid-high/mid

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid/loud — soft (2/3) mid (1/3)	75—75—70	loud/mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid (3/3)	A: 77.4	197.8	mid
	B: 70.4 x (- 1.09)	169.0	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	√ (2/3) L (1/3)	√ Length: 85.0 ms	present, not L
2	Lengthen.	[nən]	(-)	√ Length: 263.9 ms	present
3	Lengthen.	|kuːli| absent	(-)	√ Length: 339.0 ms	absent

Notes:

(1) To ③: The measured length of |k u ː l i| 2 is 339.0 ms. Based on the mean length of two syllables in this section (2 × 169.0 ms = 338 ms), this word is regarded as not lengthened.

(2) sGans 1

kan ɪç dan ˈmɔrgn̩	ˈaɪ̯nə ˈfrɪʃə gans ˈhaːbn̩
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid/high —	A: 211—302	mid-high/v. high
higher (3/3)	B: 264—280—197—251—421	high/v. high

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (3/3)	72—67—68	mid

1. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
A → B: mid/fast (1/3)	ms/segment	ms/syllable	
mid (2/3)	A: 57.3	149.2	fast
fast (1/3)	B: 71.9 x (1.25)	164.4	mid

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(3) sSchoko 4

①

jaː ˈvɛlçə ʃokoˈlaːdə	zɔl das dɛn zaɪ̯n
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid/low (3/3)	A: 222—231	mid-high
	B: 200—230—210	mid/mid-high

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
mid —softer (3/3)	68—64—61	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: fast (3/3)	A: 63.1	135.3	fast
	B: 67.5	202.5	mid

(4) sMango 4

①

ˈalzoː ˈmaŋgo ɪst ˈʃviːrɪç	paˈpaja ˈhɛtə ɪç daː
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A: mid — low (3/3)	A: 203—281—242	mid/high/mid-high
B: mid (3/3)	B: 230—265—180	mid-high/high/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
soft— louder — softer (3/3)	70—68—55	mid-soft

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A: fast (3/3)	52.9	136.0	fast
B: slower (3/3)	84.1	168.1	mid

4. Pauses/Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	absent	√ (1/3)	√	conf. absent

Notes:

(1) To ①: The measured silent period between |ʃ v i ː r ɪ ç| and |p a p a j a| is 67.0 ms long, including the silent phase before the [p] of |p a p a j a|. As a comparison, the silent phase before the second [p] in |p a p a j a| was found to be 78.0 ms long. Based on these comparative data, the silent period between |ʃ v i ː r ɪ ç| and |p a p a j a| is not regarded as long enough for a pause, as it is not even as long as the silent phase before [p] may be expected to be. As a second point, given the measured length of |ʃ v i ː r ɪ ç| (356.2 ms) as compared to the calculated mean length of two syllables of this section ($2 \times 136 = 272$ ms.), the syllable |ʃ v i ː r ɪ ç| is regarded here as lengthened. The auditory impression is, however, that it is not long enough to compensate for the missing pause at ①.

(5) sBlum 1

	①
ˈaɪ̯nən ʃtraʊ̯s ˈbluːmən	ˈbrɔɪ̯ɕtə ɪç nɔx
A	B

1. <u>Pitch/Frequency</u>

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid — high— mid (3/3)	A: 219—190—430—230	mid-high/v. high
	B: 208—200	mid

2. <u>Loudness/Intensity</u>

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (2/3) ; loud (1/3)	67—69—70	mid

3. <u>Tempo</u>

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A: mid — slow (3/3)	A: 78.9	236.8	mid
B: fast (3/3)	B: 53.4 x (-1.39)	146.8	fast

4. <u>Pauses/ Lengthenings</u>

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	absent |nɔx|	(-)	√ Length: 119.0 ms	absent

<u>Notes:</u>

(1) To ①: The measured length of |nɔx| is 119.0 ms. As compared with the mean syllable length for this section (146.8 ms), this syllable is regarded as not lengthened.

(6) sKiwi 2

②		①
hm	ˈvifiːl ˈkiːvis hast duː gəˈhoːlt	zaːkst duː
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: high — v. high (3/3)	A: 223	mid-high
	B: 250—335	high/v. high
	C: 401—436	v. high

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: loud (1/3); mid (2/3)	64—63—59	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: fast (3/3)	A: [251.0 ms]		
	B: 47.4	130.2	fast
	C: 49.3 x (1.04)	172.5	fast

Notes:

(1) To ①: There is no need for a pause here, since the following |z a ː k s t d u ː| forms the tail of this utterance. So the absence of a pause here, which was confirmed by instrumental measurements, is not marked. Auditorily there is also nothing unusual about this part of the utterance.
(2) To: ②While | hm | is 251.0 ms long, there is no silent period at all between | hm | and | v i f i ː l . The auditory impression is that there is a phonolog. pause missing here.

(7) sMango 3

② ①

ˈmaŋgosˈhaːbə ɪç ɪmˈaʊ̯gn̩ blɪk nɪçt	ɛs ɪstjɛt͡st nɪçt diː	ˈjaːrəs˧t͡saɪ̯t daˈfyːɐ
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: mid/high —	A: 302—222—245	v. high/high/
low/mid (3/3)	B → C: 190—202—150	mid-low/low/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid — softer (3/3)	76—67—62	loud-mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: fast (3/3)	A: 53.3	127.9	fast
	B & C: 57.6	161.4	fast

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	absent	√ (1/3)	√	conf. absent
2	Lengthen.	|nɪçt|	(-)	Length: 203.0 ms	absent

Notes:

(1) To ①: Instrumental analyses showed that there is no silent period at all between |nɪçt| and |ɛs|.

(2) To ②: Based on the mean syllable length of this section (127.9 ms), |nɪçt|, with a measured length of 203 ms, is regarded here as not lengthened.

(8) sSchoko 3

①

jaː		ˈvɛlçə ʃokoˈlaːdə ˈvɔltn̩ ziː dɛn
A		B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid —	A: 200—165—189	mid/mid-low
mid/low (3/3)	B: 262—203—178	high/mid/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (3/3)	73—67—61	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid (1/3); fast (2/3)	A: [295.0 ms]		
	B: 59.2	136.2	fast

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	Filled [a]	(√)	√ Length: 189.4	present

Notes:

(1) To ①: While a pause is missing between A and B, the lengthening on |j aː| is such that it may be treated as compensating for the missing pause. This is also the auditory impression.

(9) sKiwi 1

②①

ja da ˈhɛtə ɪç ˈgɛrnə draɪ̯ ʃtʏk	draɪ̯ ˈkiːvis ˈbɪtə
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (2/3)	A: 246—276—220—200	high/mid-high/mid
low (1/3)	B: 232—153	mid-high/low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (2/3); loud (1/3)	73—69—64	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: fast — mid (3/3)	A: 71.0	173.6	mid
	B: 83.5	200.4	mid

4. Pauses/Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	(-)	√ Length: 129.7 ms	present
2	Lengthen.	[k]	(-)	√ Length: 89.6 ms	present

Notes:

(1) To ① & ②: The lengthening of [k], in the form of prolonged aspiration, and the silent period between [k] and the [d] of the following |d r a ɪ| (including is silent phase) add up to a total of 219.4 ms. The auditory impression, however, is that it is not long enough to count as a full phonological pause.

(10) sMoon 2

ˈvaːrən dɛn ɪn ˈiːrɐ ˈgrøːsə ˈmuːnbuːt̬s daː
A

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A: mid (3/3)	251—229—250—239—286	high/mid-high/v. high

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A: loud (1/3); mid (2/3)	66—63—62	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A: fast (3/3)	67.8	147.1	mid

.....

(11) sKiwi 3

ˈkiːvis ˈhaːbə ɪç aʊ̯x daː
A

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A: mid — high	232—411—191	mid-high/v. high/mid/
— low (3/3)	—168	mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A: mid (2/3); mid — loud (1/3)	68—64—58	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A: fast (3/3)	64.3	137.7	mid

(12) sKuli 4

① ②

m	daː zɪnt diː ˈkuːliˌmiːnən
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A: mid (3/3)	A: 229—340	mid-high/v. high/
B: low (3/3)	B: 253—190	high/mid

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: soft (2/3); mid (1/3)	62—65—66	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid (1/3)	A: [231.0 ms]		fast
fast (2/3)	B: 55.4	134.6	

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	[m]	(√)	√ Length: 231.0 ms	present
2	Pause	absent	(-)	√ Length: 88.3 ms	present S

Notes:

(1) To ①: As compared to the mean syllable length of the following section, [m] may be regarded as rather long, however whether it is actually lengthened or not, is difficult to decide. The auditory impression is that it compensates fully for the following rather short phonological pause at ②.

(2) To ②: The measured silent period between [hm] and |daː| is only 88.32 ms long. Based on the mean length of one segment (55.4 ms) and one syllable (134.6 ms), it may be regarded as a rather short phonological pause. This is also the auditory impression.

(13) sBlum 3

ˈbluːmən ˈhaːbə ɪç ɪm ˈaʊ̯gn̩blɪk nɪçt da
A

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A: mid/high —	297—262—165	v. high/high/mid/
lower (3/3)	—150	mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A: loud (1/3); soft (1/3); mid/soft (1/3)	72—65—58	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A: mid/fast (3/3)	54.4	138.5	fast

.....

(14) sKiwi 4

ˈvifiːl ˈkiːvis braʊ̯xst duː
A

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A: mid — low — mid (3/3)	255—305—191—444	high/v. high/mid/v. high

2. Loudness/Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A: mid (2/3); loud (1/3)	68—69—65	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A: fast (2/3); mid (1/3)	57.2	171.7	fast

(15) sMoon 1

③①　　②

gu:t | dan ˈne:mə ɪç	aɪ̯n pa:ɐ ˈmu:nbu:t̚s	ɪn ˈgrøsə zɛks ʊnt ˈdraɪ̯ sɪç
A　　B	C	D

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → D: low — mid —	A: 236	mid-high/
low (3/3)	B: 219—271	mid/high/
	C & D: 302—265—214—156	v. high/mid-low

2. Loudness/Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A - D: mid (3/3)	68—69—67	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A & B: mid/fast (3/3)	A: 68.0	204.0	mid-fast
C & D: slower (3/3)	B: 43.5	98.0	fast
	C: 84.6	232.7	mid
	D: 77.2 $_{x\ (-1.1)}$	220.4	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	absent	(-)	√	absent
2	Lengthen.	absent	(-)	√	absent
3	Lengthen.	|gu:t|	(-)	√ [u] : 99.3 ms	present

Notes:

(1) To ①: The measured length of the silent period between the [t] of |gu:t| and the [d] of |dan| is 52.0 ms. As this is rather less than the mean segment length (68.0 ms) for this section and also includes the silent phase before the [t], this silent phase is regarded as not long enough to count as a full phonological pause.

(2) To ②: While [d r a ɪ] of | d r a ɪ̯ s ɪ ç | is slightly lengthened, with a measured length of 355.0 ms, on the other hand, [s ɪ ç] is rather short, with a measured length of 230 ms., as compared to the mean syllable length of 220.4 ms. Finally, [ç] is very short, with a length of only 57.5 ms., as compared to the mean segment length of 77.2 ms. of this section. This is confirmed by the auditory impression, according to which the second part of this word, in particular the [ç], sounds cut short.

(3) To ③: While |gu:t| may be regarded as lengthened, the auditory impression is that this lengthening cannot fully compensate for the following missing phonological pause, at ①

(16) sBlum 2

③① ④②

A	B	C
ʊnt diː	bluːmən	hast duː ˈbluːmən ˈmɪtgebraxt

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: low — mid (3/3)	A: 213—232	mid-high
	B: 180—390	mid-low/v. high
	C: 275—308—464	high/v. high

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid/soft (3/3)	66—65—62	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: slow/mid — faster (3/3)	A: 87.0	217.5	mid
	B: 73.8	221.5	mid
	C: 43.5	136.6	fast

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
2	Pause	absent	√ (1/3)	√	absent
4	Lengthen.	|bluːmən|	(-)	√ Length: 443.0 ms	absent

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	filled [ə:]	√ (3/3)	√ Length: 322.0 ms	conf. present
3	Lengthen.	|diː|	(-)	√ [i] : 237.0 ms	conf. present

Notes:

(1) To ②: The instrumental analyses showed that there is no silent period at all between the [n] of |bluːmən| and the [h] of |hast|.

(2) To ④: The measured length of [bluː] is 338.1 ms, that of [mən] is 104.3 ms. While [bluː] is lengthened, [mən] is not. The auditory feeling is that there is no compensation for missing phonological pause at ②.

(17) sSchoko 1

②①

vas ˈkɔstət dɛn daː diː | | diː ˈtaːfl̩ ʃokoˈlaːdə
A B

1. <u>Pitch/Frequency</u>

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: high—low—high (3/3)	A: 334—190	v. high/mid-low
	B: 214—229—174—308	mid/mid-high/mid-low/v. high

2. <u>Loudness/ Intensity</u>

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (3/3)	67—68—68	mid

3. <u>Tempo</u>

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: slow — faster (3/3)	A: 90.7	242.0	mid
	B: 74.0	148.0	mid

4. <u>Pauses/ Lengthenings</u>

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
2	Lengthen.	|diː|	(-)	√ [i] :353.0 ms	present

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	√ (3/3)	√ Length: 126.0 ms	conf. present

5. <u>Error</u> diː / diː

<u>Notes</u>:

(1) To ①: The measured length of the silence between $|diː|_1$ and $|diː|_2$ includes the silent phase before the [d] of $|diː|_2$ ‚die'.

Table B: Results for overall pitch/frequency, loudness/intensity, tempo and pauses/ lengthenings (You):

(1) yLu 3

①⑤	②	③④	
haǫ̌	na	wo yaǫ̌	ban gonǧ -jin lu-rouǰ
A	A	A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (2/3)	A:190—150	mid-low/low
low (1/3)	B: 205—176	mid/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid/loud (1/3);mid (2/3)	66—64—63	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: slow (1/3)	A: 207.6	363.3	v. slow
fast—slow (2/3)	B: 81.0	210.6	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	|haǫ̌|	√ (2/3)	Length: 210.0 ms	not present
2	Lengthening	|na|	√ (2/3)	√ Length: 373.9 ms	present
5	Pause	absent	(-)	√	absent

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
3	Lengthen.	|yaǫ̌|	√ L (3/3)	√ Length: 668.0 ms	conf. present L
4	Pause	empty	(-)	√ Length: 268.0 ms	conf. present

Notes:

(1) To ②: The strong lengthening on |na| compensates fully for the phonological pause missing here.

(2) yLong 3

⑤ ①	⑥ ②		③
haǫ ba	na	wo yaǫ	ǰi gonǧ -jin lonǧ -xi̯a
A	B	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: mid (2/3)	A & B: 162—143	mid-low/low
low (1/3)	C: 170	mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid (1/3); soft (2/3)	56—62—64—60—62	mid-soft

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: slow (3/3)	A: 134.2	268.4	v. slow
	B: 221.0	368.3	v. slow
	C: 103.6	248.8	slow

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	absent	(-)	√	absent
2	Pause	absent	(-)	√	absent
5	Lengthen.	|ba|	(-)	√ Length: 290.0 ms	present
6	Lengthen.	|na|	(-)	√ Length: 227.0 ms	absent

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
3	Pause	empty	√ (3/3)	√ Length: 656.0 ms	conf. present
4	Lengthen.	| yaǫ |	(-)	√ Length: 663.0 ms	conf. present

Notes:

To ①: This pause, though strictly speaking absent, is however compensated fully by the lengthening on |ba|.

(2) yMing 3

①②	④	③
mingˇ-zh̯i	wo xu- yao̯	yˇi fen
A	A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (2/3)	A: 180	mid-low
mid—low (1/3)	B: 158—171	low/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (3/3)	66—57—72—61	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A: mid; B: slow (2/3)	A: 105.4	263.5	slow
mid/slow (1/3)	B: 121.6	219.0	slow

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	|zh̯i|	(√)	√ Length: 284.0 ms	present
2	Pause	absent	(-)	√	absent

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
3	Pause	empty	(-)	√ Length: 50.0 ms	present S
4	Lengthen.	|yao̯|	√ L (3/3)	√ Length: 395.0 ms	conf. present L

Notes:

(1) In this utterance |mingˇ-zh̯i| is not a topic but a (topicalized) direct object. Therefore, no pause is expected here. On the other hand, a slight lengthening on the preceding word is expected to signal the boundary between the two adjacent tone-groups. Indeed, based on the calculated mean syllable length of this section (263.5 ms), |zh̯i|, with a measured length of 284.0 ms, may be regarded as slightly lengthened. In view of the fact that it is the non-prominent syllable of this tone-unit, this lengthening may well serve this very purpose.

(4) yLizhi 4

③		②①
a:	li-zẖi xi̯an-zai̯ yǐ-jinǧ	sẖanǧ-sẖi le
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: mid (1/3)	A & B: 205—202	mid
high (2/3)	C: 152	low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid (2/3); loud (1/3)	76—69—69—68	loud-mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: slow (2/3)	A: [629.0 ms]		
mid-slow-mid (1/3)	B: 123.2	266.8	slow
	C: 117.8	275.0	slow

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
3	Lengthen.	[a:]	√ L (3/3)	√ Length: 629.0 ms	present L

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	√ L (3/3)	√ Length: 1.63 secs.	conf. present L
2	Lengthen.	|jinǧ|	(-)	√ Length: 531.0 ms	present L

Notes:

(1) To ③: While strictly speaking there is no pause after [a:], there is a strong lengthening on [a:] which compensates fully for its absence.

(5) yMan 3

① ⑥④ ③② ⑤

haoˌ	na	wo yaoˌ	wuˌ-ge	baiˌ-man-touˌ
A	B	B	C	

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: mid (3/3)	A & B: 155—157	low
	C: 167—153	mid-low/low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid (1/3); soft (2/3)	58—67—69—57	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: slow (1/3); mid (2/3)	A: [277.0 ms]		
	B: 161.0	268.3	v. slow
	C: 127.8	255.6	v. slow

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	(√)	√ Length: 54.0 ms	present S
4	Pause	absent	(-)	√	absent
6	Lengthen.	|na| absent	(-)	√ Length: 179.0 ms	absent

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
2	Pause	Empty	√ L (3/3)	√ Length: 761.0 ms	conf. present L
3	Lengthen.	|yaoˌ|	(-)	√ Length: 407.0 ms	conf. present L
5	Lengthen.	|ge|	√ (2/3)	√ Length: 364.0 ms	conf. present L

Notes:

(1) To ②: This pause is in fact not quite empty but contains a very soft, barely audible [l]. It may be that this was the initial segment of an erroneous |liˌangˇ | ("two") which You subsequently changed to a |wˌu| (five).

(2) To ⑥: Based on the mean syllable length of this section (268.3 ms.), |na|, with a measured length of 179.0 ms., may be regarded as not lengthened and therefore unable to compensate for the following missing phonological pause at ④. This is confirmed by the auditory impression.

(3) To ①: Based on the mean syllable length of section B, | haoˌ | is not lengthened. This is also the auditory impression.

(6) yLizhi 2

② ①		④③
ni kan y̆i xi̯a	du̯i y̆i xi̯a	zh̯e li-zh̯i du̯o sh̯ao̯ qi̯an
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: high (3/3)	A & B: 162—271—225	mid-low/high/mid-high
	C: 263—160	high/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: loud—mid (2/3) loud/mid (1/3)	64—66—65	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: fast (2/3)	A: 63.3	126.5	fast
A: fast; B: slower; C: fast (1/3)	B: 122.0	203.3	slow
	C: 71.2	154.3	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	(-)	√ Length: 79.0 ms	present S
4	Lengthen.	|xi̯a|[2]	√ (2/3) L (1/3)	√ Length: 329.6 ms	present L
3	Pause	absent	(-)	√	absent
2	Lengthen.	|xi̯a|[1]	(-)	√ Length: 152.0 ms	present

Notes:

(1) To ③ & ④: Although the phonological pause at ③ is absent, the lengthening at ④ on |xi̯a|[2], which - based on the mean syllable length of this section, is rather long, may be expected to be able to compensate for the missing pause at ③. This is confirmed by the auditory impression.
(2) To ① & ②: Although |xi̯a|[1] at ② is also lengthened, based on the mean syllable length of this section, this lengthening is regarded as only slight and not able to compensate for the short pause at ①. This is also the auditory impression.

(7) yLing 2

①	②	③
ni zh̩e-ge liŋ̌ -meŋ̌	zh̩er mai̯ du̯o sh̩ao̯ qi̯an	y̌i gon̆-jin a
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: mid (1/3)	A: 205—211	mid-high
low (2/3)	B: 170—152	mid-low/low
	C: 120	low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid (1/3); soft (2/3)	70—72—61—51	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: slow—mid (2/3)	A: 124.0	297.8	fast
slow (1/3)	B: 86.0	189.2	mid
	C: 83.4	166.8	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
2	Pause	empty	√ (3/3) L (2/3)	√ Length: 755.0 ms	present L

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	| ge |	√ (3/3)	√ Length: 403.0 ms	conf. present L

Notes:

(1) To ②: The syllable |meŋ̌| preceding the pause at ② has a measured length of 477.1 ms. Based on the mean syllable length of this section (297.8 ms), this is regarded as lengthened. By comparison, the measured duration of |liŋ̌| is 198.0 ms.
(2) To ③: No pause is expected at ③.

(8) yLong 2

ni weị-sḥemmạ	yaọ maị longˇ-xịa
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (2/3)	A: 228	mid-high
low (1/3)	B: 220—156	mid-high/low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: loud (3/3)	68—65—58	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: fast—slower (1/3) mid (1/3); fast (1/3)	A & B: 67.8	144.1	mid

.....

(9) yLing 1

	①	②
xịan-zaị linˇg-mengˇ	ỳi gongˇ-jin	sḥị sḥị-er ma-ke
A	A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (2/3)	A: 226—217	mid-high
low (1/3)	B: 150	low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (3/3)	63—61—63—55	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid (3/3)	A: 69.3	178.1	
	B: 99.4	198.8	

Notes: To ① & ②: No pauses are expected here.

(10) yLong 1

①	②
longˇ-xi̯a yˇi gongˇ-jin	cai̯ shi̯-er ma-ke
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: low (2/3)	A: 150	low
mid (1/3)	B: 168—137	mid-low/low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (3/3)	65—62—66—54	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid (3/3)	A: 67.4	161.8	mid
	B: 100.7 (x 1.49)	201.4	slow

Notes:

(1) To ① & ②: The auditory analysis of this utterance showed that no pauses are expected here. In the latter case this may be due to the fact that section A (|yˇi gongˇ-jin|) serves as the subject of the utterance. In the first case, it appears to be due to the fact that |longˇ-xi̯a| is the topic of the utterance.

(11) yMan 2

①	
minğ-ti̯an zao̯-sh̯anğ yao̯ ch̯i de man-tou̯	ni you̯ mei̯ you̯ mai̯
A	B

1. <u>Pitch/Frequency</u>

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (2/3)	A: 188—193—168	mid-low
low (1/3)	B: 114	low

2. <u>Loudness/ Intensity</u>

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: loud (3/3)	66—70—67—63	mid

3. <u>Tempo</u>

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: fast (3/3)	A: 58.2	142.3	fast
	B: 66.5	133.0	mid

<u>Notes:</u>

(1) No pause is expected at ①, obviously due to the fact that section A is not a topic but a fronted (topicalized) direct object.

(12) yLu 2

①④	③ ②	⑥ ⑤	
ran-hou̯	zh̯e-ge	lu-rou̯	du̯o sh̯ao̯ q̯ian
A	A	A	B

1. <u>Pitch/Frequency</u>

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: low (3/3)	A: 207—170	mid/mid-low
	B: 150	low

2. <u>Loudness/ Intensity</u>

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (3/3)	72—68—68—72	mid

3. <u>Tempo</u>

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid/slow (1/3)	A: 126.1	273.3	v. slow
mid (1/3); slow (1/3)	B: 73.6	171.6	mid

4. <u>Pauses/ Lengthenings</u>

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	absent	(-)	√ |hou| = 275.0 ms	absent
4	Pause	absent	(-)	√	absent

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
2	Pause	empty	√ (3/3)	√ Length: 230.0 ms	conf. present
3	Lengthen.	|ge|	(-)	√ Length: 325.0 ms	conf. present
5	Pause	empty	√ L (3/3)	√ Length: 690.0 ms	conf. present L
6	Lengthen.	|rou̯|	(-)	√ Length: 425.0 ms	conf. present

<u>Notes:</u>

(1) To ⑤: No pause is expected here, as |zh̯e-ge lu-rou̯| represents the subject of this utterance.

(13) yLa 2

⑦①	⑤②		⑥	④	③
na	la-jiao ne	wo-men jin-tian zuo cai yao la-jiao		ni you mei you mai	mai la-jiao a
A	A	B		C	D

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → D: mid (1/3) high (1/3)	A & B: 258— (186)235	high/mid-high
mid/high (1/3)	C → D: 169—157—132	low/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A→D:loud—mid(2/3);loud (1/3)	70—65—68—62—61	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → D: fast (2/3)	A: 91.7	183.5	mid
A → C: mid; D: slower (1/3)	B: 60.0	133.3	mid
	C: 41.5	83.0	fast
	D: 124.0	217.0	slow

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	absent	(-)	√	absent
2	Pause	absent	(-)	√	absent
4	Pause	absent	(-)	√	absent
5	Lengthen.	|ne|	(-)	√ Length: 217.0 ms	present
6	Lengthen.	|jiao|	(-)	√ Length: 201.0 ms	present
7	Lengthen.	|na|	(-)	√ Length: 95.0 ms	absent

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
3	Pause	[m]	√ (2/3)	√ Length: 242.0 ms	conf. present

5. Error: mai/mai

Notes: To ②: The missing phonological pause at ② is fully compensated for by the lengthening at ⑤.

(14) yBing 4

ni yao̱ sẖemm̱a kou̱-wei̱ de	binğ-qi-linğ
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (2/3)	A: 200—196—168	mid/mid-low
high (1/3)	B: 134	low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (3/3)	71—64—68—53	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid (2/3); fast (1/3)	A & B: 72.1	158.7	mid

(15) yLong 4

①	②④	③ ⑤	
longˇ-xi̯a	you̯ a	you̯ a	xi̯an-zai̯ hen pi̯an-yˇi o
A	A	A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: high (3/3)	A: 214—192—175	mid-high/mid-low
	B: 251—195	mid-high/mid

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: loud (3/3)	66—68—62—67	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: fast (2/3); mid (1/3)	A: 96.0	176.2	mid
	B: 86.3	18.0	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	absent	(-)	√	absent
2	Lengthen.	[a] $_1$	(√)	√ Length: 87.5 ms	present S
3	Lengthen.	[a] $_2$	(√)	√ Length: 163.0 ms	present L
4	Pause	absent	(-)	√	absent
5	Pause	absent	(-)	√	absent

Notes:

(1) To ①: The syllable preceding the missing phonological pause at ①, |xi̯a|[1], is 171.0 ms long. Based on the mean syllable length of this section (176.2 ms), this is regarded here as not lengthened.
(2) To ⑤: Although, strictly speaking the pause at ① is absent, it is fully compensated for by the lengthening at ③.

(16) yMan 1

② ①

nin bu cẖanǧ-cẖanǧ	zẖer-bi̯an man-tou̯	man you̯ minǧ de a
A	B	C

1. <u>Pitch/Frequency</u>

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: high (3/3)	A: 208	mid
	B: 216	mid-high
	C: 155	low

2. <u>Loudness/ Intensity</u>

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid (2/3); loud (1/3)	63—64—65—64	mid

3. <u>Tempo</u>

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: fast (1/3); mid (1/3)	A: 55.2	151.7	fast
A & B: fast; C: slow (1/3)	B: 60.2	150.5	mid
	C: 86.9 (x 1.44)	191.2	mid

4. <u>Pauses/ Lengthenings</u>

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	absent	(-)	√	absent
2	Lengthen.	|cẖanǧ|$_2$	(-)	√ Length: 169.0 ms	present S

<u>Notes:</u>

(1) To ①: The period between |cẖanǧ|$_2$ and and |zẖer| is 19.9 ms. long. As this includes the silent phase before the [d] of |zẖer|, this is regarded as not long enough for a phonological pause. Indeed, the auditory impression is that a pause is missing here.
(2) To ②: The slight lengthening of |cẖanǧ|$_2$ (169.0 ms. (as compared to a mean syllable length of 151.7 ms) is regarded as not enough to compensate fully the missing phonological pause at 1. This is certainly the auditory impression.
(3) The measured length of |cẖanǧ|$_1$ is 209.0 ms. which is rather long. However, as this syllable is both the prominent syllable of the tone-unit as well as (one of) the focal syllable(s) of this tone-group, a lengthening of this kind is to be expected. It does not alter the auditory impression noted in ②.

(17) yMing 1

①②

zho̱ng-yŭan-jie̱ dao̱ le	ni xu bu xu-yao̱ yĭ die̱an	ming-zhi̱ a
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: mid (2/3)	A: 217—200	mid-high/mid
high (1/3)	B & C: 272—188—135	high/mid-low/low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid (2/3); loud (1/3)	71—70—67—60	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: mid (2/3)	A: 82.6	214.8	mid
A: mid; B: fast;	B: 57.2	114.4	fast
C: mid (1/3)	C: 132.7	265.3	v. slow

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	|dao̱le|	(-)	√	present
2	Pause	absent	(-)	√	absent

Notes:

(1) The instrumental analyses showed that there is no silent period between |le| and |ni|.

(2) To ①: The measured lengths of |dao̱| and |le| are 222.0 ms. and 189 ms. , respectively. Based on the mean length of one syllable, 214 ms., |dao̱| could count as slightly lengthened. On the other hand, it is both the stressed syllable of this tone-unit and the focal syllable of the tone-group, so this lengthening may be expected. While based on mean segment length (82.6 ms.) |le| seems slightly lengthened, this is not the case if one compares its length with mean syllable length. It is therefore concluded that while there is lengthening, it may not be enoungh to compensate for the missing pause at ②. This is confirmed by the auditory impression of the utterance.

(18) yDang 1

④①	⑤	②	⑥③
xin-xi̯an	xin-xi̯an	dangˇ-ran xin-xi̯an	xi̯an-zai̯ dangˇ-ji
A	A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: mid (1/3)	A: 272—163	high/mid-low
high (2/3)	B: 182	mid-low
	C: 240—142	mid-high/low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: loud (2/3); mid (1/3)	72—67—70—66	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A,B: mid—C: fast (1/3)	A: 83.6	251.0	mid
A → C: fast (2/3)	B: 54.1	162.5	fast
	C: 85.1 (x 1.57)	212.7	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	absent	(-)	√	absent
2	Pause	absent	(-)	√	absent
3	Pause	absent	(-)	√	absent
4	Lengthen.	|xi̯an|$_1$	(-)	√ Length: 327.0 ms	present
5	Lengthen.	|xi̯an|$_2$	(-)	√ Length: 452.0 ms	present
6	Lengthen.	|xi̯an|$_3$	(-)	√ Length: 206.0 ms	present

Notes:

(1) To ①, ② & ③: According to the auditory impression of this utterance, the lengthenings at ④ and ⑤ fully compensate for the missing pauses at ① and ③, respectively. This is, however, not the case with the slight lengthening at ⑥, with a length of 206 ms. as compared to a mean syllable length of 162.5 ms. This lengthening at ⑥ cannot compensate for the missing phonological pause at ③.

(19) yLizhi 1

③①		④②	
na	jia̯n-y̆i nin	li-zha̯ zemma̯ yanğ	
A	B	C	

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: high (2/3)	A & B: 232—217	mid-high
mid (1/3)	C: 216—139	mid-high/low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid (2/3); soft (1/3)	72—64—69	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: mid (2/3); slow (1/3)	A: [528.0 ms]		
	B: 109.7	256.0	slow
	C: 73.5	161.8	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	(-)	√ Length: 206.0 ms	present
2	Pause	empty	(-)	√ Length: 20.7 ms	present
3	Lengthen.	|na|	√ (3/3) L (2/3)	√ Length: 528.0 ms	present L
4	Lengthen.	|nin|	√ L (2/3)	√ Length: 466.0 ms	present L

Notes:

(1) To ①: The measured silent period between |na| and |jia̯n| includes the silent phase before the initial [d] of |jia̯n|.

Table B: Results for overall pitch/frequency, loudness/intensity, tempo and pauses/ lengthenings (Wu):

(1) wLizhi 4

①	③ ②	⑤ ④	
a:	li-zẖi duˆi	li-zẖi longˇ-yan	a:
A	B	C	D

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → D: high-mid (1/3)*	A: 205	mid
high (1/3)	B: 250—235	mid-high
mid (1/3)	C: 253—229—180	high/mid-high/mid-low
	D: 200	mid

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → D: soft (3/3)	71—67—72—66	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → D: slow (1/3)	A: [236.0 ms]		
mid (1/3)*	B: 128.1	256.3	v. slow
A fast; B → D: slow (1/3)	C: 87.6	197.2	mid
	D: [478.0 ms]		

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
2	Pause	empty	√ (1/3)	√ Length: 231.0 ms	present
3	Lengthen.	|duˆi|	(-)	√ Length: 360.0 ms	present
5	Pause	empty	(√)	√ Length: 108.0 ms	present
1	Lengthen.	[a:]	√ (1/3)	√ Length: 236.0 ms	present
4	Lengthen.	[a:]	√ (1/3)	√ Length: 478.0 ms	present

Notes:

(1) To ④ & ⑤: The function of this final [a:] is difficult to establish. While it carries a gently falling tone and as such sounds like a final particle, it is not enclitic but separated from the preceding |yan| by a pause of 108 ms., a fact which speaks against its functioning as a particle. As a 3rd point, the tonal movement of the preceding |yan| is not reduced, as would be expected if [a:] were a particle. For the latter two reasons, [a:] is regarded here not as a particle but as a final exclamation.

(2) To ①: While there is no pause after [a:], its lengthening is such that it fully compensates for this missing pause.

(3) To ②: In the same way, the lengthening on ③ (\| duˆi \|) compensates fully for the pause missing at ③.

(2) wNing 4

①	
mai̯ li̯anğ ge ninğ-menğ	pao̯ ch̯a he
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: low (3/3)	A: 222—200—205	mid
	B: 213—182—200	mid-high/mid

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: soft (3/3)	67—70—52—53	mid-soft

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: slow (1/3)	A: 69.7	181.4	mid
fast—slow (1/3) mid—slow (1/3)*	B: 155.0	310.0	v. slow

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	|menğ|	(-)	√ Length: 246.0 ms	present

Notes:

(1) To ①: No pause is expected between the two sections A & B, corrsponding to a minor intonation-group boundary. The measured length of |menğ| is 246 ms. Compared with the mean syllable length of this section (181. 4 ms.), this may be regarded as lengthened.

(3) wBing 3

①

a:	wo jiu̯ xi-huan̯	ninǧ-menǧ binǧ-qi-linǧ
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: high-mid (1/3)	A: 302	v. high
high (1/3)	B: 219—200	mid-high/mid
mid (1/3)*	C: 200—169	mid/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid (3/3)	73—70—62	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: fast (1/3)	A: [220.0 ms]		
mid (1/3)*	B: 68.5	137.0	mid
mid (1/3)	C: 49.3	138.0	fast

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	[a:]	(√)	√ Length: 220.0 ms	present

Notes:
(1) To ①: While strictly speaking, there is a pause missing between ⎸a:⎸ and ⎸wo⎸, this is fully compensated by the lengthening on [a:] at ③.

(4) wBing 2

②①　　③

binğ-qi-lin̆	wanğ le	mei̯-you̯	a
A	B	C	D

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → D: v. high-high (1/3)	A: 340	v. high
high (1/3)	B: 240	mid-high
v. high-mid (1/3)*	C & D: 174	mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → D: loud (3/3)	68—70—73—65	loud-mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → D: mid (1/3)*	A: 54.7	146.0	fast
mid (1/3)	B: 53.2	106.0	fast
fast (1/3)	C: 63.7	127.5	mid-fast
	D: [367.0 ms]		

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
2	Lengthen.	|ling| absent	(-)	√ Length: 158.5 ms	absent
1	Pause	absent	(-)	√	absent
3	Pause	absent	(-)	√	absent

Notes:

(1) To ①: The auditory impression of this utterance is that while a pause is not necessary at ①, as |binğ-qi-lin̆| is not a topic but a (topicalized) direct object - a lengthening on |lin̆| would be indeed expected. Without this lengthening, whose absence was confirmed by the instrumental analyses, this point of the utterance feels overly fast.
(2) To ③: No pause is expected at ③.

(5) wMan 2

①② ③ ④

ei̯-jo:	ni xi̯an-che̯nğ man-tou̯	mai̯-hui̯-lai̯	pa bu gan-jinğ ba
A	B	C	D

1. <u>Pitch/Frequency</u>

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → D: mid (1/3)	A: 170	mid-low
high-mid (1/3)	B: 180—176	mid-low
mid (1/3)*	C: 150	low
	D: 128	low

2. <u>Loudness/ Intensity</u>

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → D: mid (3/3)	67—71—70—67	mid

3. <u>Tempo</u>

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A: slow; B → D: fast (1/3)	A: [552.0 ms]		
A & B: fast; C & D: slow (1/3)	B: 48.8	127.0	fast
A: slow; B → C: fast	C: 52.5	105.0	fast
D: mid (1/3)*	D: 81.2 (x 1.54)	194.8	mid

4. <u>Pauses/ Lengthenings</u>

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	[ei̯-jo:]	√ (3/3) L (1/3)	√ Length: 552.0 ms	present
2	Pause	empty	(-)	√ Length: 126.0 ms	present
3	Pause	absent	(-)	√	absent
4	Pause	absent	(-)	√	absent

<u>Notes:</u>

(1) To ③: Given the fact that |ni xi̯an-che̯nğ man-tou̯| is the subject of this utterance, no pause is expected at ③. While |man| is lengthened (with a measured length of 164. 8 ms), this does not appear to be the case with |tou̯|, whose length is 92.0 ms. The lengthening on |man| may be due to the fact that this syllable is both the prominent syllable of the tone-unit |man-tou̯| and one of the focal syllables of this tone-group. According to the auditory impression, this part of the utterance has a overly fast feeling.

(2) To ④: The auditory impression is that no pause is expected at this point of the utterance. This may be due to the fact that these two minor intonation-groups (C and D) are linked semantically. On the other hand, this point does have a certain overly fast feeling. This again may be due to the fact that neither |hui̯| or |lai̯| appear to be lengthened. On the contrary, |lai̯| is in fact very strongly reduced, and the length of both syllables is 213.0 ms., yielding an approximate mean length of 106.5 ms. for each syllable. Compared with the mean syllable length of this section (105.0 ms.), this may be regarded as non-lengthened.

(6) wLizhi 2

③①		④②	
you̯ mai̯ li-zhi̯	you̯ mai̯ longˇ-yan	zhe̯ gan shemma̯ ya	
A	B	C	

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: high (1/3)	A: 296—333	v. high
v. high (1/3)	B: 360—327	v. high
v. high (1/3)*	C : 352—242—217	v. high/high/mid-high

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A→ C: loud (1/3)*; v. loud (2/3)	72—73—75	loud

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: fast (2/3)	A: 82.8	165.8	mid
mid (1/3)*	B: 71.4	160.8	mid
	C: 84.8	186.6	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	absent	(-)	√	absent
2	Pause	absent	(-)	√	absent
3	Lengthen.	|li-zhi̯|	(-)	√ Length: 330.0 ms	absent
4	Lengthen.	|longˇ-yan|	(-)	√ Length: 212.0 ms	present

Notes:

(1) To ②: While |yan| at ④ is lengthened (with a length of 212.0 ms.), as compared with the mean syllable length of 1160.8 ms, the auditory impression is that this is not enough to fully compensate for the missing phonological pause at ②.

(7) wMan 4

	①		②	
man-tou̯		man-tou̯		zu̯o-hao̯-de man-tou̯ ma
A		B		C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A & B: mid-high	A: 203	mid
C: mid—low (1/3)*	B: 170	mid-low
A & B: high; C: mid (1/3)	C: 182—162	mid-low
A → C: high (1/3)		

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: loud—mid (1/3)	69—65—70—66	mid
loud—low/mid (1/3)*		
loud—low (1/3)		

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: fast—mid (1/3)	A: 78.4	196.0	mid
fast—mid (1/3)*	B: 109.4	273.5	slow
fast—mid (1/3)	C: 75.1	162.8	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	(√)	√ Length: 30.0 ms	present S
2	Pause	[m]	(√)	√ Length: 268.0 ms	present

Notes:

(1) To ①: The length of │man│ is 219 ms. That of │tou̯│ is 173 ms. While │man│ is lengthened (stressed syllable of tone-unit) this is not the case with │tou̯ , so that it does not compensate for the missing pause at ①.

(8) wLizhi 1

	④	①		② ③
linğ-wai̯ wo̯ zai̯ mai̯ yĭi di̯an	ninğ-menğ		li-zhi̯	he lonğ-yan
A	B		B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: mid/high (1/3)*	A: 225—168	mid-high/mid-low
mid (2/3)	B: 200—241	mid/mid-high
	C: 152	mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid (3/3)	71—72—67	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: fast—mid (1/3)*	A: 68.7	137.4	mid
fast—slow (2/3)	B: 111.4	278.5	slow
	C: 129.8	303.0	v. slow

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	√ (3/3)	√ Length: 37.9 ms	present S
2	Pause	empty	√ L (2/3)	√ Length: 507.0 ms	present L
4	Lengthen.	|ninğ-menğ|	(-)	|menğ| = 394.0 ms	present

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
3	Lengthen.	|he|	√ (3/3)	√ Length [ə]: 235.0 ms	conf. present

Notes:

(1) To ① & ④: The measured duration of |menğ| is 394.0 ms. Based on the mean syllable length of this section (278.5 ms.), |menğ| is regarded here as rather strongly lengthened and compensating for the very short pause at ①. This is also the auditory impression of this point of the utterance.

(2) To ②: The measured length of this phonological pause is 507 ms., which is 1.8 longer than the mean syllable length of this section. It is regarded here as overly long and thus possibly containing a non-phonological pause (hesitation). This is confirmed by the auditory impression of this point of the utterance.

(9) wDan 4

e-dan zhu tangˇ	bu tai hao ba
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: high (1/3)	A: 230	mid-high
high-mid (1/3)	B: 202	mid
high-mid (1/3)*	C: 167—160	mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (1/3)	74—70—66	loud-mid
loud—mid (1/3); loud—mid (1/3)*		

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: fast—slow (1/3)	A: 76.9	171.8	mid
mid (1/3); slow—mid (1/3)*	B: 88.4	176.7	mid

.....

(10) wLa 3

ni la-jiao	hen la ma
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A→ B: mid (1/3)	A: 320	v. high
mid/high(1/3) mid/high (1/3)*	B: 216—290	mid-high/high

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: loud (1/3)*; mid (2/3)	72—69—64	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: fast (1/3); fast (1/3)*	A: 52.3	104.7	fast
fast—slow (1/3)	B: 84.3 (x 1.6)	196.6	mid

(11) wDan 12

①	
ji̯e-y̆u ji-dan he ya-dan	zho̯nğ-ji̯an
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (1/3)	A: 235—267	mid-high/high
mid (1/3); mid/low (1/3)*	B: 258	high

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid/loud (1/3)	73—69—68	loud-mid
mid (1/3); mid/loud (1/3)*		

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A: slow; B: fast (1/3)	A: 77.1	165.3	mid
A → B: mid (1/3); mid (1/3)*	B: 84.3	253.0	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	|ji̯an|	√ (2/3) L (2/3)	√ Length: 307.5	present L

(12) wDan 11

	①
o:	e-dan hao̯ chi̯ ma
A	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: mid (1/3); mid (1/3)*	A: 150	low
high (1/3)	B: 195—155— 300	mid-low/low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: mid (3/3)	67—65—62	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid (1/3)	A: [420.0 ms]		
mid (1/3)*; slow—fast (1/3)	B: 97.0	194.0	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	[h]	√ (3/3) L (1/3)	√ Length: 101.0 ms	present S

Notes:

(1) To ①: The measured length of the phonological pause at ① is 101.0 ms. Based on the mean syllable length of section B (194.0 ms.), this is regarded as a short pause. The length of the preceding [o:] is 420 ms., and this syllable may compensate for the following short pause. This is the auditory impression, according to which there is nothing unusual about this point of the utterance.

(13) wMan 3

	②	①
ə:	man-tou̯	ye you̯ man-tou̯
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: mid (1/3)*	A & B: 235—213	mid-high
high (1/3); high (1/3)	C: 235—182	mid-high/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: mid (1/3); loud (1/3)* loud (1/3)	72—69—74—64	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: fast (1/3); mid (1/3)	A: [249.0 ms]		
mid—fast—mid (1/3)*	B: 112.2	280.0	slow
	C: 96.0	192.0	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	[ʔ]	√ (3/3)	√ Length: 110.0 ms	present

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
2	Pause	filled [ə]	×	√ Length: 249.0 ms	conf. present

(14) wLu 4

wo mai̯ yi̯ gonğ-jin	lu-rou̯ ba
A	B

1. <u>Pitch/Frequency</u>

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: low (3/3)	A: 163—205	mid-low/mid
	B: 90—200	v. low/mid

2. <u>Loudness/ Intensity</u>

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: soft (3/3)	72—67—61	mid

3. <u>Tempo</u>

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: mid (1/3); fast (1/3)*	A: 67.7	135.4	mid
fast—slow (1/3)	B: 87.6 (x 1.29)	175.3	mid

(15) wLa 4

③		① ④②	
la-jia̯o	shi̯ ba	dui̯	wo xi-hua̯n la-jia̯o
A	A	B	B

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → B: low (1/3)*	A: 216—205	mid-high/mid
low (1/3); mid/low (1/3)	B: 205—186	mid/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → B: soft (3/3)	65—68—60	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → B: slow—mid (1/3)	A: 108.7	217.5	slow
mid—fast (1/3); mid (1/3)*	B: 97.3	178.3	slow

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	empty	√ (3/3)	√ Length: 171.0 ms	present
2	Pause	absent	(-)	√	absent
3	Lengthen.	|jia̯o|	√ (3/3)	√ Length: 370.0 ms	present
4	Lengthen.	|dui̯|	(-)	√ [ui̯] = 108.0 ms	present S

Notes:

(1) To ①: The measurements of length here include the silent phase before the [d] of |dui̯|.

(2) To ③: The syllable |jia̯o| is 370 ms long. Based on the mean syllable length of this section (217.5 ms), this may be regarded as a long phonological lengthening compensating for the missing pause after | jia̯o |.This is confirmed by the auditory impression of the utterance.

(3) To ④: The measured length of the diphthong [ei̯] in |dui̯| is 108 ms. Based on the mean segment length of this section (97.3 ms), this may be regarded as only very slightly lengthened and therefore probable unable to compensate for the missing pause at ②. This is confirmed by the overly fast auditory impression of this point of the utterance.

(16) wLizhi 3

②		①	
o:	ni zh̩er you̯	hai̯ you̯ longˇ-yan	he li-zh̩i ho
A	B	C	D

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → D: mid (3/3)	A & B: 205	mid
	C: 205—182	mid/mid-low
	D: 222—176	mid-high/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → D: mid (1/3); soft (1/3); soft (1/3)*	70—65—63	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A & B: fast; C: slow (1/3)*	A: [196.6 ms]		
A: fast; B & C: slow (1/3)	B: 76.3	152.7	mid
A → D: mid (1/3)	C: 64.4	160.9	mid
	D: 94.5 (x 1.46)	188.9	mid

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
2	Lengthen.	[ɔ:]	(√)	√ Length: 196.6 ms	present

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Lengthen.	|you̯|	√ (3/3)	√ Length: 204.0 ms	conf. present

5. Error(s): you̯ / hai̯ you̯

(17) wBing 1

	①⑤	⑥②	⑦③	④
wo you̯ yi ge	nü-er	ta xi̯anǧ mai̯ yi di̯an	tanǧ-gu̯o hu̯o-zhi̯	binǧ-qi-linǧ
	A	B	C	D

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → D: mid (3/3)	A: 155—184	low/mid-low
	B: 190—167	mid-low
	C & D: 155—190	low/mid-low

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A→D: mid (2/3);loud/mid(1/3)*	70—75—68—66	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A: fast; B → D: mid (1/3)	A: 132.1	220.2	v. slow
A: slow; B → D: fast (1/3)	B: 57.4	126.2	fast
A: mid; B → D: fast (1/3)*	C: 67.8	169.5	mid
	D: 53.8 $_{x\ (-1.26)}$	143.3	fast

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
4	Lengthen.	|linǧ| absent	(-)	√ Length: 149.0 ms	absent
2	Pause	absent	(-)	√	absent
6	Lengthen.	|er|	(√)	√ [ə] = 149.0 ms	present

b. Non phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
3	Pause	empty	√ (3/3) L (2/3)*	√ Length: 362.0 ms	conf. present
1	Lengthen.	| ge |	√ (3/3)	√ Length: 363.0 ms	conf. present
5	Pause	empty	(-)	√ Length: 118.0 ms	conf. present
7	Lengthen.	|di̯an|	(-)	√ Length: 251.0 ms	conf. present

Notes:

(1) To ③: The measured length of this silent period includes the silent phase before the [t] of |tanǧ|.
(2) To ② & ⑥: According to the auditory impression of this point of the utterance, the lengthening of |er| does not fully compensate for the missing pause at ②.

(18) wNing 2

②①		③
e̯i̯-jo:	ma̯i̯ le	ninğ-menğ
A	B	C

1. Pitch/Frequency

Results listening tests	Results instrumental analyses (Hz)	Evaluation instr. results
A → C: v. high (1/3)	A: 290	high
v. high (1/3)*	B: 239	mid-high
high (1/3)	C: 228	mid-high

2. Loudness/ Intensity

Results listening tests	Results instrumental analyses (dB)	Evaluation instr. results
A → C: loud (1/3)*; loud (2/3)	67—66—67	mid

3. Tempo

Results listening tests	Results instrumental analyses		Evaluation instr. results
	ms/segment	ms/syllable	
A → C: slower-fast (1/3)	A: [311.1 ms]		
mid (1/3)	B: 70.3	140.5	mid
mid (1/3)*	C: 136.5 x (1.9)	409.5	v. slow

4. Pauses/ Lengthenings

a. Phonological

No.	Type	Feature(s)	Results listening tests	Results instrumental analyses	Evaluation instrumental results
1	Pause	absent	(-)	√	absent
2	Lengthen.	[jo:]	(√)	√ Length: 154.0 ms	present
3	Lengthen.	|menğ|	(√)	√ Length: 468.0 ms	present

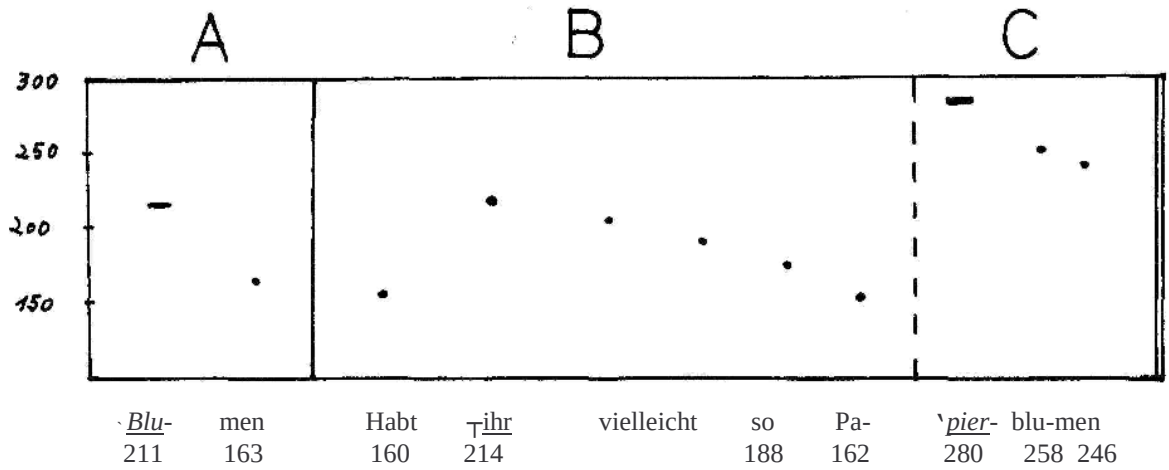
Notes:

(1) To ① & ②: despite the lengthening of [ei] (157.0 ms) and [jo:] (the length of [o:] is 154.0 ms), the auditory feeling of this part of the utterance is that these lengthenings do not fully compensate for the missing phonological pause at ①.

(2) To ③: The measured length of |menğ| is 468.0 ms. This syllable contains a falling added-on intonational pitch-pattern. (See discussion in Chapter 9)

Table C: Results for intonation (Clara:)

(1) cBlum 4



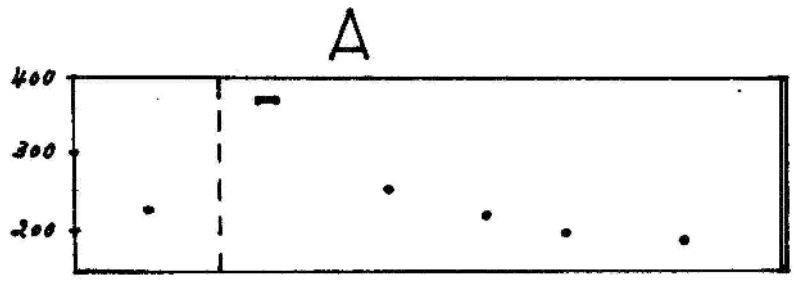
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Blumen	A	mid fall	-	48 (mid)
Papierblumen	C	high fall to mid-high	levelling-off (gentle)	34 (narrow)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
ihr	B	mid falling	52 (mid)

(2) cGans 1

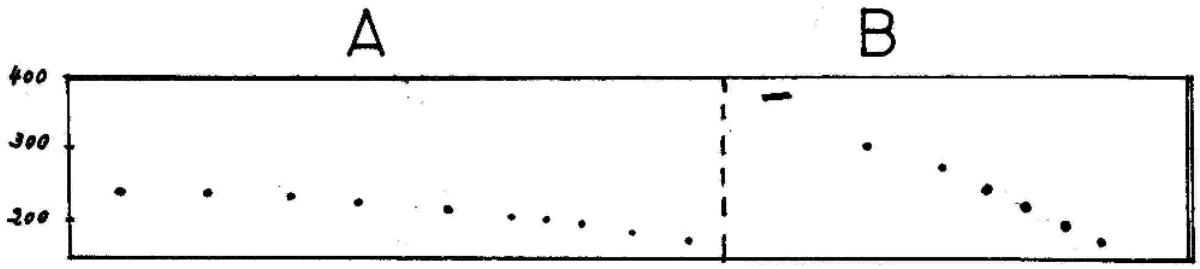


Die *Gans* da ist ja toll
229 366 254 235 205

1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Gans	A	high-fall	gentle	161 (wide)

(3) cKuli 1



„Ach und was ich fast vergessen hätte *Ku*- li- minen brauch(e) ich noch
240 222 225 195 386 302 182

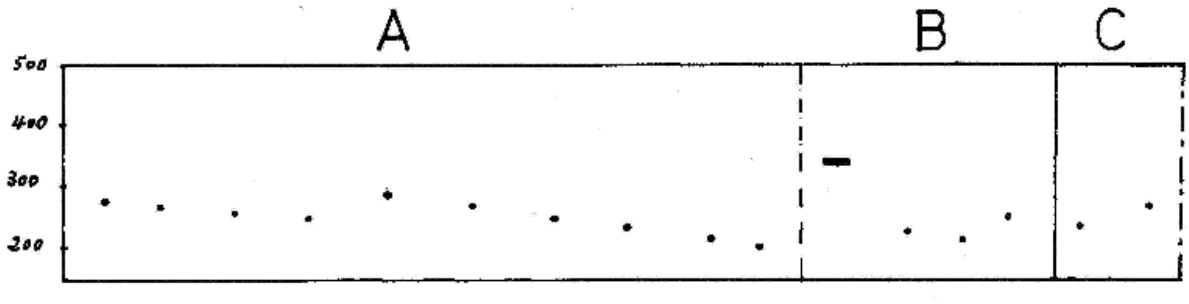
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Kuli	B	high fall	gentle	204 (v. wide)

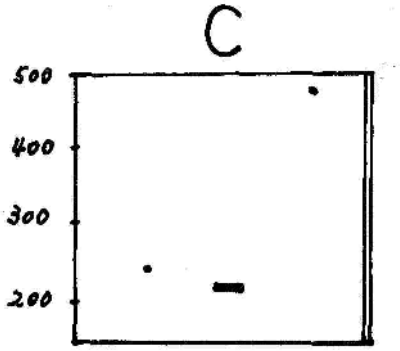
2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
Ach	A	low level	45 (narrow)

(4) cZwieb 3



, ↘Möchten Sie da net vielleicht auch diese \Som-mer- zwiebeln mit Zwie-
276 255 296 239 228 340 214 212 266 251



mit /Grün
248 235/470

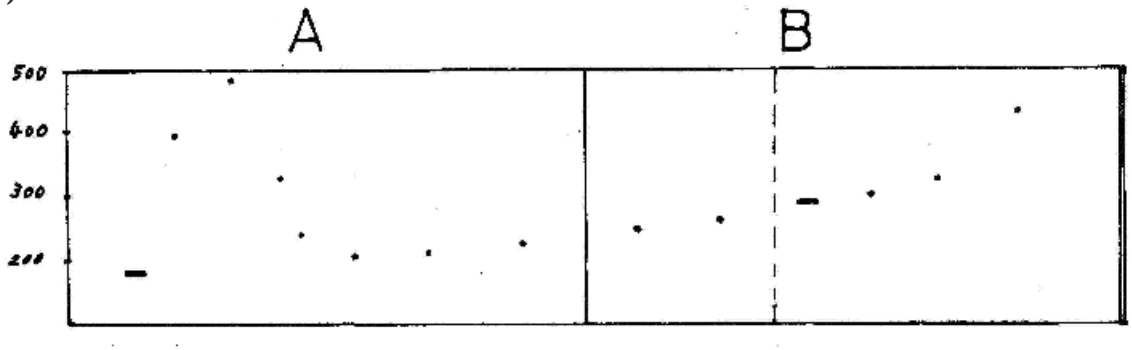
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Sommerzwiebeln	B	(mid)-high fall	steep (rising at end)	127 (wide)
Grün	C	low rise to v. high	steep	235 (v. wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
Möchten	A	low-mid falling/glissando	68 (mid-wide)

(5) cMoon 1

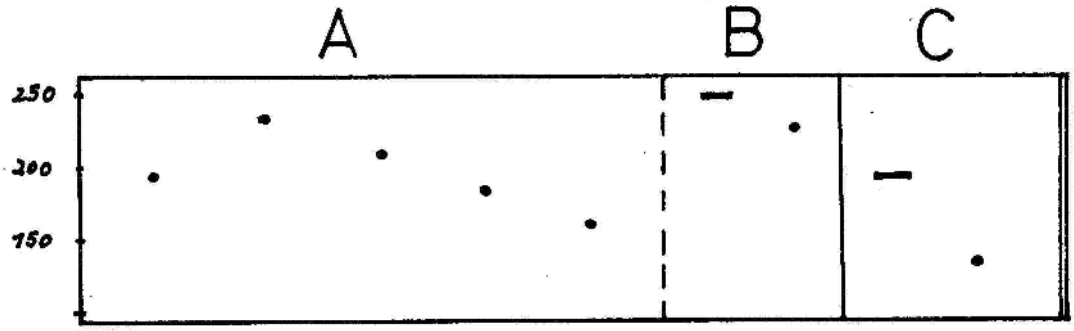


/*Ha*- ben Sie die Moon- boots noch in der ˈ*Kin*- der- grö- ße
170 399 494 313/ 208 239 252 300 330 430
222

1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Haben	A	rise-fall; low	steep	286 (v. wide)
Kindergröße	B	mid rise to high	steep	130 (wide)

(6) cGans 4



Und ”dann hab(e) ich als `*Nächs*- tes ˏ*Gans*
190 239 174 250 225 193/141

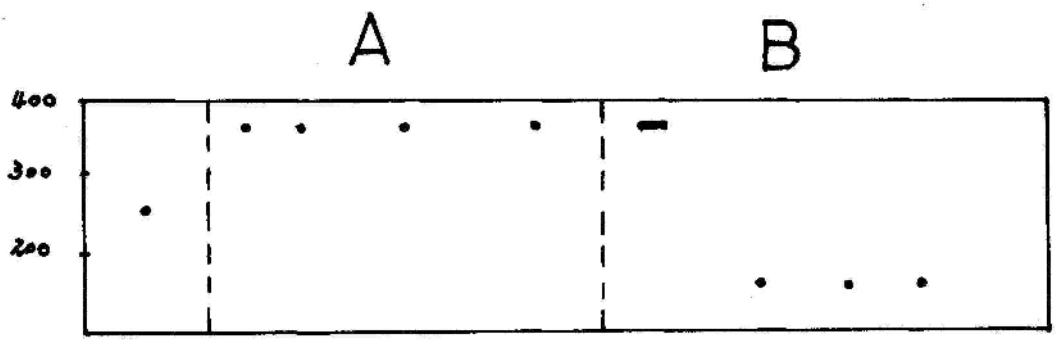
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
nächstes	B	high fall to mid-high	gentle	25 (narrow)
Gans	C	mid fall	steep	52 (mid)

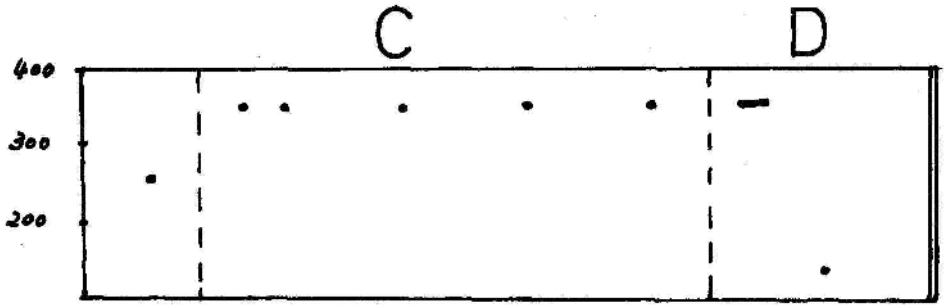
2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
dann	A	high falling	65 (mid-wide)

(7) cMango 1



°Was ”kosten denn die *Man*- gos heute
245 347 346 314 160 167



Das ”würde mich in- ter(e)- *sier-* (e)n
240 344 344 344 150

1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Mangos	B	high fall	flat tail	180 (wide)
interessieren	D	high fall	v. steep	194 (v. wide)

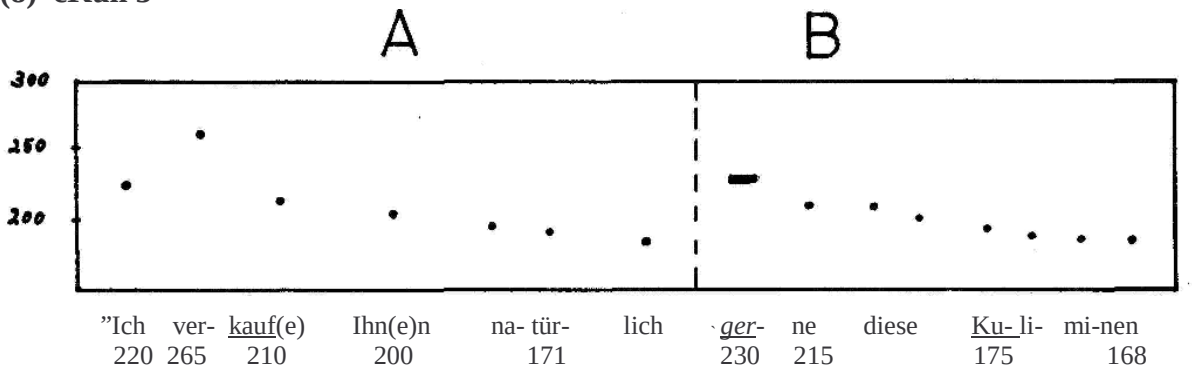
2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
kosten	A	high level	-
würde	C	high level	-

3. Prehead(s)

Word	Section	type
Was	A	low
Das	C	low

(8) cKuli 3



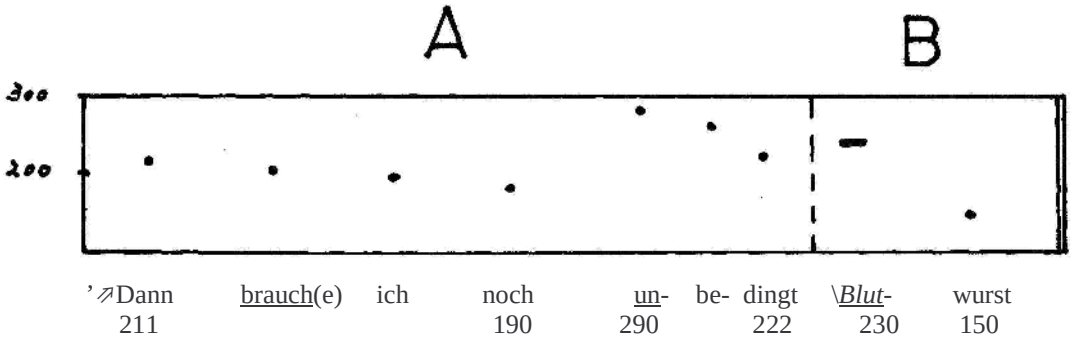
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
gerne	B	mid fall	gentle	62 (mid)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
verkaufe	A	high falling	39 (narrow)

(9) cBlut 4



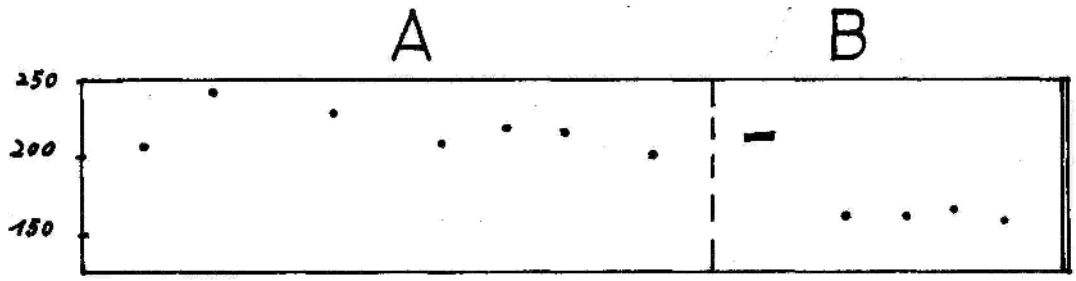
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Blutwurst	B	(mid)-high fall	steep (flat tail)	80 (mid-wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
Dann	A	mid-high rising/glissando	100 (wide)

(10) cMango 2



’↘Was ha(b)n denn Ba-na- nen und ·Man- gos gekostet
208 240 210 220 219 204 214 160 165

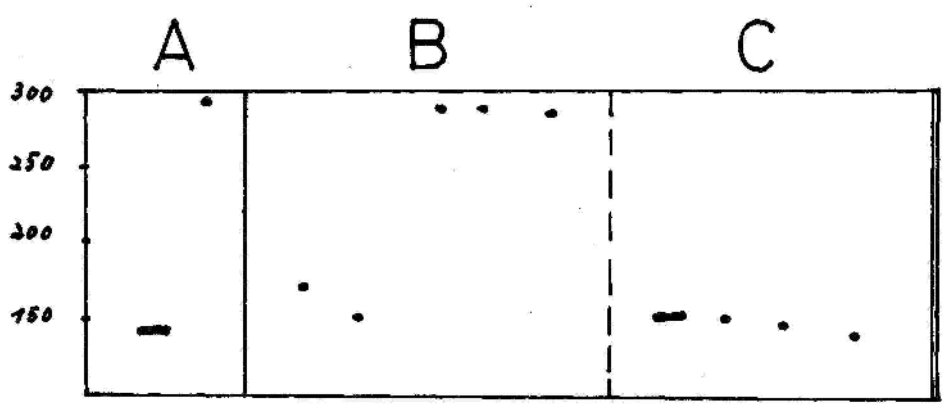
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Mangos	B	mid-(high) fall	flat tail	54 (mid)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
haben	A	(mid-high) falling/glissando	36 (narrow)

(11) cSchoko 3



/*Ja* °Schoko- ”lade und ¡*Sah*- ne- bonbons
145/291 170 150 281 281 158 137

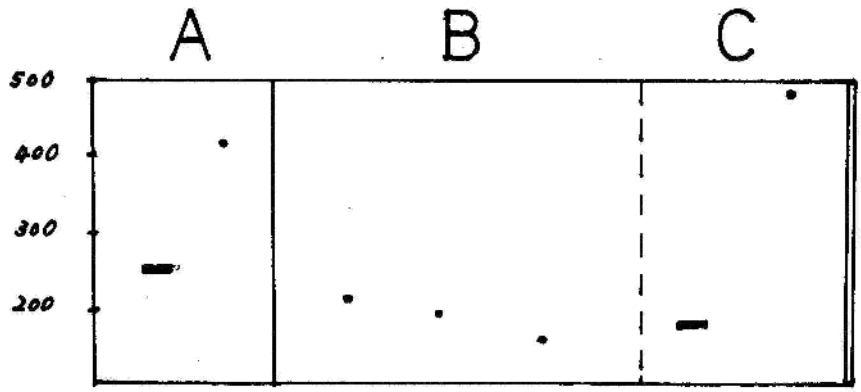
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Ja	A	low rise to high	steep	146 (wide)
Sahnebonbons	C	low (drop) gentle fall	gentle	21 (narrow)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
Schokolade	B	high level	-

(12) cBlum 1



′Hm	,und	ein	Strauß	/*Blu-*	men
250/410	208	186	163	176	484

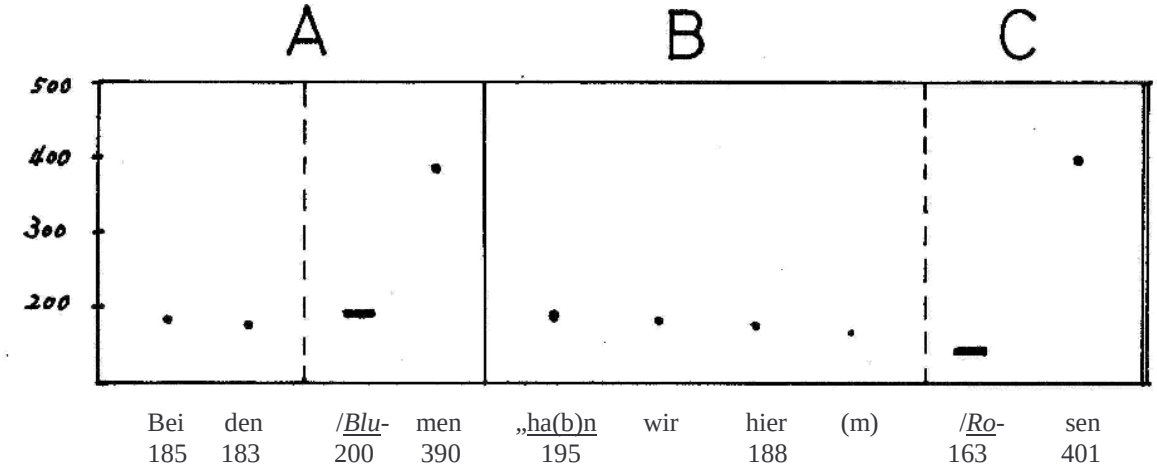
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Hm	A	mid rise to v. high	steep	160 (wide)
Blumen	C	low rise to v. high	steep	308 (v. wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
ein	B	low level	23 (narrow)

(13) cBlum 3



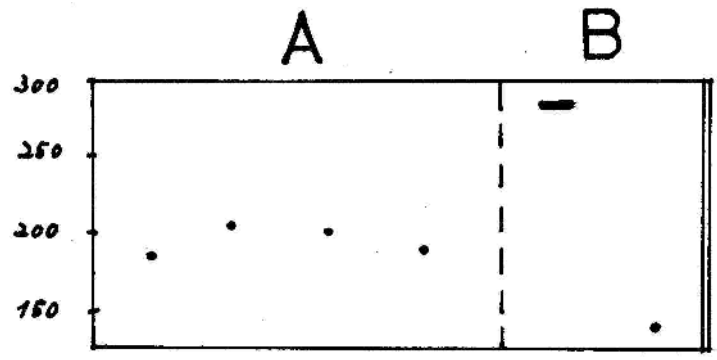
1. <u>Nuclear pitch – pattern(s)</u>

Word	Section	Type	Tail slope	Accent - range (Hz)
<u>Blu</u>men	A	low rise to v. high	steep	190 (v. wide)
<u>Ro</u>sen	C	low rise to v. high	steep	238 (v. wide)

2. <u>Head(s)</u>

Onset	Section(s)	Configuration	Freq. - range (Hz)
<u>ha</u>ben	B	low level	-

(14) cMoon 3



┬Da *ha(b)n* wir schon *Moon*- boots
180 205 200 185 285 135

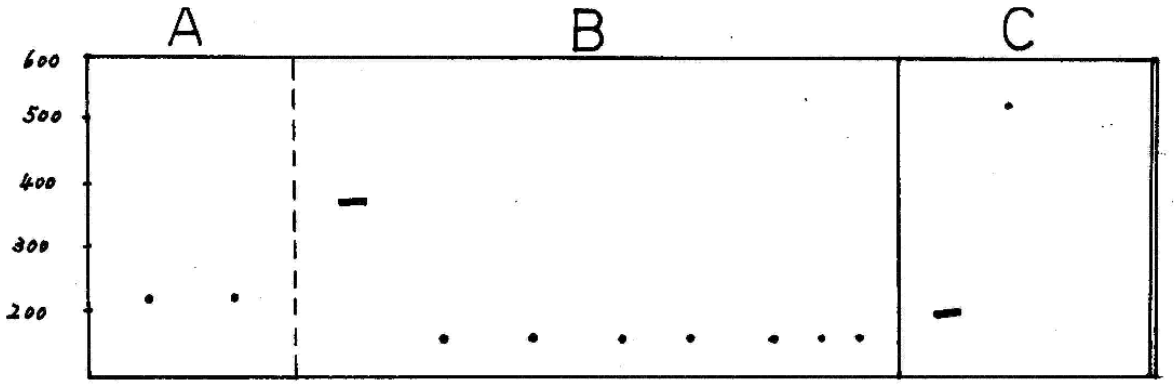
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Moonboots	B	high fall	steep (flat tail)	150 (wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
haben	A	mid level	-

(15) cMango 3

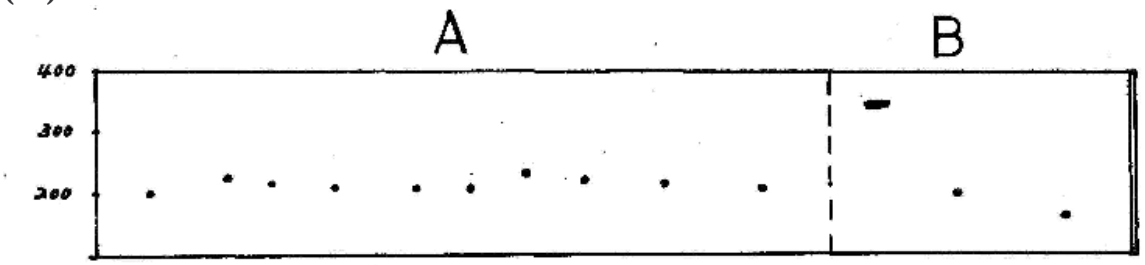


Ich glaub(e) *Man*- go war noch das an- dere /*ne*
205 205 270 150 150 150 207/524

1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Mango	B	mid-high fall to low	steep, flat tail	120 (wide)
ne	C	mid rise to v. high	steep	317 (v. wide)

(16) cSchoko 2



⊤↘Ich	wollte	doch	Schoko-	lade	für	den	*Kuch*-	en	noch
200	228	213	208	232	222	213	346	197	169

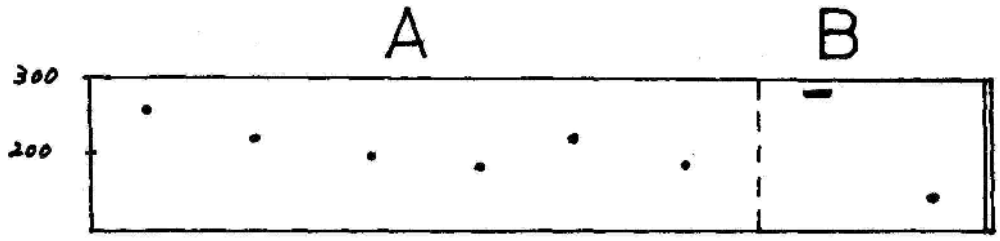
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Kuchen	B	high fall to low	steep	177 (wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
wollte	A	mid rising/glissando	17 (narrow)

(17) cBlut 3



”↘Und	schau(e)n	Sie	mal	hier	die	*Blut*-	wurst
246	225		203	235	200	285	167

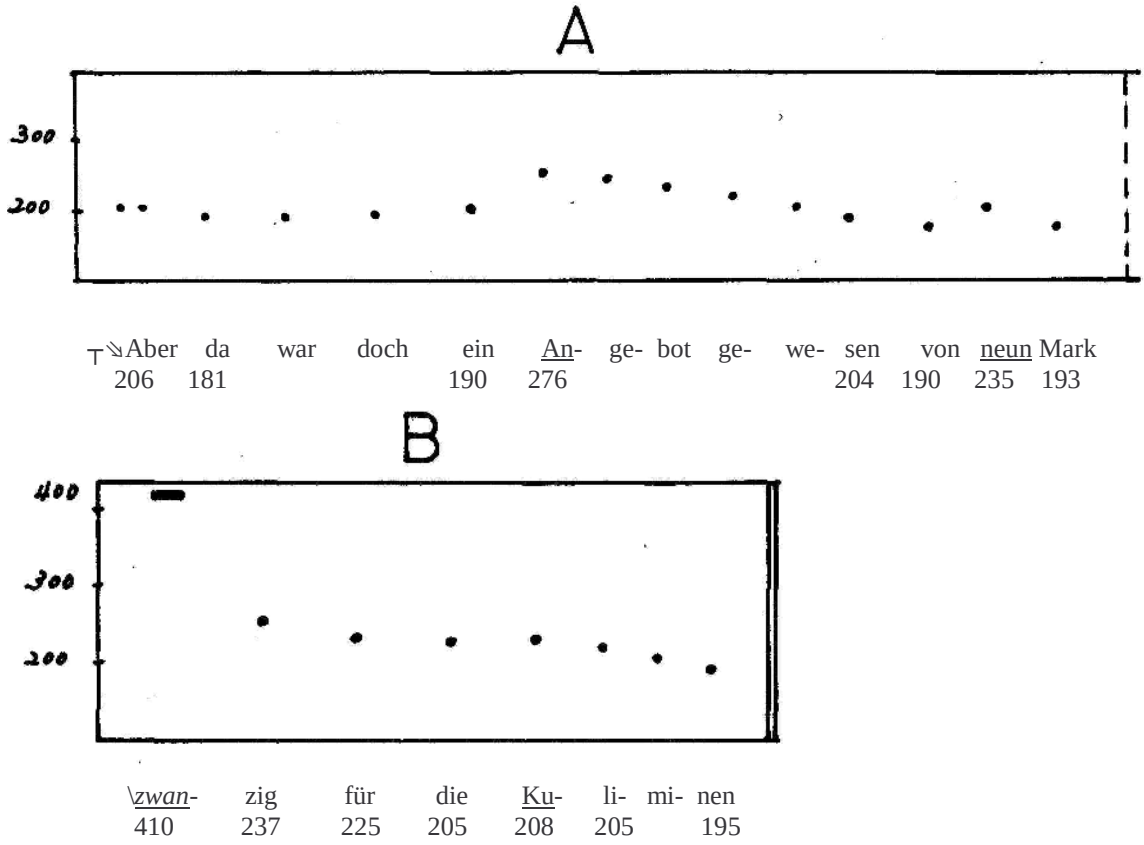
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Blutwurst	B	(mid)-high fall to low	steep (flat tail)	118 (wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
schauen	A	(mid-high) falling/glissando	25 (narrow)

(18) cKuli 2



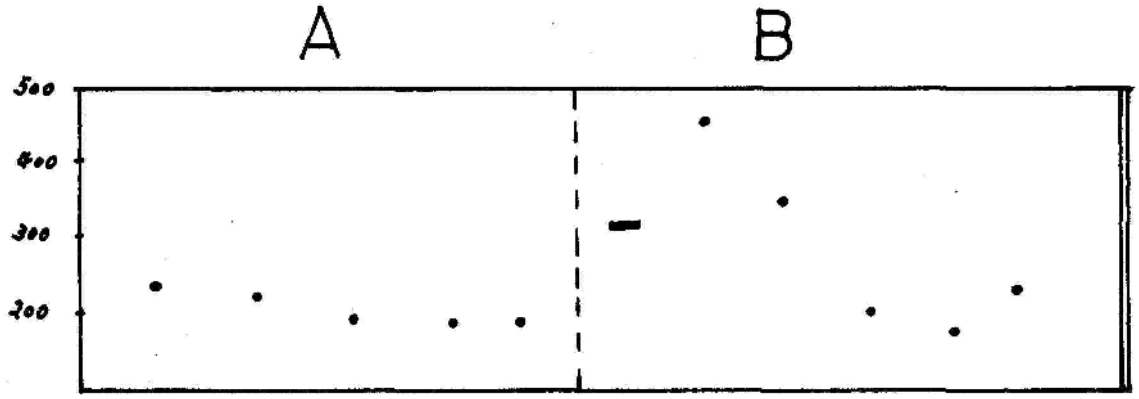
1. <u>Nuclear pitch – pattern(s)</u>

Word	Section	Type	Tail slope	Accent - range (Hz)
<u>zwan</u>zig	B	high fall to low	steep, flat tail	205 (v. wide)

2. <u>Head(s)</u>

Onset	Section(s)	Configuration	Freq. - range (Hz)
<u>An</u>gebot	A	mid falling/glissando	72 (mid-wide)

(19) cVani 2



,Hast	du	den	Va-	ni-	^*lin-*	zu-	cker	ver-	ges-	sen
230		195	190	172	302	440	320	193	160	240

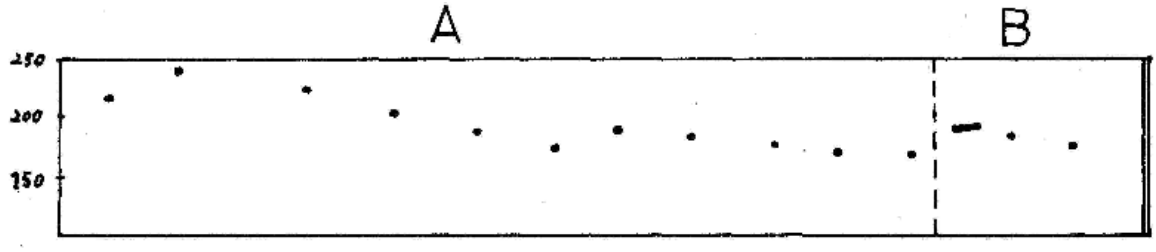
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Vanillinzucker	B	high rise-fall	steep (rising at end)	273 (v. wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
Hast	A	mid-low falling	40 (narrow)

(20) cZwieb 2



”↘Jetzt räum(e)n wir erst mal die Zwie- beln und die Ka- rot- ten weg
220 246 185 200 186 180 190 175

1. Nuclear pitch – pattern(s)

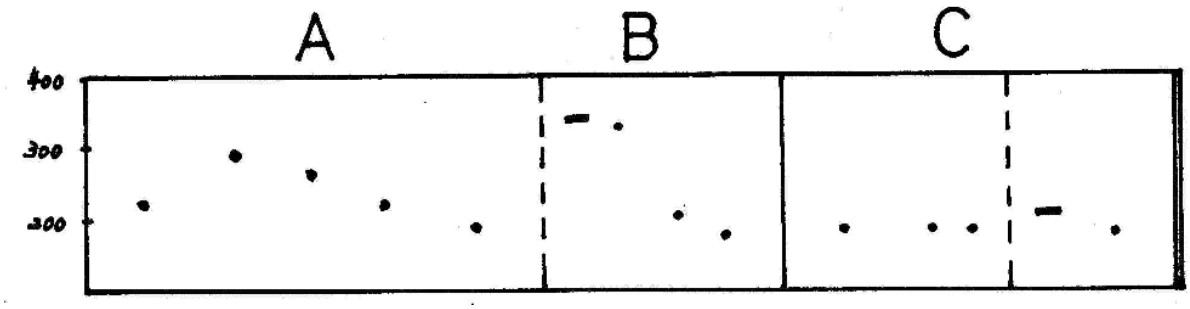
Word	Section	Type	Tail slope	Accent - range (Hz)
Karotten	B	mid-(low) fall	gentle	15 (narrow)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
räumen	A	high falling/glissando	60 (mid-wide)

German Table C: Results for intonation (Sybille:)

(1) sKuli 1



’Dann	bräuchte	ich	noch	\Kuli-	mi-	nen	für	meinen	ˏKu-	li
219	203	291		203	353	216	182	200	200	235	200

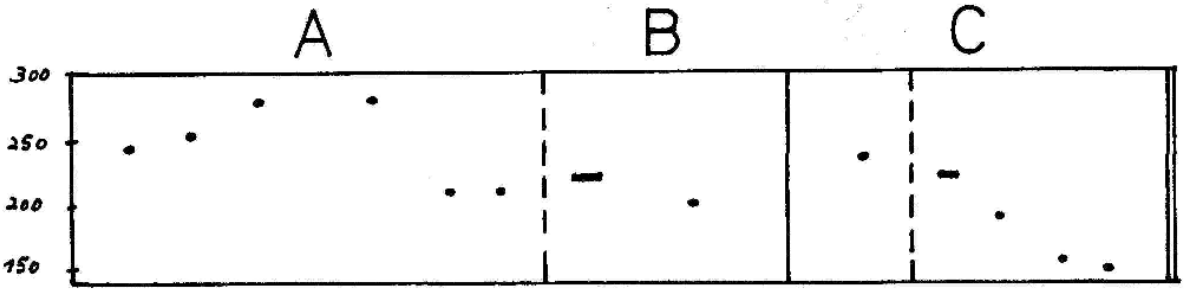
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Kuliminen	B	high fall to low	steep	171 (wide)
Kuli	C	mid-(low) fall	gentle	35 (narrow)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
bräuchte	A	mid-high falling	88 (wide)

(2) sKiwi 1



”Ja	da	hätt(e)	ich	gerne	ˋ*drei*	Stück	drei	ˋ*Ki*-	wis	bitte
246	254	276		214	220	200	232	220	170	153

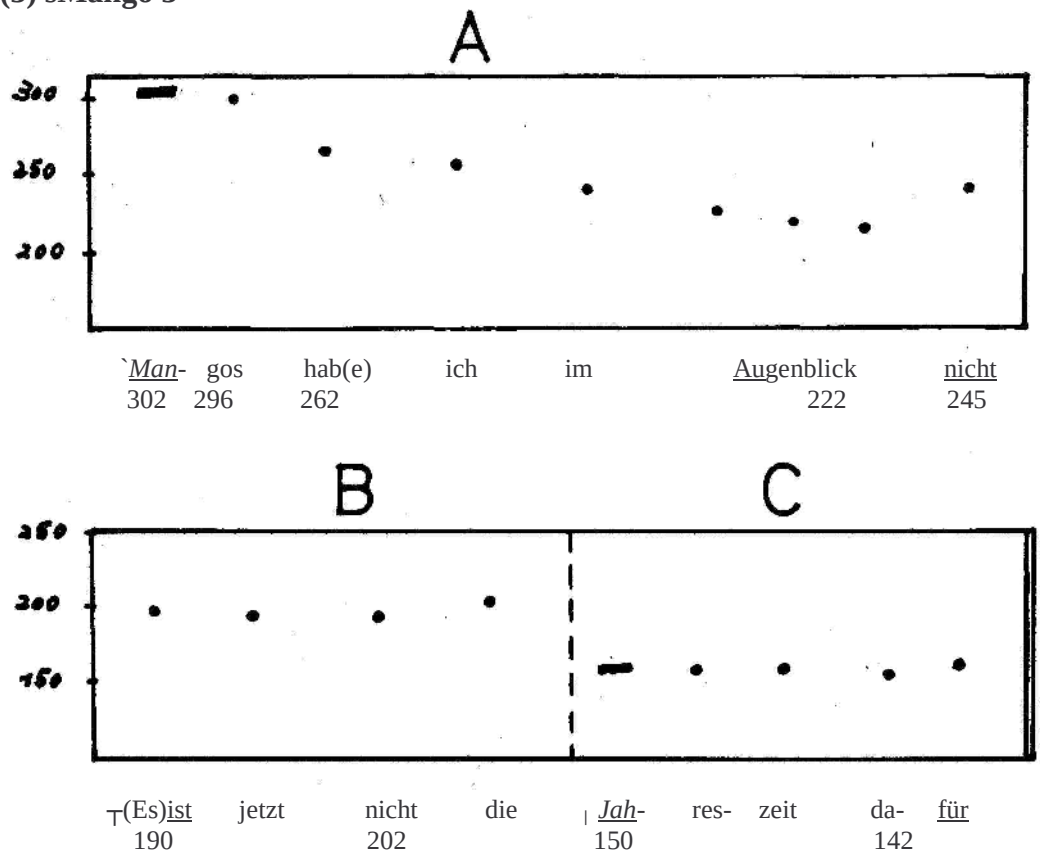
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
drei	B	mid fall to mid-low	gentle	20 (narrow)
Kiwis	C	mid fall to low	gentle	67 (mid-wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
hätte	A	high mixed	62 (mid)

(3) sMango 3



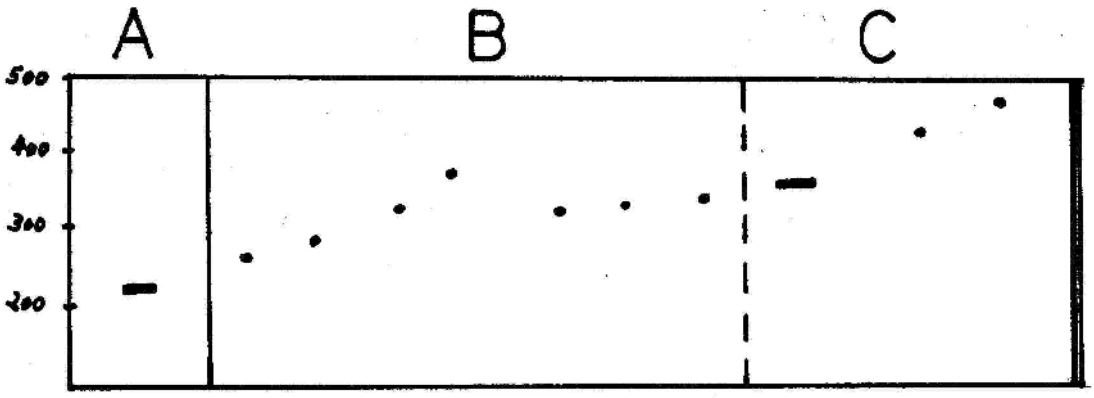
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Mangos	A	high fall to mid	gentle (rising at end)	80 (mid-wide)
Jahreszeit	C	low fall (drop)	flat	8 (narrow)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
ist	B	mid-level	-

(4) sKiwi 2



_Hm	„⇗Wie-	viel	Kiwis	hast	du	ge-	´holt	sagst	du
223	250	270	320/370	327		333	225	401	436

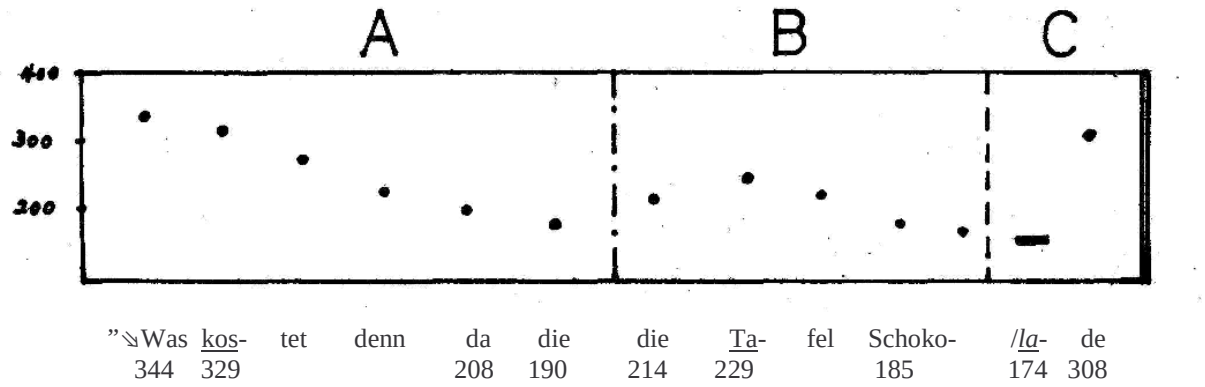
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Hm	A	low level	-	-
geholt	C	high rise to v. high	gentle	101 (wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
Wieviel	B	low rising/glissando	85 (mid-wide)

(5) sSchoko 1



”↘Was kos- tet denn da die die Ta- fel Schoko- /la- de
344 329 208 190 214 229 185 174 308

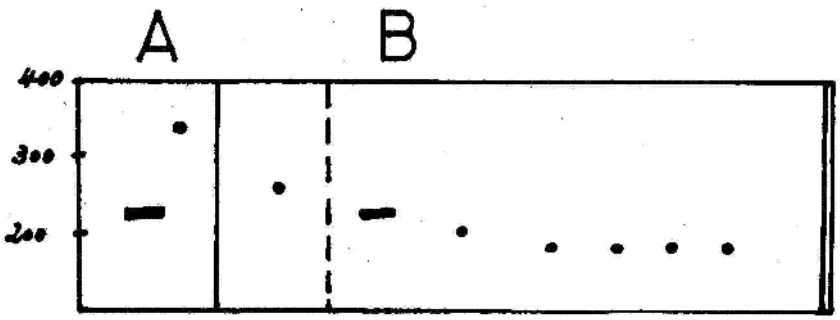
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Schokolade	C	low rise to high	steep	134 (wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
kostet	A & B	high falling/glissando	144 (wide)

(6) sKuli 4

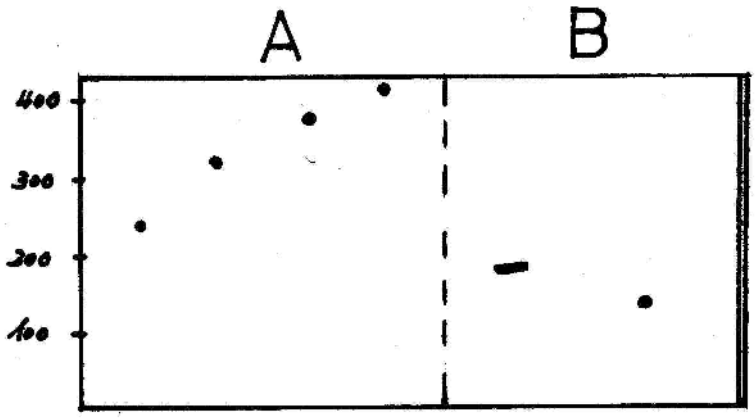


´*Hm* da `*sind* die Ku- li- mi- nen
229/340 253 229 213 190 190

1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Hm	A	mid-high rise to v. high	steep	111 (wide)
sind	B	mid fall to low	gentle	39 (narrow)

(7) sKiwi 3



┬Ki- wis hab(e) ich ¦ *auch* da
232 320 390 411 191 168

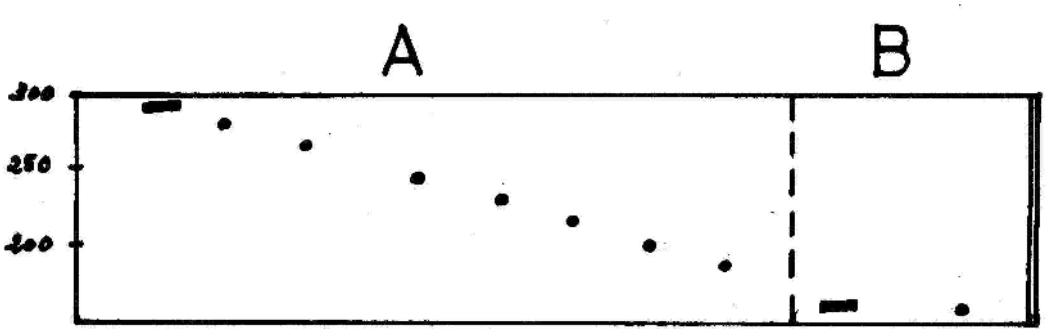
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
auch	B	low fall (drop)	gentle	23 (narrow)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
Kiwis	A	mid rising to v. high	179 (v. wide)

(8) sBlum 3

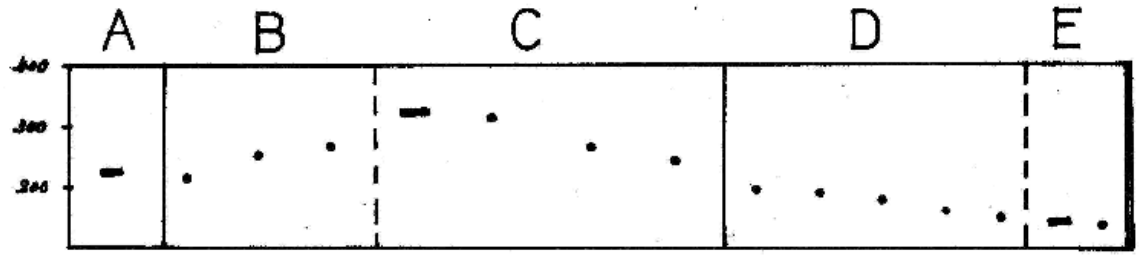


\Blu- men hab(e) ich im Au- gen- blick ˌ *nicht* da
297 280 262 170 165 150

1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Blumen	A	high fall to low	gentle	127 (wide)
nicht	B	low fall	gentle	15 (narrow)

(9) sMoon 1



┬*Gut* ┬dann nehm(e) ich `*ein* Paar Moon- boots ┬in Größe sechs und ˌ *drei*-ßig
236 219 256 271 302 291 265 239 216 214 190 177 162 156

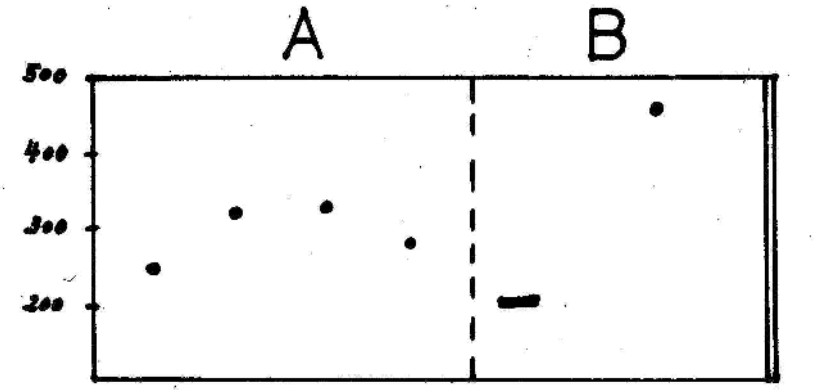
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Gut	A	mid level	-	-
ein	C	high fall to mid	gentle	285 (v. wide)
dreißig	E	low fall	gentle	6 (narrow)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
nehme	B	mid-(high) rising	15 (narrow)
Größe	D	mid-falling	390 (narrow)

(10) sKiwi 4



┬Wie- viel Ki- wis /*brauchst* du
255 302 305 276 191 440

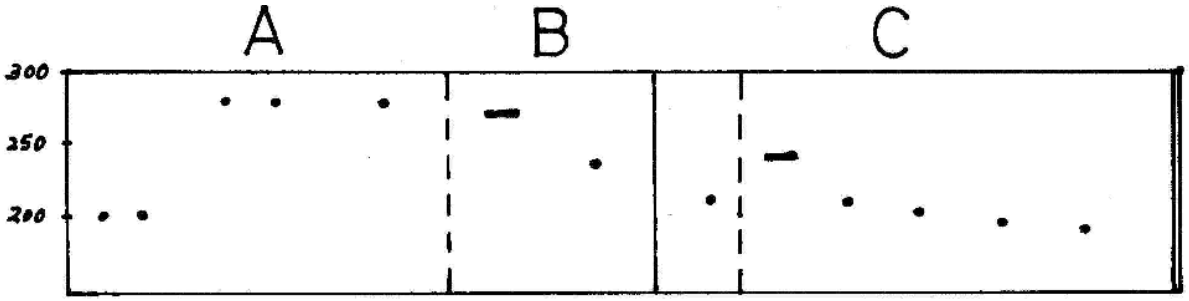
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
brauchst	B	low rise to v. high	steep	249 (v. wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
wieviel	A	mid mixed	52 (mid)

(11) sMango 4



”Also	Mango	is(t)	`*schwie*-	rig	Pa-	ˌpa-	ya	hätt(e)	ich	da
203	281		276	242	230	265	225	200	190	180

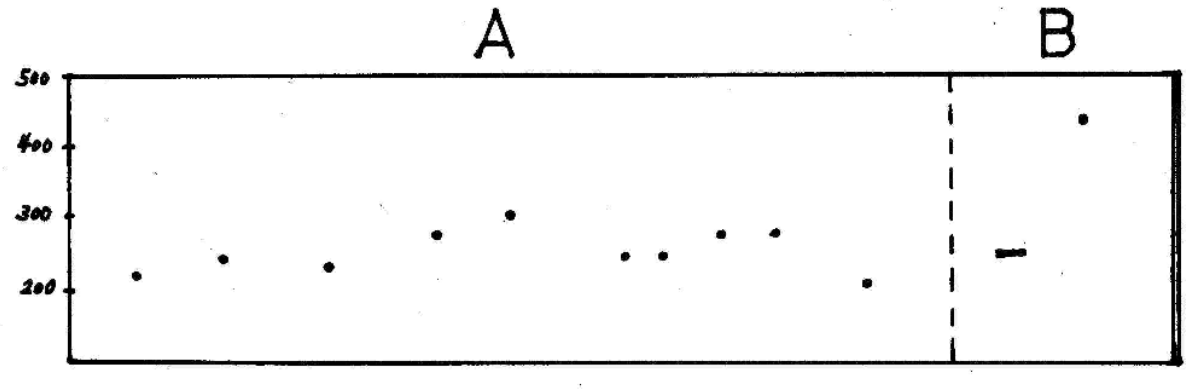
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
schwierig	B	high fall to mid	gentle	34 (narrow)
Papaya	C	mid fall to low	gentle	85 (mid-wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
Mango	A	high level	-

(12) sGans 1



,↘Kann ich dann mor- gen eine frische Gans /ha- ben
211 239 228 281 302 262 280 197 251 421

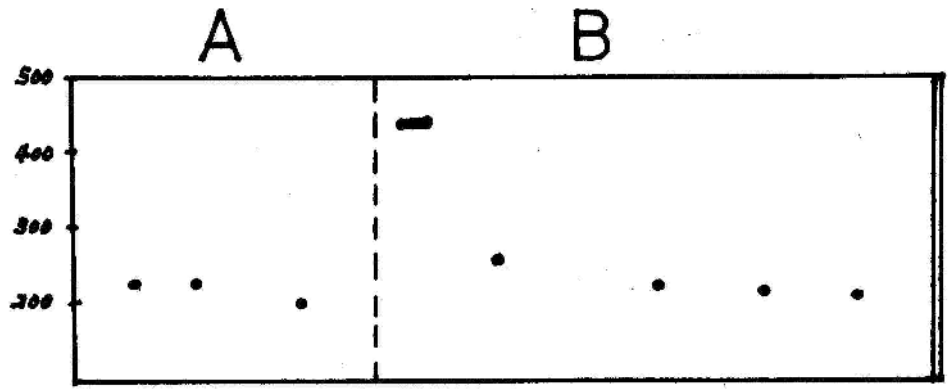
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
haben	B	low-(mid) rise to v. high	steep	170 (wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
morgen	A	mid-low falling/glissando	105 (wide)

(13) sBlum 1



„Einen Strauß *Blu- men bräucht(e) ich noch
219 190 430 230 208 205 200

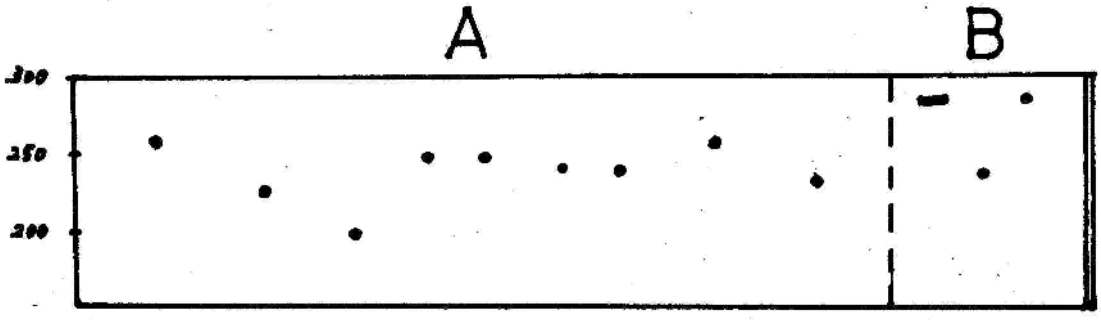
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Blumen	B	high fall to low	steep, flat tail	222 (v. wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
Einen	A	low level	-

(14) sMoon 2



⊤⇗War(e)n denn in ihrer Größe Moon- boots ˅*da*
251 229 193 250 247 258 239 286/219/286

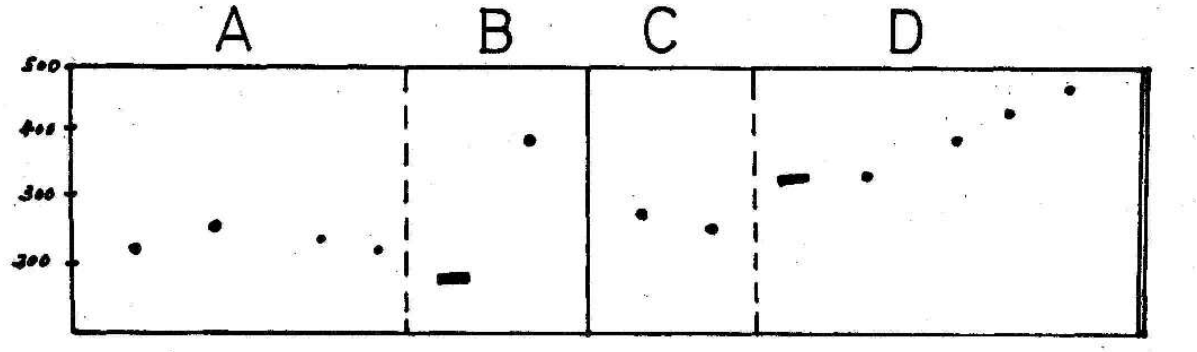
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
da	B	high fall-rise	steep	67 (mid-wide)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
Waren	A	mid-(low) rising/glissando	65 (mid-wide)

(15) sBlum 2

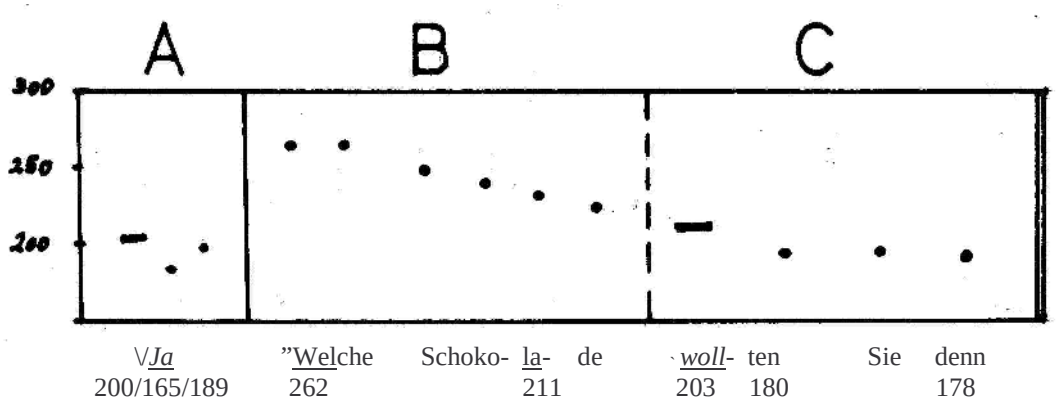


Und die (er) (er) /*Blu*- men Hast du ´*Blu*- men mit- ge- bracht
213 232 180 390 275 254 308 376 464

1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Blumen	B	low rise to high	steep	210 (v. wide)
Blumen	D	(mid)-high rise to v. high	steep	156 (wide)

(16) sSchoko 3



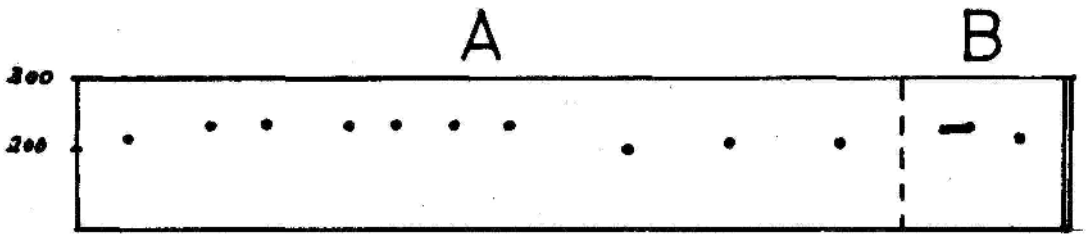
1. Nuclear pitch – pattern(s)

Word	Section	Type	Tail slope	Accent - range (Hz)
Ja	A	low fall-rise	steep	35 (narrow)
wollten	C	mid fall to low	gentle	25 (narrow)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
Welche	B	high falling	51 (mid)

(17) sSchoko 4



’Ja	wel- che	Schoko- la- de		soll	das	denn	‘*sein*
222	232		231	200	220		230/210

1. Nuclear pitch – pattern(s)

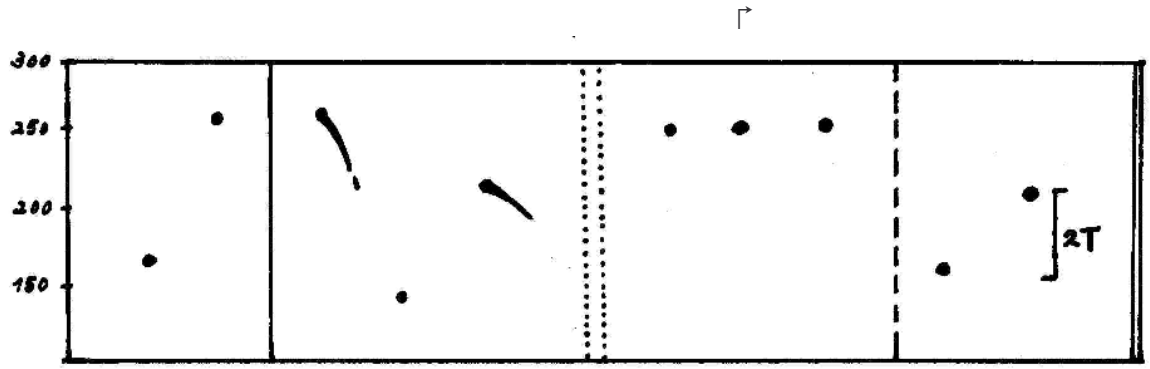
Word	Section	Type	Tail slope	Accent - range (Hz)
sein	B	high fall to mid-high	gentle	20 (narrow)

2. Head(s)

Onset	Section(s)	Configuration	Freq. - range (Hz)
Welche	A	mixed mid-high	ca. 10 (narrow)

Chinese Table C: Results for intonation (You: pages 146-162)

(1) yLong 3



Hao^{3}	ba^{0}.	Na^{4}	wo^{3}	yao^{4}	*yi*^{1}	*gong*^{1}-	*jin*^{1}	long^{3}-	xia^{1}
162	258	258/ 208	143	216/(155)	250		246	170	220

1. Declination (Hz): 162 (hao^{3}) — 143 (wo^{3}) = 19*:2 = 9.5

2. Mean tonal band-width (Hz):

162 (hao^{3}) — 258 (na^{4})	=	96	
258 (na^{4}) — 143 (wo^{3})	=	115	
143 (wo^{3}) — 216 (yao^{4})	=	73	= 82
246 (jin^{1}) — 170 (long^{3})	=	76	
170 (long^{2}) — 220 (xia^{1})	=	50	

3. Final freq. -range (Hz): 170 (long^{3}) — 220 (xia^{1}) = 50

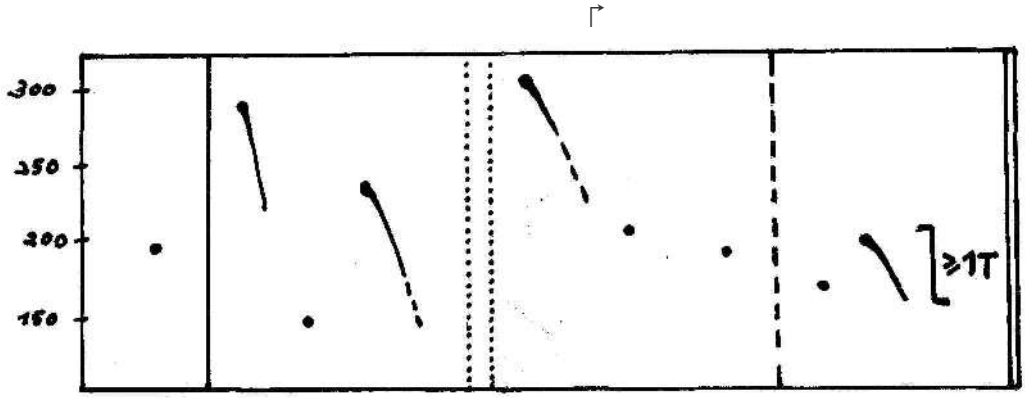
4. Caudal tonal behavior: 170 (long^{3}) — 220 (xia^{1}) = 50 Hz = 2.5 tones (rise)

5. Focal tonal behavior:

246 (jin^{1}) — 170 (long^{3}) = 76 Hz ≥ 4 tones (fall)
170 (long^{3}) — 220 (xia^{1}) = 50 Hz = 2.5 tones (rise)

Notes:
(1) There is an *upshift* after *yao*^{4}. Due to a lack of further reference-points, declination could not be determined beyond this point in the speech sample and the indicated result is only an approximation.

(2) yLu 3



Hao^{3}. Na^{4} wo^{3} yao^{4} *ban*^{4} gong$^{1°}$- jin$^{1°}$ lu^{3}- rou^{4}
190 282/ 217 150 232/150 302/230 219 205 180 203/176

1. Declination (Hz): --

2. Mean tonal band-width (Hz):

282 (na^{4}) — 150 (wo^{3})	=	132
150 (wo^{3}) — 232 (yao^{4})	=	82
302 (ban^{4}) — 205 (jin$^{1°}$)	=	97
180 (lu^{3}) — 203 (rou^{4})	=	23

= 83.5

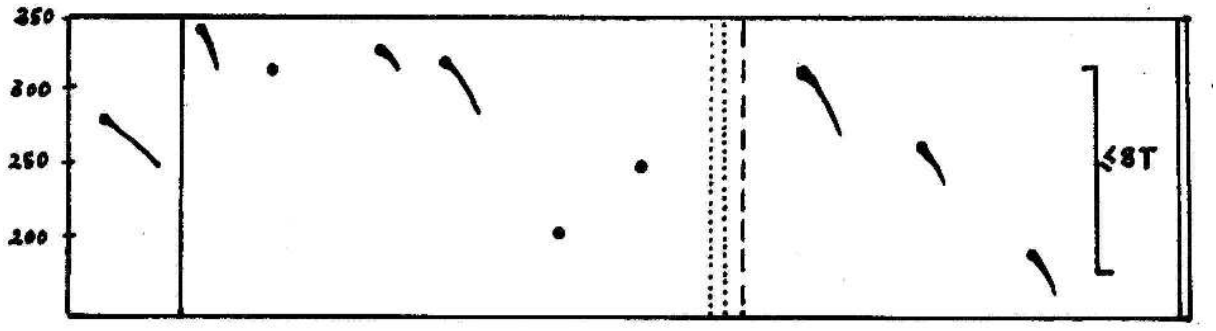
3. Final freq. -range (Hz): 180 (lu^{3}) — 203 (rou^{4}) = 23 Hz

4. Caudal tonal behavior:
180 (lu^{3}) — 203 (rou^{4}) = 23 Hz ≥ 1 tone (rise)
203-176 (rou^{4}) = 27 Hz ≥ 1 tone (slope)

5. Focal tonal behavior:
205 (jin^{1}) — 180 (lu^{3}) = 25 Hz ≥ 1 tone (fall)
180 (lu^{3}) — 203 (rou^{4}) = 23 Hz ≥ 1 tone (rise)
203-176 (rou^{4}) = 27 Hz ≥ 1 tone (slope)
232 (yao^{4}) — 302 (ban^{4}) = 70 Hz ≥ 3 tones (rise)
302-230 (ban^{4}) = 72 Hz < 3.5 tones (slope)

Notes:
(1): There is an *upshift* after *yao*^{4}. As there are reference-points in the second half of the speech sample, declination here was determined on the basis of these and the final result consists of both calculated values. It must be noted, however, that the accuracy of the second calculation, based on *jin*$^{1°}$ is unclear, as the exact relation between a neutralized 1st tone and the bottom line was unclear.

(3) yLizhi 4



Ah	li^{4}- zhi$^{1°}$	xian$^{4°}$- zai^{4}	yi^{3}- jing^{1}	*shang^{4}*- *shi^{4}*	le^{0}
271/205	344/ 313 302	325/ (262) 320/239	202 250	308/232 262/203	190/152

1. Declination (Hz): 202 (yi^{3}) — 152 (le^{0}) = 50*: 4= 12.5

2. Mean tonal band-width (Hz):

344 (li^{4}) — 202 (yi^{3})	=	142
320 (zai^{4}) — 202 (yi^{3})	=	118
202 (yi^{3}) — 250 (jing^{1})	=	48
308 (shang^{4}) — 190 (le^{0})	=	118

= 106.5

3. Final freq. -range (Hz):

308 (shang^{4}) — 190 (le^{0})	=	118
262 (shi^{4}) — 190 (le^{0})	=	72

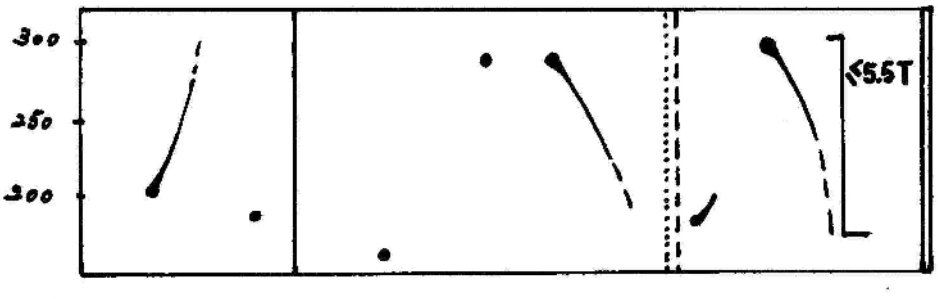
= 118/72

4. Caudal tonal behavior: 190-152 (le) = 38 Hz $\leq$ 2 tones (fall)

5. Focal tonal behavior: 308(shang^{4}) — 190 (le^{0}) = 118 Hz $\leq$ 6 tones (overall fall)
190-152 (le) = 38 Hz $\leq$ 2 tones (fall)
$\leq$ 6 tones (fall) & $\leq$ 2 tones (fall): together $\leq$ 8 tones (overall fall)

Notes:
(1) There is a pause in this speech sample after *jing^{1}*. However, given the pitch-heights of the following *shang^{4}* and *shi^{4}*, which - allowing for downdrift – seem to fit perfectly into the overall contour of the utterance, it is judged here that no *upshift* took place. Thus only one calculation of declination was made for this speech sample.

(4) yMing 3



Ming^{2} - zhi^{3} wo^{3} *xu^{1}*- *yao^{4}* *yi^{2}* *fen^{4}*
200/300 180 158 276 276/190 172/200 280/171

1. Declination (Hz): 180 (zhi^{3}) — 158 (wo^{3}) ≥ 22*: 2= 11.0

2. Mean tonal band-width (Hz):
300 (ming^{2}) — 158 (wo^{3}) = 142
158 (wo^{3}) — 276 (xu^{1}) = 118 ≥ 122.6*
172 (yi^{2}) — 280 (fen^{4}) ≥ 108

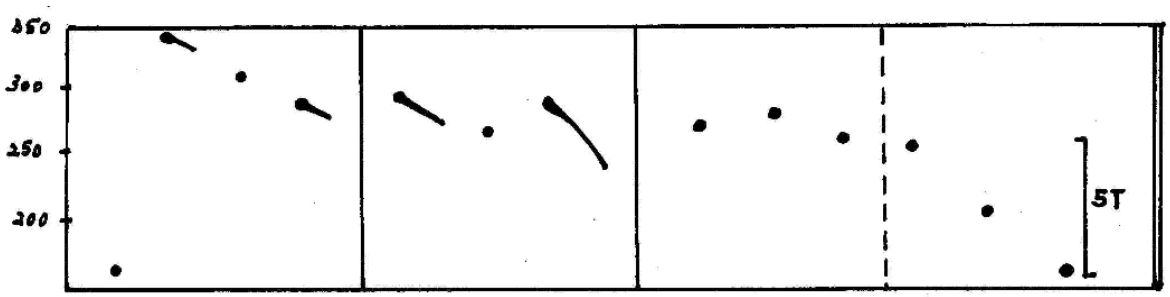
3. Final freq. -range (Hz): 172 (yi^{2}) — 280 (fen^{4}) = 108

4. Caudal tonal behavior: 280-171(fen^{4}) = 109 Hz ≤ 5.5 tones (slope)

5. Focal tonal behavior:
172 (yi^{2}) — 280 (fen^{4}) = 108 Hz ≤ 5.5 tones (rise)
280-171(fen^{4}) = 108 Hz ≤ 5.5 tones (slope)
276 (yao^{4}) — 172 (yi^{2}) = 104 Hz ≥ 5.0 *Tones* (fall)

Notes:
(1) As there are not enough reference points for the calculation of declination beyond *yao^{4}*, the indicated result is only an approximation. Calculation of declination based on the frequency of ming^{2} (200) and yi^{2} (172) yielded the result of 28 Hz.

(5) yLizhi 2



Ni^{3}	kan^{4}	yi$^{2°}$	xia^{4}	dui^{4}	yi$^{2°}$	xia^{4}	zhe^{4}	li^{4}-	zhi^{1}	*duo*^{1}-	*shao*$^{3/2°}$-	*qian*$^{2°}$
162	347/ 339	302	271	296/270	258	291/225	286	290	267	262	208	160

1. Declination (Hz): 162 (ni^{3}) — 160 (qian$^{2°}$) ≥ 2* : 4= 0.5

2. Mean tonal band-width (Hz):

162 (ni^{3}) — 347 (kan^{4})	=	185
162 (ni^{3}) — 291 (xia^{4})	=	129
290 (li^{4}) — 160 (qian$^{2°}$)	=	130
262 (duo^{1}) — 160 (qian$^{2°}$)	=	102

= 136.5

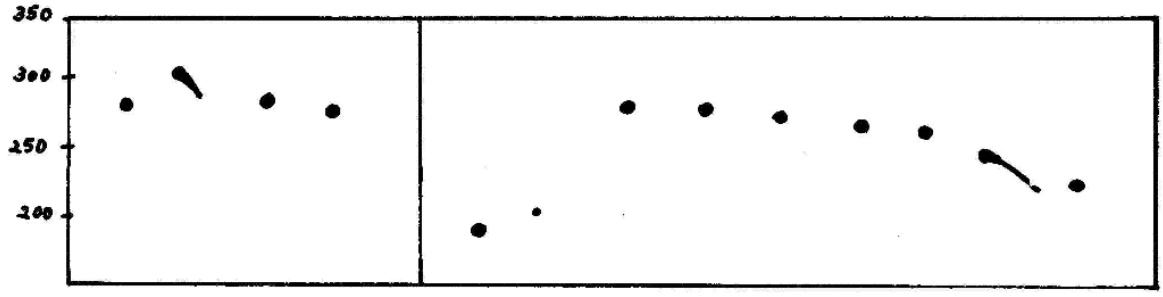
3. Final freq. -range (Hz): 262 (duo^{1}) — 160 (qian$^{2°}$) = 102

4. Tonal behavior of final tone/particle: 208(shao$^{3/2}$) — 160 (qian$^{2°}$) = 48 Hz ≤ 2.5 *Tones* (fall)

5. Tonal behavior of final tone-unit: 262 (duo^{1}) — 160 (qian$^{2°}$) = 102 Hz = 5 *Tones* (overall fall)

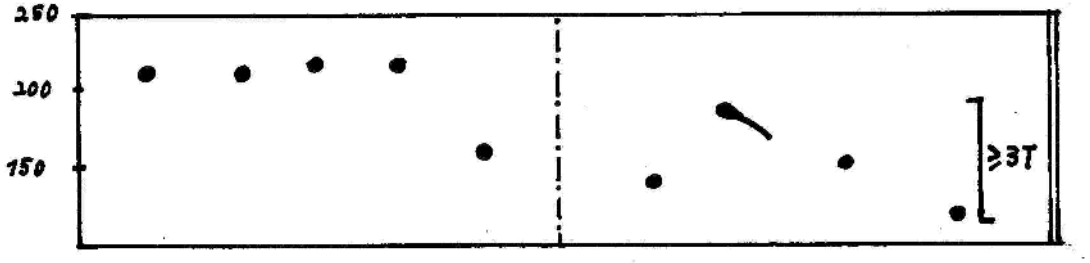
Notes:
(1) In this speech sample, given the almost exclusive presence of 1st and 4th tones, whose tonal slopes are reduced due to fast speech tempo, it was not clear how to calculate declination, especially as the contribution of the initial *ni*^{3} to declination was unclear. The accuracy of the indicated result is therefore uncertain.

(6) yLa 2



Na^{4} *la*^{4}- *jiao*^{1} ne
277 308/270 268 258

Wo^{3}- men^{0} *jin*^{1}- *tian*^{1} zuo^{4} cai^{4} yao^{4} la^{4}- jiao$^{1\circ}$
186 (213) 281 271 266 254/229 235



Ni$^{3/2}$ *you*$^{3/2\circ}$ *mei*$^{2\circ}$ *you*$^{3/2\circ}$ mai^{3} mai^{3} *la*^{4}- *jiao*$^{1\circ}$ ah
211 211 216 216 169 157 198/170 163/160 132

1. Declination (Hz): 186 (wo^{3}) — 132 (ah^{o}) ≥ 54*: 3= 18.0

2. Mean tonal band-width (Hz):

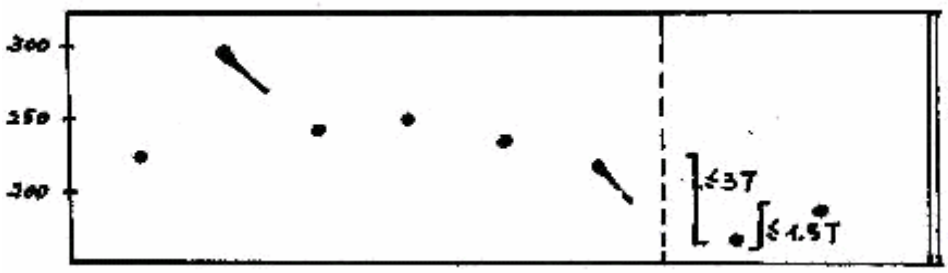
186 (wo^{3}) — 281 (jin^{1})	=	95	= 61.5
186 (wo^{3}) — 254 (la^{4})	=	66	
211 (you$^{3/2/1\circ}$) — 169 (mai^{3})	=	42	
155 (mai^{3}) — 198 (la^{4})	=	43	

3. Final freq. -range (Hz): 155 (mai^{3}) — 198 (la^{4}) = 43

4. Tonal behavior of final tone/particle: 160 (jiao$^{1\circ}$) — 132 (ah) = 28 Hz ≤ 1.5 tones (fall)

5. Tonal behavior of final tone-unit:
155 (mai^{3}) — 198 (la^{4}) = 43 Hz ≥ 2 tones (rise)
198 (la^{4}) — 132 (ah) = 66 Hz ≥ 3 tones (overall fall)

(7) yLong 2



Ni^{3}	<u>*wei*</u>^{4}-	<u>*shem*</u>^{2}-	<u>*ma*</u>^{0}	yao^{4}	<u>mai</u>$^{3/2}$	long^{3}-	xia^{1}
228	293/279	242	243	233	220	256	184

1. Declination (Hz): 228 (ni^{3}) — 156 (long^{3}) = 72: 4 = 18.0

2. Mean tonal band-width (Hz):

228 (ni^{3}) — 295 (wei^{4})	=	67
233 (yao^{4}) — 156 (long^{3})	=	77
156 (long^{3}) — 184 (xia^{1})	=	28

= 57.3

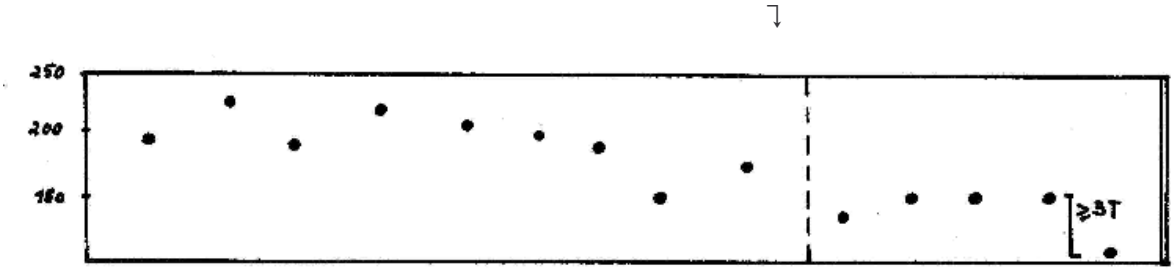
3. Final freq. -range (Hz): 156 (long^{3}) — 184 (xia^{1}) = 28

4. Tonal behavior of final tone/particle: 156 (long^{3}) — 184 (xia^{1}) = 28 Hz $\leq$ 1.5 tones (rise)

5. Tonal behavior of final tone-unit:

220 (mai$^{3/2}$) — 156 (long^{3})	=	64 Hz	$\leq$ 3 tones (fall)
156 (long^{3}) — 184 (xia^{1})	=	28 Hz	$\leq$ 1.5 tones (rise)

(8) yMan 2



Ming^{2}- tian^{1} zao^{3}- shang^{4} yao^{4} chi^{1} de^{0} <u>*man*</u>^{2}- <u>*tou*</u>$^{2°}$ ni^{3} <u>you</u>$^{3/2}$ <u>mei</u>^{2} <u>you</u>$^{3/2}$ <u>mai</u>$^{3°}$
188 239 193 235 214 205 198 168 182 159 180 180 114

1. Declination (Hz): 193 (zao^{3}) — 114 (mai^{3}) = 79: 4 = 19.75

2. Mean tonal band-width (Hz):

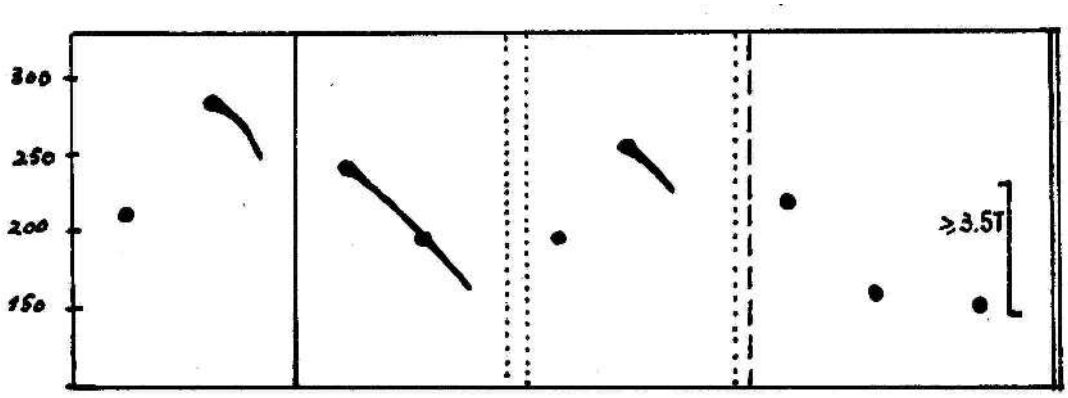
239 (tian^{1}) — 193 (zao^{3})	=	46	
193 (zao^{3}) — 235 (shang^{4})	=	42	≥ 42.5
168 (man^{2}) — 182 (tou$^{(4)}$)	≥	14	
182 (you$^{3/2}$) — 114 (mai^{3})	=	68	

3. Final freq. -range (Hz): 182 (you$^{3/2}$) — 114 (mai^{3}) = 68

4. Tonal behavior of final tone/particle: 182 (you$^{3/2}$) — 114 (mai^{3}) = 68 Hz ≥ 3 tones (fall)

5. Tonal behavior of final tone-unit: 182 (you$^{3/2}$) — 114 (mai^{3}) = 68 Hz ≥ 3 tones (fall)

(9) yLu 2



Ran^{2}- hou^{4} zhe^{4}- ge^{0} *lu*^{3}- *rou*^{4} duo^{1}- shao$^{3/2°}$- qian$^{2°}$
207 276/246 239 (170) 198 258/(188) 225 160 150

1. Declination (Hz): 198 (lu^{3}) — 150 (qian$^{2°}$) ≥ 48*: 2= 24.0

2. Mean tonal band-width (Hz):

239 (zhe^{4}) — 170 (ge^{0})	≥	69
198 (lu^{3}) — 258 (rou^{4})	=	60
225 (duo^{1}) — 150 (qian$^{2°}$)	=	75

≥ 68

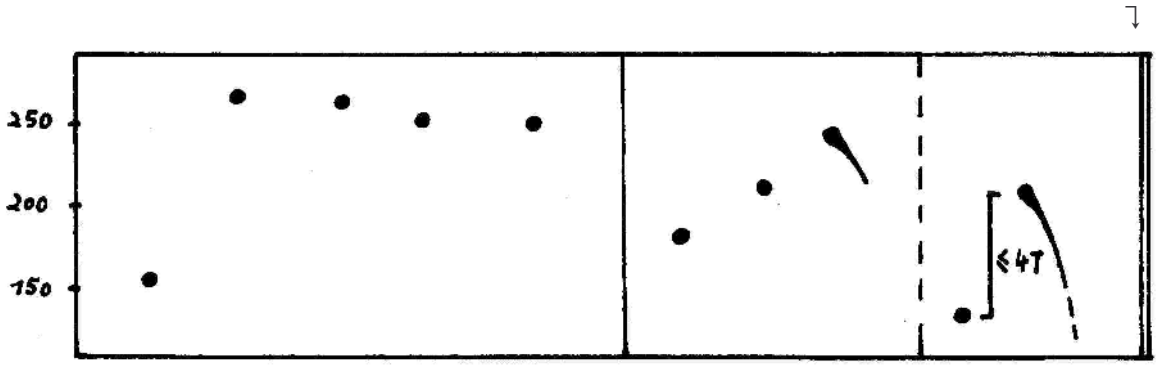
3. Final freq. -range (Hz): 225 (duo^{1}) — 150 (qian$^{2°}$) = 75

4. Tonal behavior of final tone/particle: 160 (shao$^{3/2}$) — 150 (qian$^{2°}$) = 10 Hz = 0.5 tone (fall)

5. Tonal behavior of final tone-unit: 225 (duo^{1}) — 150 (qian$^{2°}$) = 75 Hz ≥ 3.5 tones (overall fall)

Notes:
(1) There is an upshift after *ge*. As the contribution of the preceding part of the speech sample to declination is unclear and there are also not enough reference points here, this initial part of the speech sample was excluded from calculations of declination. Since it carries a 2nd tone and is also very strongly reduced, it was thought that the initial *ran*^{2} could not serve as a reference point for declination. There seems to be a downshift after rou^{4}.

(10) yLong 1



Long^{3}- xia^{1} yi^{1} gong^{1}- jin^{1} cai$^{2°}$ *shi*^{2}- *er*^{4} ma^{3}- ke^{4}
150 276 275 254 250 168 210 247/216 137 219/131

1. Declination (Hz): 150 (long^{3}) — 137 (ma^{3}) = 13: 2 = 7.5

2. Mean tonal band-width (Hz):

150 (long^{3}) — 276 (xia^{1})	=	126
150 (long^{3}) — 275 (yi^{1})	=	125
247 (er^{4}) — 137 (ma^{3})	=	110
137 (ma^{3}) — 219 (ke^{4})	=	82

= 110.8

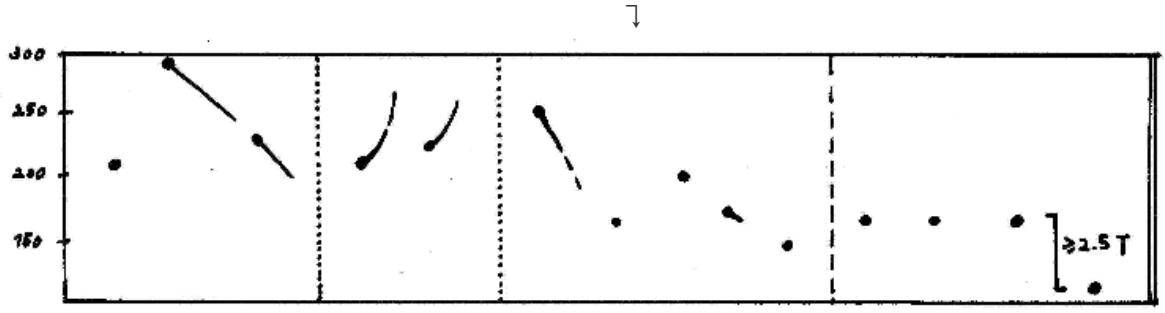
3. Final freq. -range (Hz): 137 (ma^{3}) — 219 (ke^{4}) = 82

4. Caudal tonal behavior: 219-131 (ke^{4}) = 88 Hz $\leq$ 4.5 tones (slope)

5. Focal tonal behavior:
137 (ma^{3}) — 219 (ke^{4}) = 82 Hz $\leq$ 4 tones (rise)
219-131 (ke^{4}) = 82 Hz $\leq$ 4.5 tones (slope)
247 (er^{4}) — 137 (ma^{3}) = 110 Hz = 5.5 Tones (fall)

Notes:
(1) There seems to be a downshift after er^{4}.

(11) yLing 2



Ni^{3}	zhe^{4}-	ge^{0}	*ling*^{2}-	*meng*^{2}	zher^{4}	mai^{3}	*duo*^{1}-*shao*$^{3/2}$-	*qian*$^{2°}$	yi^{1}	gong^{1}-	jin^{1}	ah^{0}
205	296	(200)	211	220	250/176	260	208	182	152	174	170	170	120

1. Declination (Hz): 260 (mai^{3}) — 120 (ah^{o}) ≥ 60*: 3= 20.0

2. Mean tonal band-width (Hz):

205 (ni^{3}) — 296 (zhe^{4})	=	91	
250 (zher^{4}) — 170 (mai^{3})	=	80	= 75.6
208 (duo^{1}) — 152 (qian$^{2°}$)	=	56	

3. Final freq. -range (Hz): 174 (yi^{1}) — 120 (ah^{0}) = 54

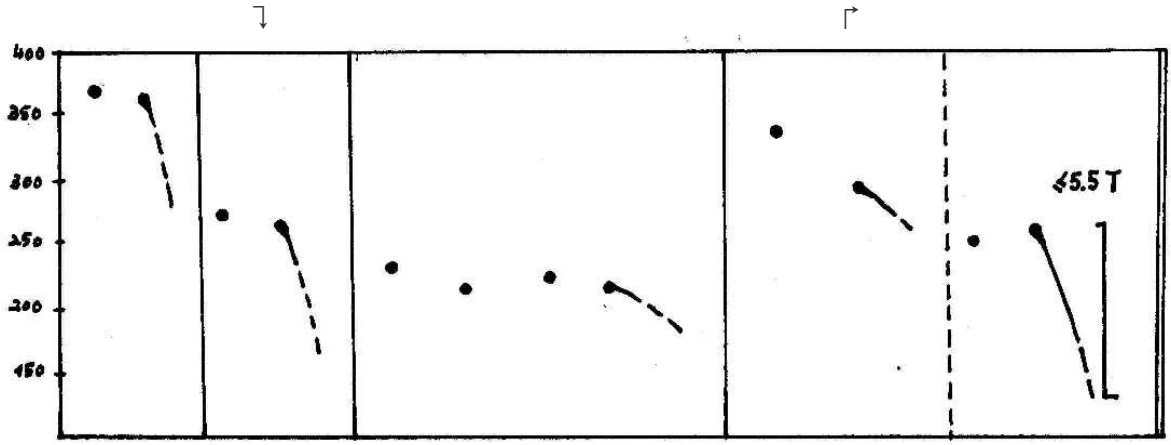
4. Tonal behavior of final tone/particle: 170 (jin^{1}) — 120 (ah^{0}) = 50 Hz = 2.5 tones (fall)

5. Tonal behavior of final tone-unit:

208 (duo^{1}) — 152 (qien$^{2°}$)	= 56 Hz	≦ 3 *Tones*	(overall fall)
170 (jin^{1}) — 120 (ah^{0})	= 50 Hz	= 2.5 *Tones*	(fall)

Notes:
(1) There is a slight pause after ge^{0} and a pause after *meng*^{2}. As the the initial frequency of *zher*^{4} is only slightly below that of the final frequencies of *ling*^{2} and *meng*^{2} - allowing for downdrift - it was concluded that there is no upshift here. Therefore, only one calculation of declination was made here.

(12) yDang 1



Xin[1]- xian[1°] Xin[1]- xian[1°] Dang[1]-ran[2°] xin[1]- xian[1°] Xian[4°]- zai[4] *dang*[1]- *ji*[4]
380 364/272 267 262/163 242 220 239 211/182 340 289/240 242 250/142

1. Declination (Hz): --

2. Mean tonal band-width (Hz):

380 (xin[1]) — 163 (xian[1°])	=	217	
267 (xin[1]) — 163 (xian[1°])	=	104	= 119.5*
239 (xin[1]) — 182 (xian[1°])	=	57	
242 (dang[1]) — 142 (ji[4])	=	100	

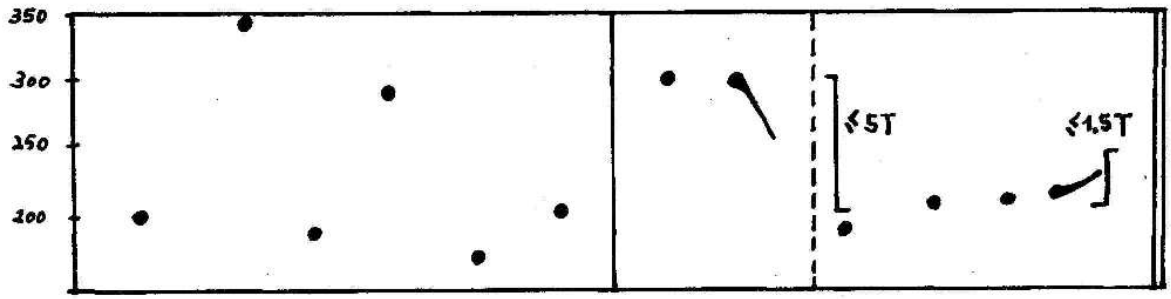
3. Final freq. -range (Hz): 242 (dang[1]) — 142 (ji[4]) = 100

4. Tonal behavior of final tone/particle: 250-142 (ji[4]) = 108 Hz ≤ 5.5 tones (slope)

5. Tonal behavior of final tone-unit: 250-142 (ji[4]) = 108 Hz ≤ 5.5 tones (slope)

Notes:
(1) The contribution of the first *xian*[1°/(4)] is unclear. It is very likely to be reduced, as speech tempo is quite fast, so that its final frequency cannot be used as a reference point for the calculation of declination. For this reason, the calculation began with the second *xian*[1°/(4)]. While there seems to be an *upshift* in pitch after the third *xian*[1°/(4)], this could also be a rewidening of tonal bandwidth as the initial frequency of *xian*[4°] (of *xian*[4°]*-zai*[4]) is almost identical to that of the first *xian*[1°/(4)] allowing for downdrift - and that of *dang*[1] (of *dang*[1]*-ran*[2]) harmonizes in the same way with *dang*[1]of *dang*[1]*-ji*[4] (*dang*[1]*-ran*[2] is more stressed than *dang*[1]*-ji*[4], which may explain the slightly higher frequency than would otherwise be expected due to downdrift). For this reason only one calculation of declination was made.
(2) The contribution of the first *xin*[1]*- xian*[1°/(4)] to tonal band-width is also a little unclear. Since – *xian*[1°/(4)] appears to be reduced in frequency-range and declination also seems relatively gentle, it was thought possible that the final frequency of the 2nd *xian*[1°/(4)] might be roughly applicable to that of the first *xian*[1°/(4)]. However, as this is not certain as also does not take account of the downdrift between the first and the 2nd *xian*[1°/(4),] this can only be treated as a rough approximation.

(13) yLong 4



Long[3]-	xia[1]	*you*[3]	ah[0]	*you*[3]	ah[0]	Xian[4°]-	zai[4]	hen[3]	*pian*[2°]-	*yi*[3°]	oh
214	349	192	281	172	205	290	300/251	195	210	211	213/225

1. Declination (Hz): 214 (long[3]) — 195 (hen[3]) = 19: 5 = 3.8

2. Mean tonal band-width (Hz):

214 (long[3]) — 349 (xia[1])	=	135
192 (you[3]) — 281 (ah[0])	≥	89
172 (you[3]) — 205 (ah[0])	=	33
300 (zai[4]) — 195 (hen[3])	=	105
195 (hen[3]) — 210 (pian[2°/1])	=	15

≥ 75.4

3. Final freq. -range (Hz): 195 (hen[3]) — 210 (pian[2°/1]) = 15

4. Tonal behavior of final tone/particle: 213-225 (oh) = 12 Hz = 3/5 tone (slope)

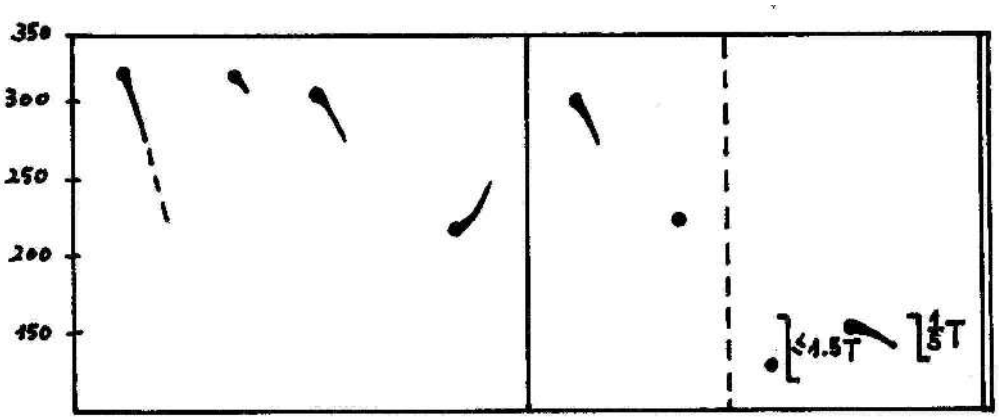
5. Tonal behavior of final tone-unit:

300 (zai[4]) — 195 (hen[3])	=	105 Hz	≤ 5 tones (fall)
195 (hen[3]) — 210 (pian[2°/1])	=	15 Hz	= 3/4 tone (rise)
213-225 (oh)	=	12 Hz	= 3/5 tone (rise)

3/4 tone (rise) & 3/5 tone (rise): together overall rise of ≤ 1.5 tones

Notes:
(1) There is an upshift after ah[0]. As zai[4] appears to be slightly reduced in length, it was concluded that its final frequency cannot serve in the calculation of declination. As the second part of the speech sample did not have enough reference points, it was excluded from the calculation of declination. The final result is therefore only an approximation.

(14) yLizhi 1



Na[4],	jian[4°]-	yi[4]	nin[2]	*li*[4]-	*zhi*[1°]	zem[3]ma[0]	yang[4]
322/232	320	292/(267)	217/253	299/262	232	139	167

1. Declination (Hz): 217 (nin[2]) — 139 (zem[3]) ≤ 78*: 3= 26.0

2. Mean tonal band-width (Hz):

320 (jian[4°]) — 217 (nin[2])	≥	103	
299 (li[4]) — 139 (zem[3])	=	160	= 97
139 (zem[3]) — 167 (yang[4])	=	28	

3. Final freq. -range (Hz): 139 (zem[3]) — 167 (yang[4]) = 28

4. Tonal behavior of final tone/particle:

139 (zem[3]) — 167 (yang[4])	= 28 Hz	≤ 1.5 tones	(rise)
167-163 (yang[4])	= 4 Hz	= 1/5 tone	(slope)

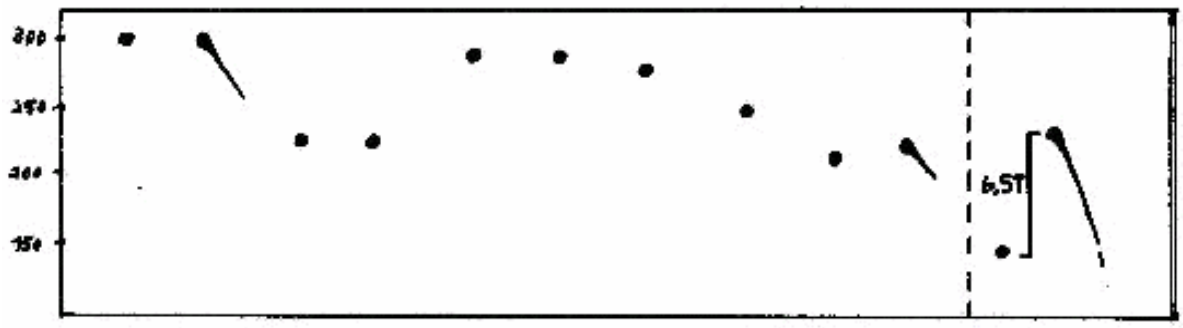
5. Tonal behavior of final tone-unit:

232 (zhi[1°]) — 139 (zem[3])	= 93 Hz	≥ 4.5 tones	(fall)
139 (zem[3]) — 167 (yang[4])	= 28 Hz	≤ 1.5 tones	(rise)
167-163 (yang[4])	= 4 Hz	= 1/5 tone	(slope)

Notes:
(1) The calculation of declination for this speech sample was found to be difficult. While there does not appear to be an upshift after the slight pause following *nin*[2], as - allowing for downdrift - the initial frequency of *li*[4] harmonizes very well with that of *jian*[4], the auditory impression is that a *downshift,* possibly pointing to a mistake, occurs on *zem*[3]. Therefore, the indicated result is likely to be an approximation.

(15) yLing 1

↴(?) ↴



Xian$^{4°}$	- zai^{4}	ling$^{2°}$	- meng$^{2°}$	yi^{1}	gong^{1}	- jin^{1}	shi^{4}	*shi*^{2}	- *er*^{4}	ma^{3}	- ke^{4}
300	300/239	226	230	286	286	271	242	208	219/184	150	276/148

1. Declination (Hz): --

2. Mean tonal band-width (Hz):

300 (xian^{4}) — 226 (ling^{2})	≥	74	
242 (shi^{4}) — 150 (ma^{3})	=	92	≥ 97.3
150 (ma^{3}) — 276 (ke^{4})	=	126	

3. Final freq. -range (Hz): 150 (ma) — 278 (ke) = 126

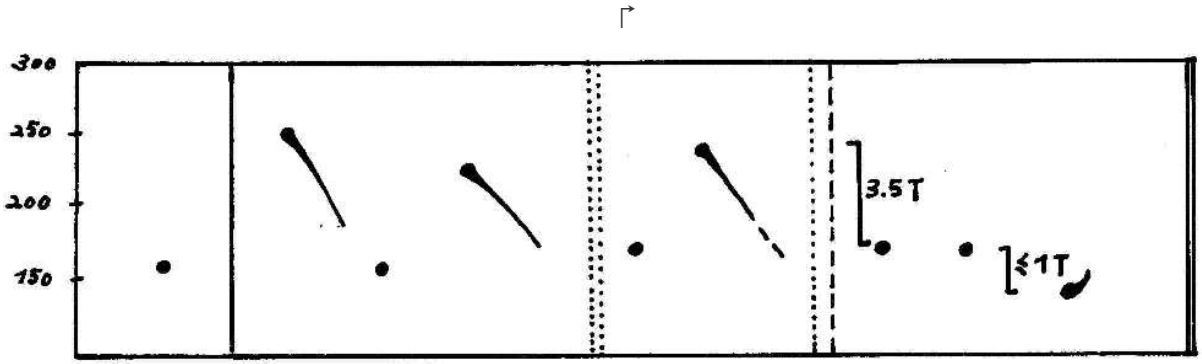
4. Tonal behavior of final tone/particle: 278-148 (ke^{4}) = 130 Hz = 6.5 tones (slope)

5. Tonal behavior of final tone-unit:

219 (er^{4}) — 150 (ma^{3})	=	69 Hz	≤ 3.5 tones (fall)
150 (ma^{3}) — 278 (ke^{4})	=	128 Hz	= 6.5 tones (rise)
278-148 (ke^{4})	=	130 Hz	= 6.5 tones (slope)

Notes:
(1) As there were no other reference points here, it was decided to use these two 2nd tones. This was thought to be possible as there does not seem to be an upshift on *yi*^{1} (allowing for downdrift, its pitch seems to harmonize well with that of *xian*^{4}). However, as both these 2nd tones are not in the first or the last tone-unit and it is also not clear whether downdrift affects all tones in equal manner, is possible that the obtained result is only an approximation.

(16) yMan 3



Hao^{3}.	Na^{4}	wo^{3}	yao^{4}	*wu*^{3}	*ge*^{4}	bai$^{2°}$	man$^{2°}$-	tou$^{2°}$
155	250/184	157	235/192	167	242/(184)	172	170	153

1. Declination (Hz): 167 (wu^{3}) — 153 (tou$^{2°}$) ≥ 14*: 2
≥ 7

2. Mean tonal band-width (Hz):

250 (na^{4}) — 157 (wo^{3})	=	93	
157 (wo^{3}) — 235 (yao^{4})	=	78	= 66.3
167 (wu^{3}) — 242 (ge^{4})	=	75	
172 (bai$^{2°/1}$) — 153 (tou$^{(4)}$)	=	19	

3. Final freq. -range (Hz): 172 (bai$^{2°/1}$) — 153 (tou$^{(4)}$) = 19

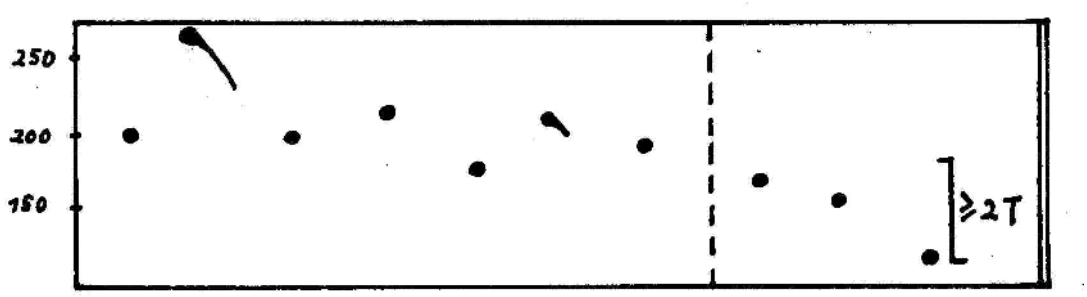
4. Tonal behavior of final tone/particle: 170 (man$^{2°/1}$) — 153 (tou$^{(4)}$) = 17 Hz ≤ 1 tone (fall)

5. Tonal behavior of final tone-unit:

242 (ge^{4}) — 172 (bai^{2})	=	70 Hz	= 3.5 tones (fall)
172 (bai$^{2°/1}$) — 153 (tou$^{2°/(4)}$)	=	19 Hz	≤ 1 tone (overall fall)
167 (wu^{3}) — 242 (ge^{4})	=	75 Hz	≤ 4 *Tones* (rise)

Notes:
(1) Calculations of declination were rendered difficult here by the fact that there is a pause followed by an upshift after *yao*^{4} and than a *downshift* on *bai*$^{2°/1}$(after strong lengthening of *ge*^{4}). As the auditory impression is that the end of this speech sample harmonizes with the beginning, reference points from the first and the last tone-units were taken. However, it is not certain that this was correct and the accuracy of the result is uncertain.

(17) yBing 4



Ni[3]	yao [4]	shem[2]-	ma[0]	*kou* [3]-	*wei* [4]	de[0]	bing[1]-	qi[2°]-	ling[2°]
200	276/243	196	213	168	208/197	11193	176	158	134

1. Declination (Hz): 200 (ni[3]) — 134 (ling[2°]) ≥ 66: 3 = 22.0

2. Mean tonal band-width (Hz):

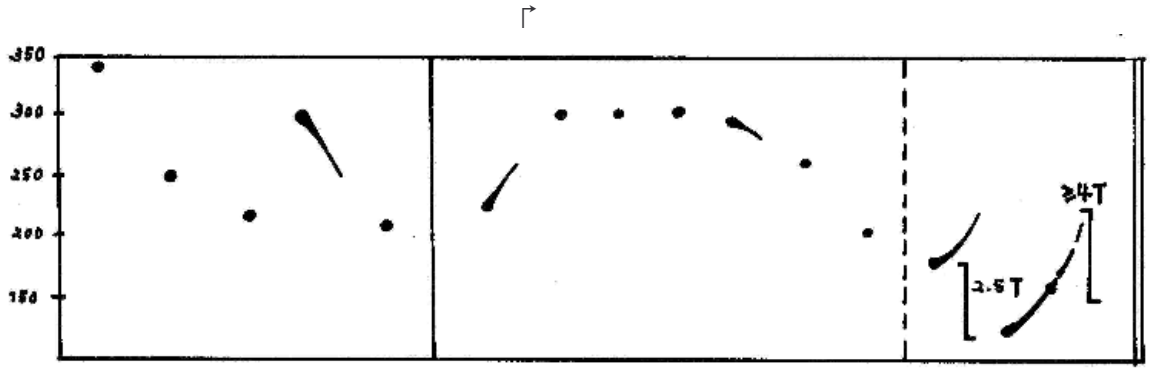
200 (ni[3]) — 300 (yao[4])	=	100	≥ 60.6
168 (kou[3]) — 208 (wei[4])	=	40	
176 (bing[1]) — 134 (ling[2°])	≥	42	

3. Final freq. -range (Hz): 176 (bing[1]) — 134 (ling[2°]) = 42

4. Tonal behavior of final tone/particle: 158 (qi[2°]) — 134 (ling[2°]) = 24 Hz ≥ 1 tone (fall)

5. Tonal behavior of final tone-unit: 176 (bing[1]) — 134 (ling[2°]) = 42 Hz ≥ 2 tones (overall fall)

(18) yMing 1



Zhong[1]-	yüan[2]-	jie[3]	*dao*[4]	le[0]	Ni[3]	xu[3]	bu[2]	xu[3]	yao[4]	yi[1]	dian[3]	*ming*[2]-	*zhi*[3]	ah
345	246	217	300/ 228	200	222	300			281/272	259	196	186/ 250	135	145/232

1. Declination (Hz): 222 (ni[3]) — 135 (zhi[3]) = 87: 4= 20.5

2. Mean tonal band-width (Hz):

345 (zhong[1]) — 217 (jie[3])	=	128	≥ 97.8
300 (dao[4]) — 200 (le[0])	=	100	
300 (xu[1]) — 188 (dian[3])	=	112	
186 (ming[2]) — 135 (zhi[3])	≥	51	

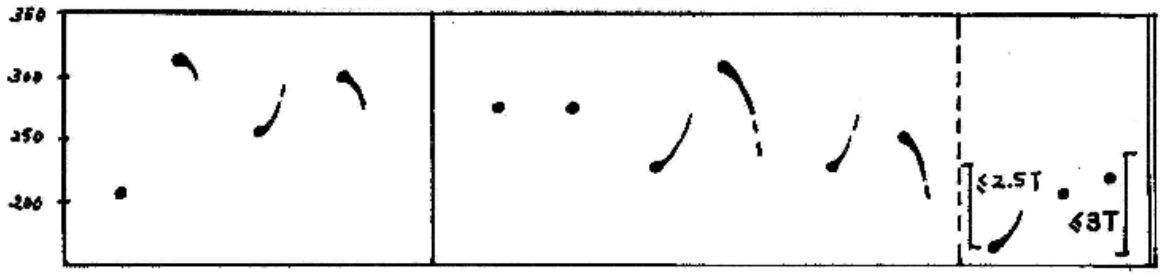
3. Final freq. -range (Hz): 186 (ming[2]) — 135 (zhi[3]) = 51

4. Tonal behavior of final tone/particle: 145-232 (ah) = 87 Hz ≥ 4 tones (rise)

5. Tonal behavior of final tone-unit:

186 (ming[2]) — 135 (zhi[3])	=	51 Hz	= 2.5 tones (fall)
145-232 (ah)	=	87 Hz	≥ 4 tones (rise)
135 (zhi[3]) — 232 (ah)	=	97 Hz	≤ 5 tones (overall rise)

(19) yMan 1



Nin^{2}	bu^{4}	chang^{2}	chang^{0}	Zhe^{4}-	bian^{1}	man^{2}-	tou$^{2°}$	*man*$^{3/2}$	*you*$^{3°}$	*ming*^{2}	de^{0}	ah^{0}
208	308	250/271	297/242	277	276	216/291	302/ 229	203/ 246	232/180	155/ 197	205	210

1. Declination (Hz): --

2. Mean tonal band-width (Hz):

208 (nin^{2}) — 308 (bu^{4}) ≥ 100
216 (man^{2}) — 302 (tou$^{2°}$) ≥ 86 ≥ 78
203 (man$^{3/2}$) — 155 (ming^{2}) ≥ 48

3. Final freq. -range (Hz): 155 (ming^{2}) — 205 (de^{0}) = 50

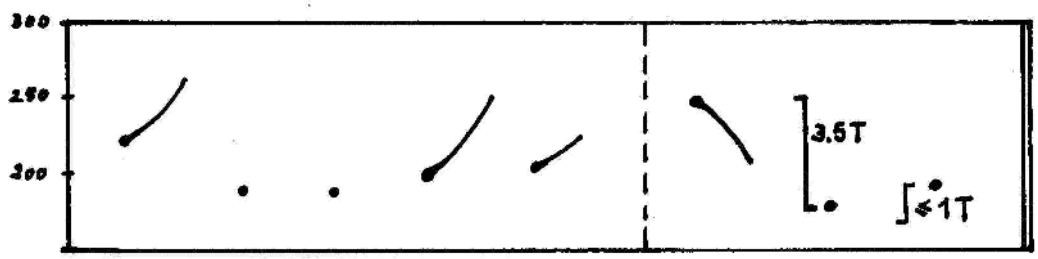
4. Tonal behavior of final tone/particle: 205-210 (ah) = 5 Hz = ¼ tone (rise)

5. Tonal behavior of final tone-unit:

203 (man^{2}) — 155 (ming^{2}) = 48 Hz ≤ 2.5 tones (fall)
155 (ming^{2}) — 205 (de^{0}) = 50 Hz = 2.5 tones (rise)
205-210 (ah^{0}) = 5 Hz = ¼ tone (rise)
2.5 tones (rise) & 1/4 tone (rise): together ≤ 3 tones (overall rise)

Chinese Table C: Results for intonation (Wu:)

(1) wNing 4



Mai[3]	liang[2°]-	ge[0]	*ning* [2]-	*meng* [2°]	pao[4]	cha[2°]	he[1]
222/266	186		199/260	205/220	254/213	182	200

1. Declination (slope-range) (Hz): 222 (mai[3]) — 182 (cha[2°]) ≥ 40: 4 = 10.0

2. Mean tonal band-width (Hz):

266 (mai[2°]) — 186 (liang[3°])	=	80
186 (liang[3]) — 266 (ning[2])	=	80
254 (pao[4]) — 182 (cha[2°])	=	72

= 77.3

3. Final freq. -range (Hz):

(pao[4]) — (cha[2°])	≥	72
182 (cha[2°]) — 200 (he[1])	≥	18

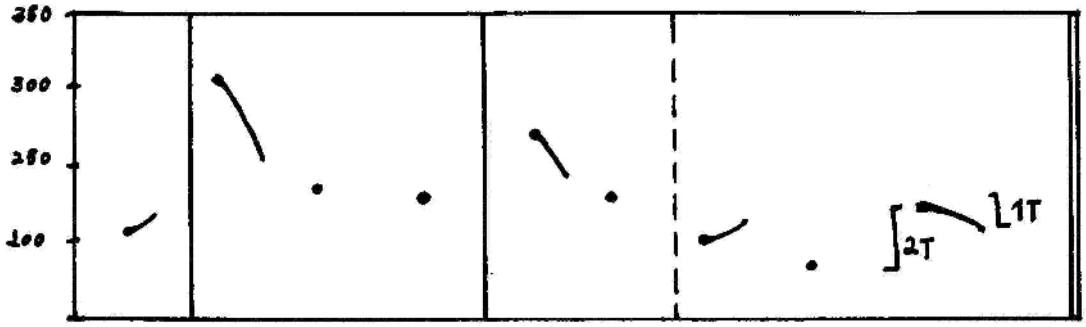
≥ 72/18

4. Tonal behavior of final tone/particle: 182 (cha[2°]) — 200 (he[1]) = 18 Hz ≤ 1 tone (rise)

5. Tonal behavior of final tone-unit:

254 (pao[4]) — 182 (cha[2°])	=	72 Hz	= 3.5 tones (fall)
182 (cha[2°]) — 200 (he[1])	=	18 Hz	≤ 1 tone (rise)

(2) wLizhi 4



Ah,	li^{4}-	zhi$^{1°}$,	dui^{4}	Li^{4}-	zhi^{1}	long$^{3/2}$-	yan^{3}	ah
205	302/250	235	235	276/253	235	216/228	180	221/200

1. Declination (slope-range) (Hz): --

2. Mean tonal band-width (Hz):

302 (li^{4}) — 235 (dui$^{4°}$) ≥ 67
276-253 (li^{4}) = 23 ≥ 46
228 (long$^{3/2}$) — 180 (yan^{3}) = 48

3. Final freq. -range (Hz): 216 (long$^{3/2}$) — 180 (yan^{3}) = 36

4. Tonal behavior of final tone/particle:

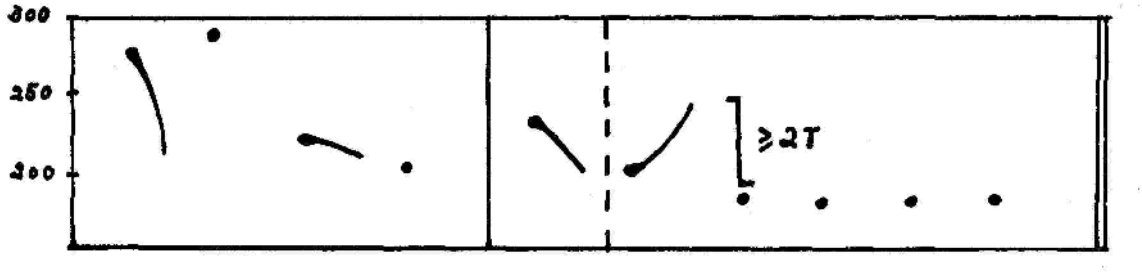
221/200 (ah) = 21 Hz = 1 tone (slope)
180 (yan^{3}) — 221 (ah) = 41 Hz = 2 tones (rise)

5. Tonal behavior of final tone-unit:

216 (long$^{3/2}$) — 180 (yan^{3}) = 36 Hz ≤ 2 tones (fall)
180 (yan) — 221 (ah) = 41 Hz = 2 tones (rise)
221/200 (ah) = 21 Hz = 1 tone (slope)

Notes:
(1) Finding a first reference point for declination in this speech sample was difficult. It was decided to use *zhi$^{1°}$* as its 1st tone is neutralized and could be assumed to be relatively near the *bottom line*. *Li^{4}* was not taken, as its pitch-slope is reduced (due to fast speech tempo).
(2) The 2nd *li^{4}- zhi^{1}* was problematic in the calculation of tonal band-width. As *zhi^{1}* is not neutralized here, it cannot be used to represent the *bottom line.* Therefore, the slope of *li^{4}* was taken as an approximation of the tonal band-width of this tone-unit.

(3) wLa 4



La[4]-	*jiao*[1]	shi[4°]	ba[0]	*Dui*[4]	wo[3/2]	xi[3°]-	huan[1°]	la[4°]-	jiao[1°]
272/216	280	229/215	205	242/205	215/242	186			185

1. Declination (slope-range) (Hz): 215 (wo[3]) — 185 (jiao[0]) ≥ 30*: 3= 10.0

2. Mean tonal band-width (Hz):

272-216 (la[4])	=	56
229 (shi[4°]) — 205 (ba[0])	=	24
242 (dui[4]) — 186 (xi[3])	=	56

= 45.3

3. Final freq. -range (Hz):

242 (wo[3]) — 186 (xi[3°])	=	56
(xi[3°]) — (jiao[1°])	=	ø

= 56/ø

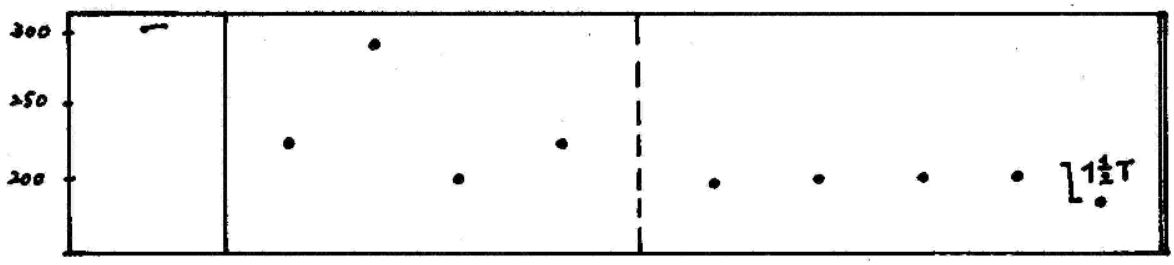
4. Tonal behavior of final tone/particle: 186 (xi[3°]) — 186 (jiao[1°]) = ø

5. Tonal behavior of final tone-unit:

205 (wo[3/2]) — 186 (xi[3°])	=	56 Hz ≥ 2 tones (fall)
(xi[3°]) — (jiao[1°])	=	ø

Notes:
(1) In the calculation of declination, the final frequency of *la*[4°] was taken as the first point of reference. However, as the relation between the frequency-range of a 4th tone and the bottom line is not clear, the obtained result is likely to be an approximation.
(2) In the calculation of mean tonal-band-width the slope of *la*[4] was preferred to the frequency of *jiao*[1] in the first
tone-unit, as *jiao*[1] is not neutralized and can therefore not be taken to represent the *bottom line* here.

(4) wBing 3



Ah	wo^{3}	*jiu*^{4}	xi^{3}-	huan^{1}	ning$^{2°}$-	meng$^{2°}$	bing$^{1°}$-	qi$^{2/1}$-	ling^{2}
302	219	290	200	216	200		200		169

1. Declination (slope-range) (Hz): 219 (wo^{3}) — 169 (ling$^{2°}$) ≥ 50: 4= 12.5

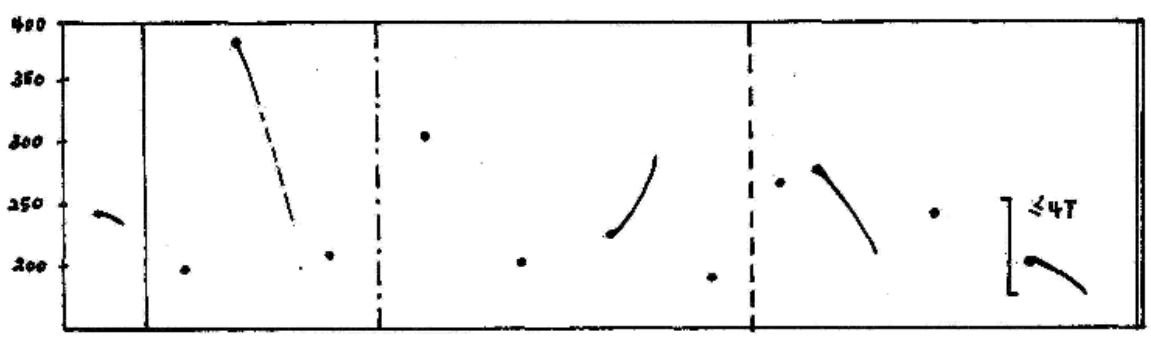
2. Mean tonal band-width (Hz):
219 (wo^{3}) — 290 (jiu^{4}) = 71
290 (jin^{4}) — 200 (xi^{3}) = 90 ≥ 64
200 (bing^{1}) — 169 (ling$^{2°}$) ≥ 31

3. Final freq.-range (Hz): 200 (ning$^{2°}$) — 200 (meng$^{2°}$) — 200 (bing$^{1°}$) — 200 (qi$^{2°}$) = ø
200 (qi$^{2°}$) — 169 (ling$^{2°}$) = 31 ø / 31

4. Tonal behavior of final tone/particle: 200 (qi$^{2°}$) — 169 (ling$^{2°}$) = 31 Hz = 1.5 tones (fall)

5. Tonal behavior of final tone-unit:
200 (ning$^{2°}$) — 200 (bing$^{1°}$) = ø
200 (qi$^{2°}$) — 169 (ling$^{2°}$) = 31 Hz = 1.5 tones (fall)
290 (jiu^{4}) — 200 (xi^{3}) = 90 Hz = 4.5 *Tones* (fall)

(5) wLizhi 3



Oh	ni^{3}	zher^{4}	you^{3}	hai$^{2°}$	you^{3}	*long*$^{3/2}$-	*yan*^{3}	he$^{2°}$	*li*^{4}-	*zhi*^{1}	ho
240	205	372/233	213	308	205	232/300	182	276	280/ 222	254	216/176

1. Declination (slope-range) (Hz): 205 (ni^{3}) — 176 (ho^{0}) ≥ 29*: 4= 7.25

2. Mean tonal band-width (Hz):

205 (ni^{3}) — 372 (zher^{4})	=	167	
308 (hai$^{2°/1}$) — 205 (you^{3})	=	103	≥ 94.5
232 (long$^{3/2}$) — 182 (yan^{3})	=	50	
280-222 (li^{4})	≥	58	

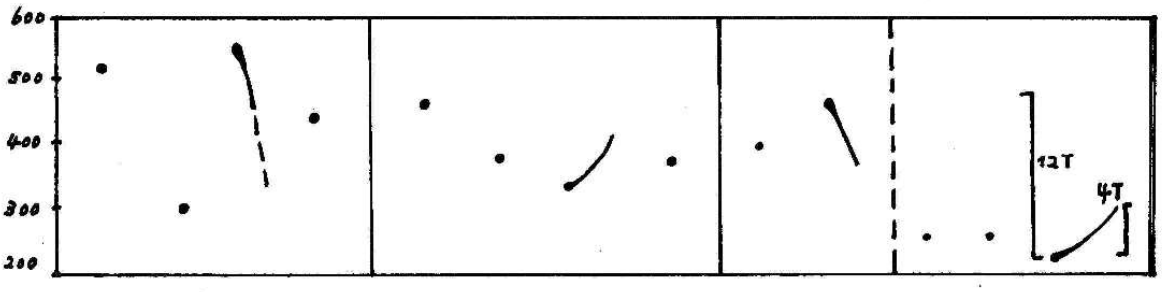
3. Final freq. -range (Hz): 280-222 (li^{4}) = 58

4. Tonal behavior of final tone/particle: 216-176(ho^{0}) = 40 Hz = 2 tones (slope)

5. Tonal behavior of final tone-unit: 254 (zhi$^{1°}$) — 216 (ho^{0}) = 38 Hz ≤ 2 tones (fall)
216-176 (ho^{0}) = 40 Hz = 2 tones (slope)
≤ 2 tones (fall) & 2 tones (fall): together ≤ 4 tones (overall fall)

Notes:
(1) In this speech sample, there is a short pause after the first *you*^{3}, followed by what appears to be an upshift on *hai*$^{2°/1}$. However, the frequency of *hai*$^{2°/1}$ and that of the 2nd *you*^{3} harmonize well with those of the preceding *zher*^{4} and the first *you*^{3} (the fact that *hai*$^{2°/1}$ is less stressed than *zher*^{4} may explain the rather large frequency difference between these two syllables). As the auditory impression is also that there is no upshift in this utterance and the last tone-unit seems to harmonize with the first, only one calculation of declination was made.

(6) wLizhi 2



You^{4}	mai^{3}	li^{4}-	zhi$^{1°}$	you^{4}	mai^{3}	long$^{3/2}$-	yan$^{3°}$	zhe$^{4°}$	*gan*^{4}	*shem*$^{2°}$ - *ma*°	yah
508	296	516/ 333	439	464	360	327/403	360	396	464/352	246	217/297

1. Declination (slope-range) (Hz): 296 (mai^{3}) — 217 (yah^{o}) = 79: 4 = 19.75

2. Mean tonal band-width (Hz):

508 (you^{4}) — 296 (mai^{3})	=	212
296 (mai^{3}) — 516 (li^{4})	=	220
464 (you^{4}) — 327 (long$^{3/2}$)	=	137
464 (gan^{4}) — 246 (shem$^{2°}$)	=	218

= 196.8

3. Final freq. -range (Hz):

464 (gan^{4}) — 246 (shem^{0})	=	218
246(shemma^{0})	=	ø

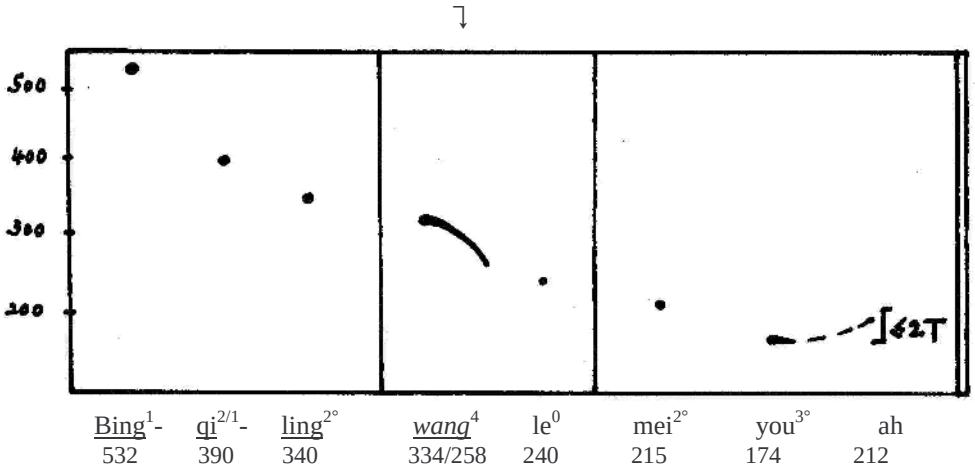
218/ ø Hz

4. Tonal behavior of final tone/particle: 217-297 (yah) = 80 Hz = 4 tones (rise)

5. Tonal behavior of final tone-unit:

464 (gan^{4}) — 246(shem$^{2°}$ma^{0}) = 218 Hz ≤ 11 tones (fall)
246(shem$^{2°}$ma^{0}) — 217 (yah) = 29 Hz ≤ 1.5 tones (fall)
217-297 (yah) = 80 Hz = 4 tones (rise)
11 tones (fall) & ≤ 1.5 tones (fall): together ≈ 12 tones (overall fall)

(7) wBing 2



Bing[1]-	qi[2/1]-	ling[2°]	*wang*[4]	le[0]	mei[2°]	you[3°]	ah
532	390	340	334/258	240	215	174	212

1. Declination (slope-range) (Hz): --

2. Mean tonal band-width (Hz): 532 (bing[1]) — 340 (ling[2°]) ≥ 192
334 (wang[4]) — 240 (le[0]) = 94 ≥ 143

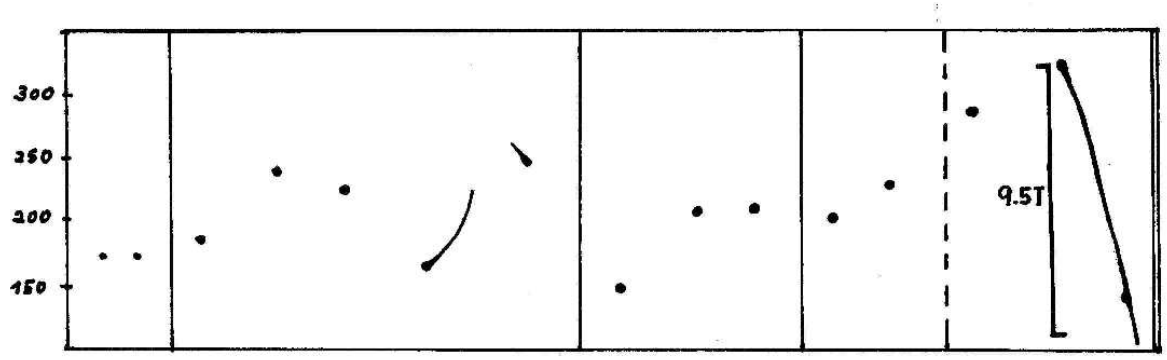
3. Final freq. -range (Hz): 215 (mei[2°]) — 174 (you[3°]) = 41

4. Tonal behavior of final tone/particle: 174-212 (ah) = 38 Hz ≤ 2 tones (rise)

5. Tonal behavior of final tone-unit: 334 (wang[4]) — 240 (le[0]) = 94 Hz ≥ 4.5 tones (fall)
240 (le[0]) — 215 (mei[2°]) = 25 Hz ≥ 1 tone (fall)
215 (mei[2°]) — 174 (you[3°]) = 41 Hz ≥ 2 tones (fall)
≥ 4.5 tones (fall) & ≥ 1 tone (fall) & ≥ 2 tones (fall): together = 7.5 tones (overall fall)
174-212 (ah) = 38 Hz ≤ 2 tones (rise)

Notes:
(1) As no other reference point was present for the *bottom line* in the first tone-group, *ling*[2°] was chosen for the calculation of declination. However, the exact relation of a neutralized 2nd tone and the *bottom line* is not clear and the obtained result is therefore likely to be only an approximation.

(8) wMan 2



Ei- yo	ni^{3}	xian^{4}-	cheng^{2}	man^{2}-	tou$^{2°}$	mai^{3}	hui$^{2/1}$	lai$^{2°}$	pa$^{4°}$	bu$^{2°}$	*gan*^{1}-	*jing*^{4}	ba
170	180	246/ 235	239	176/225	250	150	210	210	208	215	276	314/150	149/112

1. Declination (slope-range) (Hz): 180 (ni^{3}) — 112 (ba^{0}) = 68: 5 = 13.6

2. Mean tonal band-width (Hz):

180 (ni^{3}) — 246 (xian^{4})	=	66	≥ 91 (?)*
176 (man^{2}) — 250 (tou$^{(4)}$)	≥	74	
150 (mai^{3}) — 210 (hui$^{2°}$)	=	60	
314 (jing^{4}) — 150 (mai^{3})	=	164	

3. Final freq. -range (Hz):

150 (mai$^{3°}$) — 208 (pa^{4})	=	58	
314 (jing^{4}) — 150 (mai^{3})	=	164	= 58/164

4. Tonal behavior of final tone/particle: 150-112 (ba) = 38 Hz ≥ 2 *Tones* (slope)

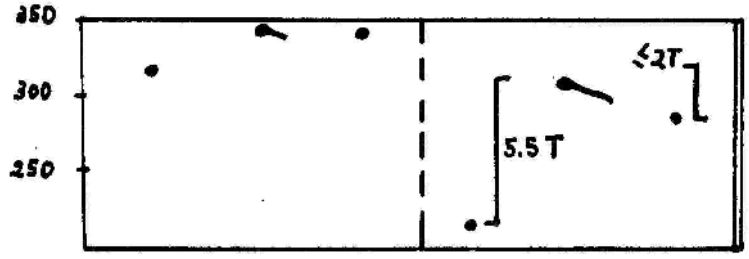
5. Tonal behavior of final tone-unit: 314 (jing^{4}) — 150 (ba^{0}) = 164 Hz ≤ 8.5 tones (fall)

150-128 (ba^{0}) = 22 Hz ≥ 1 tone (slope)

≤ 8.5 tones (fall) & ≥ 2 tones (slope): together ≥ 10 *Tones* (overall fall)

Notes:
(1) The calculation of tonal band-width was very difficult for this speech sample. It was not clear how to deal with the gradual widening of frequency-range in the last tone-group. As declination appears to be relatively gentle in this utterance, it was thought that *mai*^{3} might be used as representing the bottom line here. The auditory impression is that the final ba^{0} harmonizes very well with *mai*^{3} and that this line of action might be correct, though only yielding an approximate result.
(2) Based on *mai*^{3} as the (approximate) *bottom line* of the last 2 tone-group, the initial frequency of *ba*^{0} is assumed to be also around 150 Hz 149 Hz (Allowing for downdrift). This is, however, only a very gross approximation.

(9) wLa 3



Ni^{3}	la^{4}-	jiao^{1}	hen^{3}	*la*^{4}	ma
297	340	340	222	326	290

1. Declination (slope-range) (Hz): 297 (ni^{3}) — 222 (hen^{3}) = 75: 2 = 37.5

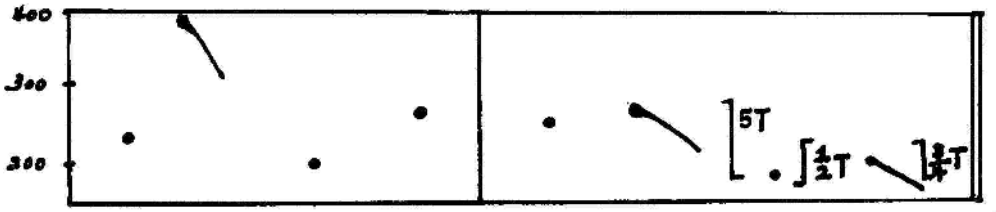
2. Mean tonal band-width (Hz): 320 (ni^{3}) — 340 (la^{4}) = 20
216 (hen^{3}) — 326 (la^{4}) = 110 = 65

3. Final freq. -range (Hz): 216 (hen^{3}) — 326 (la^{4}) = 110

4. Tonal behavior of final tone/particle: 326 (la^{4}) — 290 (ma^{0}) = 36 Hz ≤ 2 tones (fall)

5. Tonal behavior of final tone-unit: 216 (hen^{3}) — 326 (la^{4}) = 110 Hz = 5.5 tones (rise)
326 (la^{4}) — 290 (ma^{0}) = 36 Hz ≤ 2 tones (fall)

(10) wDan 4



E^{2}-	dan^{4}	zhu^{3}	tang^{1}	bu$^{2°}$	*tai*^{4}	*hao*^{3}	ba
230	390/302	202	276	268	270/226	167	176/160

1. Declination (slope-range) (Hz): 202 (zhu^{3}) — 167 (hao^{3}) ≥ 35: 3 = 11.6

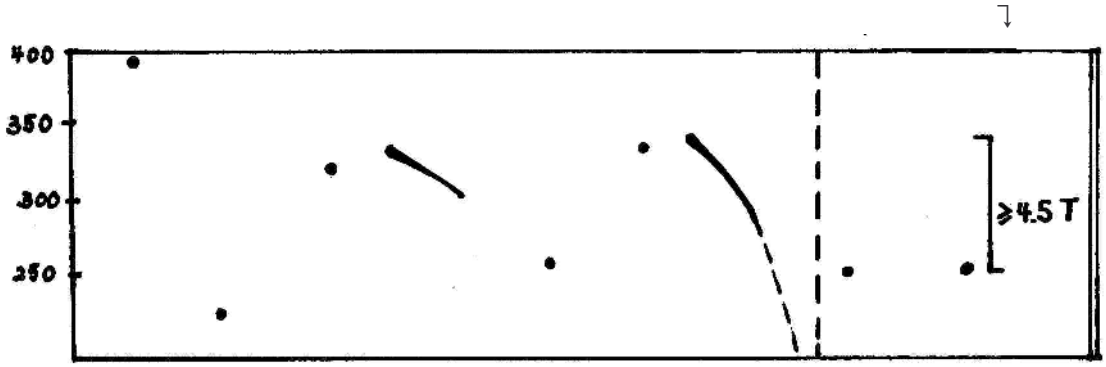
2. Mean tonal band-width (Hz): 390 (dan^{4}) — 202 (zhu^{3}) = 188
202 (zhu^{3}) — 276 (tang^{1}) = 74 = 121.6
270 (tai^{4}) — 167 (hao^{3}) = 103

3. Final freq. -range (Hz): 270 (tai^{4}) — 167 (hao^{3}) = 103

4. Tonal behavior of final tone/particle: 176-160 (ba) = 16 Hz ≥ 3/4 tone (slope)

5. Tonal behavior of final tone-unit: 270 (tai^{4}) — 167 (hao^{3}) = 103 Hz = 5 tones (fall)
167 (hao^{3}) — 176 (ba) = 9 Hz ≤ 1/2 tone (rise)
176-160 (ba) = 16 Hz = 3/4 tone (slope)

(11) wDan 12



Jie$^{4°}$-	yü^{3}	ji^{1}-	dan^{4}	he$^{2°}$	ya^{1}-	dan ^{4}	*zhong*^{1} -	*jian*^{1}
392	235	320	333/291	267	348	349/272	258	258

1. Declination (slope-range) (Hz): --

2. Mean tonal band-width (Hz):

392 (jie$^{4°}$)	—	235 (yu^{3})	=	157	
333 (dan^{4})	—	235 (yu^{3})	=	98	≥ 110.6
349		-272 (dan^{4})	≥	77	

3. Final freq. -range (Hz):

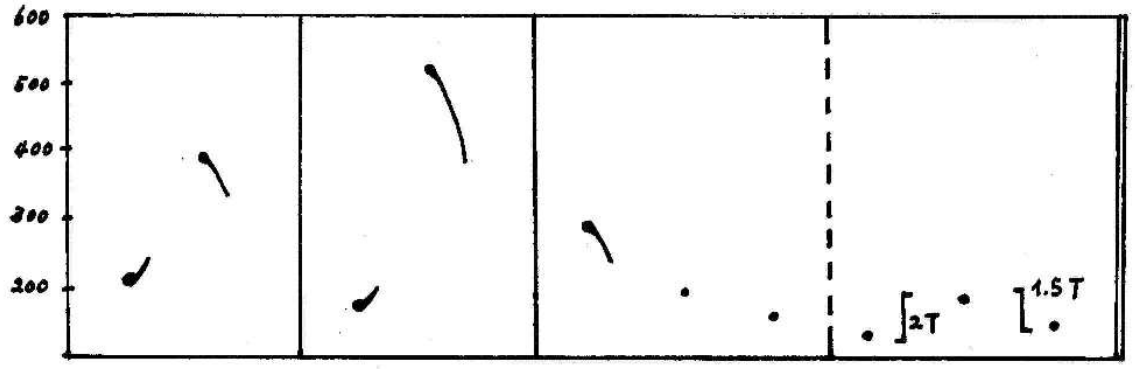
349		-272 (dan^{4})	≥	77	
258 (zhong^{1})	—	258 (jian^{1})	=	ø	77/ ø Hz

4. Tonal behavior of final tone/particle: 258 (zhong^{1}) — 258 (jian^{1}) = ø

5. Tonal behavior of final tone-unit: 349 (dan^{4}) — 258 (zhong^{1}) = 91 Hz 4.5 tones (fall)

Notes:
(1) The contribution of *zhong*^{1}*- jian*^{1} is unclear here. It is however to be assumed that as they carry 1st tones these syllables do not represent the *bottom line* but are closer to the *top line*. The indicated result is therefore only a very gross approximation. As a second problem in this speech sample, the contribution of *jie*$^{4°}$ and *yu*^{3} is not clear either. The auditory impression is that either one of these syllables is 'out of tune' with the rest of the utterance.

(12) wMan 4



Man^{2}-	tou$^{2°(4)}$	man^{2}-	tou$^{2°(4)}$	*zuo*^{4}	*hao*^{3}	de^{0}	man^{2}-	tou$^{2°}$	ma^{0}
203	390/347	170	508/365	297/239	198	182	162	208	174

1. Declination (slope-range) (Hz): --

2. Mean tonal band-width (Hz):

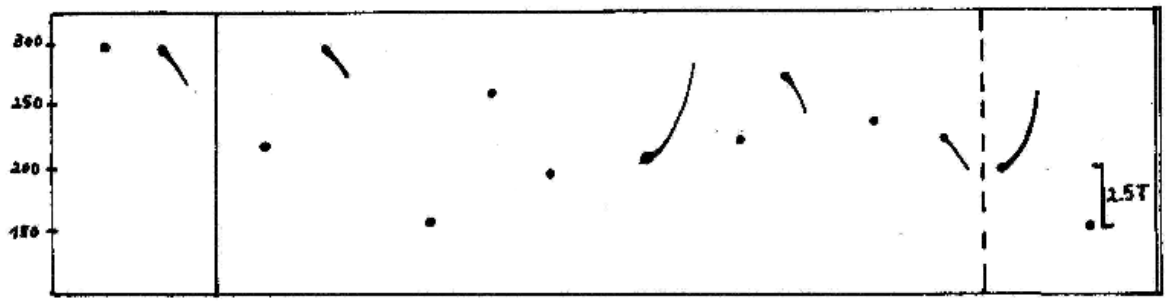
203 (man^{2}) — 390 (tou$^{2°/(4)}$) ≥ 187
170 (man^{2}) — 508 (tou$^{2°/(4)}$) ≥ 338
297 (zuo^{4}) — 198 (hao^{3}) = 99 ≥ 167.5*
162 (man^{2}) — 208 (tou$^{2°/(4)}$) ≥ 46

3. Final freq. -range (Hz): 162 (man^{2}) — 208 (tou$^{2°/(4)}$) = 41

4. Tonal behavior of final tone/particle: 208 (tou$^{2°/(4)}$) — 174 (ma^{0}) = 34 Hz ≥ 1.5 tones (fall)
174 (ma^{0}) = ø tones

5. Tonal behavior of final tone-unit: 162 (man^{2}) — 208 (tou$^{2°/(4)}$) = 46 Hz ≥ 2 tones (rise)
208 (tou$^{2°/(4)}$) — 174 (ma^{0}) = 34 Hz =1.5 tones (fall)

(13) wLizhi 1



Ling^{1}-	wai^{4}	wo^{3}	zai^{4}	mai^{3}	yi$^{1°}$-	dian$^{3°}$	ning^{2}-	meng^{2}	li^{4}-	zhi^{1}	he$^{2°}$	long$^{3/2}$-	yan^{3}
291	290/266	225	291/ 262	168	260	189	200/281	232	270/ 241	239	235/ 208	200/ 262	152

1. Declination (slope-range) (Hz): 225 (wo^{3}) — 152 (yan^{3}) = 73: 4 = 14.6

2. Mean tonal band-width (Hz):

290 (wai^{4}) — 168 (mai^{3})	=	122	= 106.9
291 (zai^{4}) — 168 (mai^{3})	=	123	
260 (yi$^{2°/1}$) — 189 (dian$^{3°}$)	=	71	
262 (long$^{3/2}$) — 152 (yan$^{3°}$)	=	110	

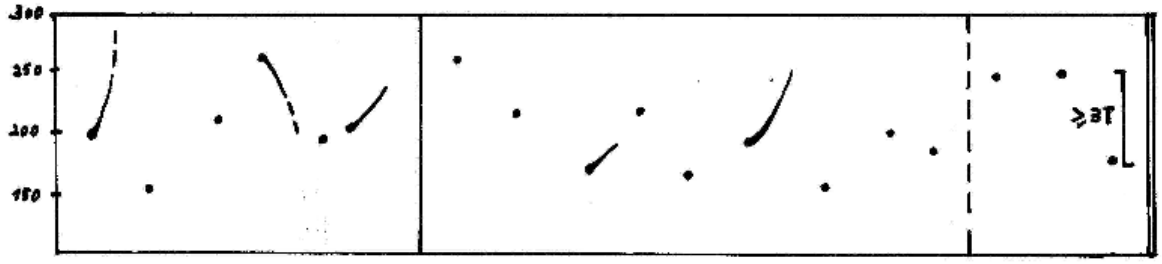
3. Final freq. -range (Hz): 200 (long$^{2/3}$) — 152 (yan^{3}) = 48

4. Tonal behavior of final tone/particle: 200 (long$^{3/2}$) — 152 (yan^{3}) = 48 ≤ 2.5 tones (fall)

5. Tonal behavior of final tone-unit: 200 (long$^{3/2}$) — 152 (yan^{3}) ≤ 48 Hz = 2.5 tones (fall)

Notes:
(1) As the initial pitch of *zai*^{4} is almost identical to that of *wai*^{4}, it is assumed that *mai*^{3} may be treated as representing the common *bottom line*. (Note that *zai*^{4} is more stressed than *wai*^{3} and that this may account for the fact that its pitch seems higher than would normally be expected due to downdrift).

(14) wBing 1



Wo$^{3/2}$	you^{3}	yi^{2}-	ge^{0}	nü^{3}-er^{2}		ta^{1}	xiang$^{3/2}$	mai^{3}	yi^{1}	dian$^{3°}$	tang^{2}-	guo^{3}	huo^{4}-zhe$^{3°}$	bing^{1}-	qi$^{2/1}$-	ling$^{2°}$
195/285	155	213	262/	184	191/	258	213	176	215	167	195/	155	213	190	250	188
			195		222						258					

1. Declination (slope-range) (Hz): 176 (mai^{3}) — 155 (guo^{3}) ≥ 21*: 2= 10.5

2. Mean tonal band-width (Hz):

155 (you^{3}) — 213 (yi$^{2°/1}$)	=	58	
258 (ta^{1}) — 176 (mai^{3})	=	82	= 76.2
258 (ta^{1})— 258 (tang^{2}) — 155 (guo^{3})	=	103	
250 (bing^{1}) — 188 (ling$^{2°}$)	=	62	

3. Final freq. -range (Hz): 250 (bing^{1}) — 188 (ling$^{2°}$) = 62

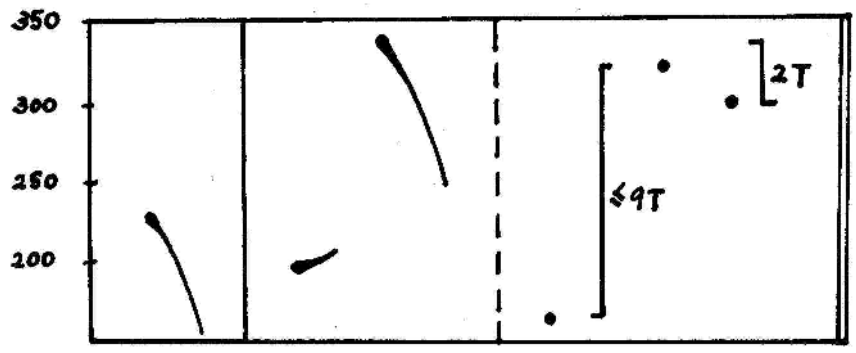
4. Tonal behavior of final tone/particle: 250 (bing^{1}) — 188 (ling$^{2°}$) = 62 Hz ≥ 3 tones (fall)

5. Tonal behavior of final tone-unit:

190 (zhe$^{3°}$) — 250 (bing^{1})	=	60 Hz	= 3 tones	(rise)
250 (bing^{1}) — 188 (ling$^{2°}$)	=	62 Hz	≥ 3tones	(fall)

Notes:
(1) While there is a pause after *er*^{2}, the pitch of *ta*^{1} harmonizes well with *wo*$^{3/2}$ and *yi*^{2}- *ge*^{0} and it was therefore concluded that there is no *upshift* here. The same applies to two other points in the speech sample, after er^{2} and after *dian*$^{3°}$, where there also appear to be very brief pauses. The auditory impression is that everything harmonizes well. This is, however, not the case with the point between *zhe*$^{3°}$ and *bing*^{1}, where the auditory impression is that of an *upshift* before *bing*^{1}. For this reason, this last tone-unit was excluded from the calculation of declination.

(15) wDan 11



Oh.	E^{2}-	dan^{4}	*hao*^{3}	*chi*^{1}	ma^{0}
239/150	195/203	350/251	155	334	300

1. Declination (slope-range) (Hz): --

2. Mean tonal band-width (Hz): 350 (dan^{4}) — 155 (hao^{3}) = 195
155 (hao^{3}) — 334 (chi^{1}) = 179 = 187

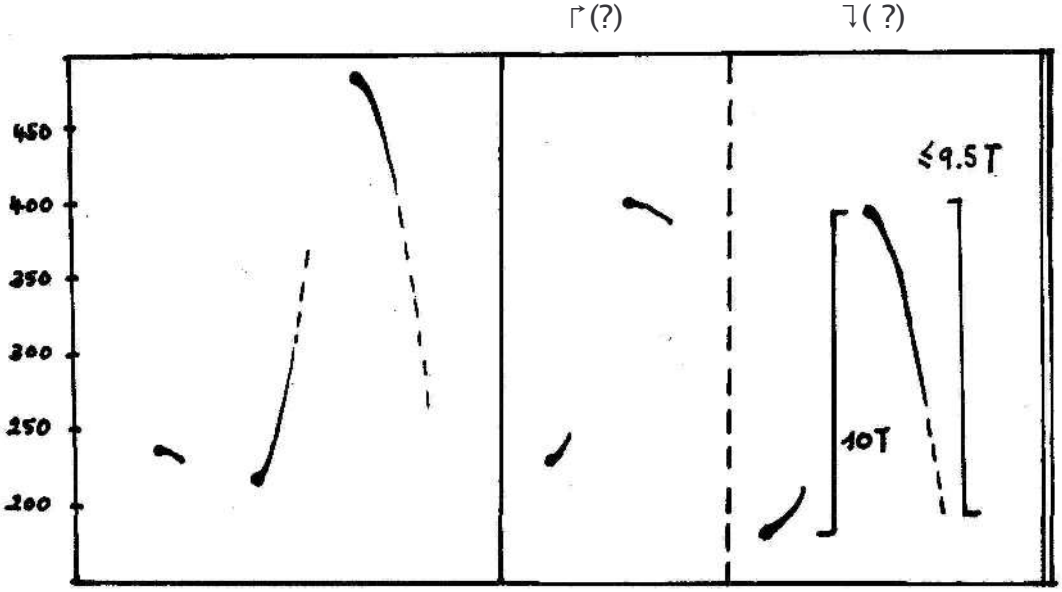
3. Final freq. -range (Hz): 155 (hao^{3}) — 334 (chi^{1}) = 179

4. Tonal behavior of final tone/particle: 334 (chi^{1}) — 300 (ma^{0}) = 34 Hz ≤ 2 tones (fall)

5. Tonal behavior of final tone-unit:
350 (dan^{4}) — 155 (hao^{3}) = 195 Hz ≤ 10 tones (fall)
155 (hao^{3}) — 334 (chi^{1}) = 179 Hz ≤ 9 tones (rise)
334 (chi^{1}) — 300 (ma^{0}) = 34 Hz = 2 tones (fall)

Notes:
(1) As no other reference points were available in the first tone unit, the initial frequency of e^{2} was taken to represent the bottom line here. However, as the relation of this pitch-point to the *bottom line* is unclear, the obtained result is an approximation.

(16) wMan 3



Er,	<u>man</u>^{2}-	<u>tou</u>$^{2°/(4)}$	ye^{3}	you$^{3°/(4)}$	*<u>man</u>*^{2}-	*<u>tou</u>*$^{2°/(4)}$
235	213/356	485/231	235	400/376	182	382/193

1. Declination (slope-range) (Hz): --

2. Mean tonal band-width (Hz):

213 (man^{2}) — 485 (tou$^{2°/(4)}$) = 272
235 (ye^{3}) — 400(you$^{3°/(4)}$) = 165 ≥ 212.3*
182 (man^{2}) — 382 (tou$^{2°/(4)}$) = 200

3. Final freq. -range (Hz): 182 (man^{2}) — 382 (tou$^{2°/(4)}$) = 200

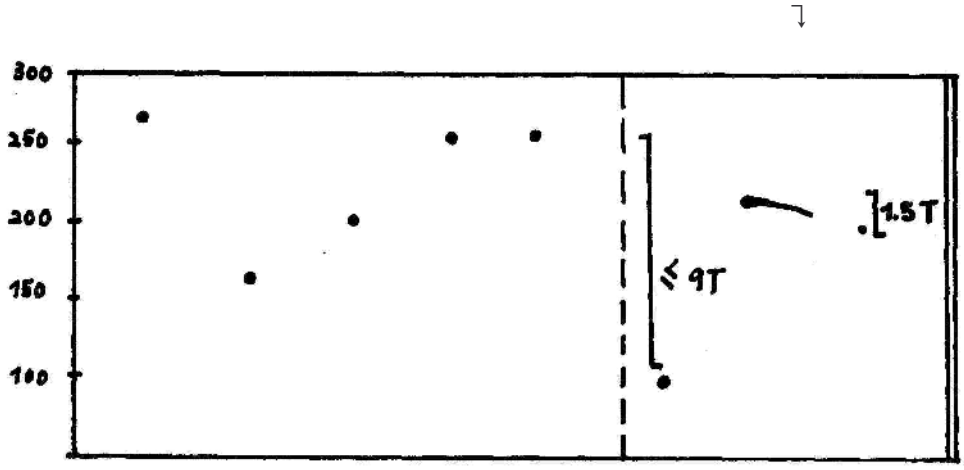
4. Tonal behavior of final tone/particle: 182 (man^{2}) — 382 (tou$^{2°/(4)}$) = 200 Hz = 10 tones (rise)

5. Tonal behavior of final tone-unit:

382 — 193 (tou$^{2°/(4)}$) = 189 Hz ≤ 9.5 tones (slope)
400(you$^{3°/(4)}$) — 182 (man^{2}) = 218 Hz ≥ 10 tones (fall)
182 (man^{2}) — 382 (tou$^{2°/(4)}$) = 200 Hz =10 tones (rise)
382 — 193 (tou$^{2°/(4)}$) = 189 Hz ≤ 9.5 tones (slope)

Notes:
(1) In this speech sample the reference points for the calculation of declination are both 2nd tones. As it is not clear if downdrift affects all tones in equal manner, the obtained results is regarded as an approximation.
(2) As two calculations of tonal band-width are based a 2nd tone (*man*^{2}), the obtained result is regarded here as a gross approximation.

(17) wLu 4



Wo$^{3/2}$	mai^{3}	yi$^{2°}$	gong^{1}-	jin^{1}	*lu*^{3}-	*rou*^{4}	ba^{0}
267	163	205	262	262	90	230/224	200

1. Declination (slope-range) (Hz): --

2. Mean tonal band-width (Hz):

267 (wo$^{3/2}$) — 163 (mai^{3})	=	104	
163 (mai^{3}) — 262 (gong^{1})	=	99	= 114.3
90 (lu^{3}) — 230 (rou^{4})	=	140	

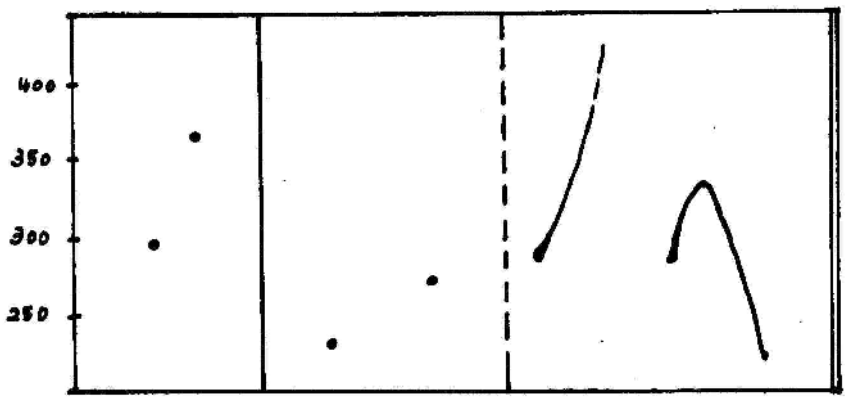
3. Final freq. -range (Hz): 90 (lu^{3}) — 230 (rou^{4}) = 140

4. Tonal behavior of final tone/particle: 230 (rou^{4}) — 200 (ba^{0}) = 30 Hz = 1.5 tones (fall)

5. Tonal behavior of final tone-unit:

263 (jin^{1}) — 90 (lu^{3})	= 173 Hz	≤ 9 tones	(fall)
90 (lu^{3}) — 230 (rou^{4})	= 140 Hz	= 7 tones	(rise)
230 (rou^{4}) — 200 (ba^{0})	= 30 Hz	= 1.5 tones	(fall)

(18) wNing 2



Ei- yo mai^{3} le^{0} *ning*^{2}- *meng*$^{2\wedge}$
290 364 239/271 276 281/438 281/336/228

1. Declination (slope-range) (Hz): --

2. Mean tonal band-width (Hz): 239 (mai^{3}) — 438 (ning^{2}) = 199

3. Final freq. -range (Hz): 438 (ning$^{2\wedge}$) — 228 (meng$^{2\wedge}$) =210

4. Tonal behavior of final tone/particle: (meng$^{2\wedge}$)

281 — 336 — 228 ? ≤ 3 tones & ≤ 5.5 tones (rise-fall)

55 Hz 108 Hz

5. Tonal behavior of final tone-unit: 281- 438 (ning^{2}) = 157 Hz ≤ 8 tones (slope)
281-336-228 (meng$^{2\wedge}$) ≤ 3 tones & ≤ 5.5 tones (rise-fall)

Notes:
(1) The auditory impression is that the last 2 tone units belong together. For this reason, *mai*^{3} was taken as representing the bottom line of both tone-units. As it is, however, not sure that this is accurate, the obtained result for declination is regarded as an approximation.

Table D: Results for supralaryngeal voice quality

Palatalization

1	**Source**	**cGans 1**	**comparative material**
	Examined segment 1	[ɔ] (| tɔl |)	[ɔ] (| zɔl |)
	Formants/energy maxima (Hz)	F_1 = 619; F_2 = 1181	F_1 = 508; F_2 = 1102
	Examined segment 2	[l]	[l]
	Formants/energy maxima (Hz)	F_1 = 405; F_2 = 1990	F_1 = (?); F_2 = 1705
	Result:	present	

2	**Source**	**cMoon 1**	**comparative material**
	Examined segment 1	[k] ([kin])	[k] ([kin])
	Formants/energy maxima (Hz)	Energy max.: 2800	Energy max.: 2461
	Examined segment 2	[i]	[i]
	Formants/energy maxima (Hz)	F_2 = 2670	F_2 = 2420
	Results:	present	

3	**Source**	**cGans 4**	**comparative material**
	Examined segment 1	[ɛ] ([nɛks])	[ɛ] ([nɛks])
	Formants/energy maxima (Hz)	F_2 = 2540	F_2 = 2250
	Examined segment 2	[k]	[k]
	Formants/energy maxima (Hz)	Energy max.: 1572	Energy max.: 1770
	Result:	not present	

4	**Source**	**cMango 2**	**comparative material**
	Examined segment 1	[k] ([kɔs])	[k] ([kɔs])
	Formants/energy maxima (Hz)	Energy max.: 1053	Energy max.: 1115
	Examined segment 2	[ɔ]	[ɔ]
	Formants/energy maxima (Hz)	F_2 = 1210	F_2 = 1050
	Result:	present	

5	**Source**	**yMing 3**	**comparative material**
	Examined segment 1	[ə] (| fen |)	[ə] (| pen |)
	Formants/energy maxima (Hz)	F_2 = 1560	F_2 = 1595
	Examined segment 2	-	-
	Formants/energy maxima (Hz)	-	-
	Result:	not present	

6	**Source**	**yLong 1**	**comparative material**
	Examined segment 1	[k] (| ke |)	[k] (| ke |)
	Formants/energy maxima (Hz)	Energy max.: 1825	Energy max.: 1620
	Examined segment 2	[ə]	[ə]
	Formants/energy maxima (Hz)	F_2 = 1535; F_1 = 450	F_2 = 1565; F_1 = 610
	Result:	not present	

7	**Source**	**yLing 1**	**comparative material**
	Examined segment 1	[k] (| ke |)	[k] (| ke |)
	Formants/energy maxima (Hz)	Energy max.: 1600	Energy max.: 1620
	Examined segment 2	[ə]	[ə]
	Formants/energy maxima (Hz)	F_2 = 1497; F_1 = (?)	F_2 = 1565; F_1 = 610
	Result:	not present	

8	**Source**	**wNing 4**	**wLizhi 1**
	Examined segment 1	[ə] (| he |)	[ə] (| he |)
	Formants/energy maxima (Hz)	F_2 = 1570	F_2 = 1385
	Examined segment 2	-	-
	Formants/energy maxima (Hz)	-	-
	Result:	present	

Labiodentalized voice

9	**Source**	**yLizhi 4**	**comparative material**
	Examined segment 1	[ɨ] (| shi |)	[ɨ] (| shi |)
	Formants/energy maxima (Hz)	(?)	(?)
	Examined segment 2	-	-
	Formants/energy maxima (Hz)	-	-
	Result:	(?)	
10	**Source**	**yBing 4**	**yLing 2**
	Examined segment 1	[i] (| lin |)	[i] (| lin |)
	Formants/energy maxima (Hz)	(?)	(?)
	Examined segment 2	-	-
	Formants/energy maxima (Hz)	-	-
	Result:	(?)	-

Notes:

(1) To: 2, 3, 4, 6 and 7: Though the question was whether the [k] in the affected syllables is really a [k] or forwarded, i.e. approaching [c], it was chosen to represent this segment as [k] in all cases.
(2) To: 5, 6, 7 and 8: Delayed setting-in of final *glottalization* was found here.
(3) To: 9 and 10: The presence of *labiodentalization* could not be clarified, since the affected syllables contained the front/mid close vowels [ɨ] and [i]