

Thoughts on intonation in the documentation,  
teaching, and revitalization of Saami

Patrik Bye

University of Tromsø/CASTL

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# 1 Background

(1) *Acquisition of intonation*

Newborn children cry with different melodies that reflect the ambient language (Mampe, Friederici, Christophe, and Wermke 2009). (French babies 3-5 days old tend to have rising melodies; German babies tend to have falling melodies.) The foetus receives a great deal of information about stress and pitch, and some (muffled) vowel quality in the last trimester of life in the womb.

(2) *Linguistic intonation*

A great deal of work in generative phonology on intonation as a system of discrete units (High and Low tones). Some especially influential work: Leben (1973), Pierrehumbert (1980), Gussenhoven (1984, 2004), Pierrehumbert and Beckman (1988), Ladd (2008).

(3) *Intonation in folk awareness of difference*

- a. Intonation and prosody are highly salient indicators of linguistic identity, figuring prominently in ‘folk awareness’ of dialect differences.
- b. Perceptual dialectology is belatedly catching on to intonation as a dialect indicator (e.g. Gooskens 2005), but is hampered by a relative dearth of descriptions.

(4) *Sociolinguistics of Intonation*

- a. A fair amount of research on how pitch range, register and voice quality correlate with sociological variables (esp. gender and geography).
- b. Surprisingly little done on variation in frequency of discrete patterns. Two exceptions:
  - (i) High Rise Terminals (HRT) in Australian English (Guy et al. 1986); HRT twice as likely in female speakers as males; 10 times as likely in teenagers than over 20s; 3 times as likely in working class than middle class speakers.
  - (ii) Intonation plays an important part of the negotiation of linguistic identity amongst Jewish and non-Jewish Israelis (Lefkowitz 2004).

(5) Although there’s been a lot of progress in understanding intonation in major languages like English and German, application of the results to less well studied languages still lags behind. Most descriptive grammars of such languages, even very recent ones published in prestigious series, such as the Mouton Grammar Library (MGL) very rarely even attempt intonation.

Language	Author	Year	MGL#	Pages intonation
Dolakha Newar	Carol Genetti	2007	40	20!
Gaagudju	Mark Harvey	2002	24	3
Hup	Patience Epps	2008	43	1
Jamul Tiipay	Amy Miller	2001	27	0
Kambera	Marian Klamer	1998	18	3
Kayardild	Nicholas Evans	1995	15	0
Kwaza	Hein van der Voort	2004	29	1
Lavukaleve	Angela Terrill	2003	30	1
Lezgian	Martin Haspelmath	1993	9	1
Mapuche	Ineke Smeets	2005	41	0
Qiang	Randy LaPolla, Chenglong Huang	2003	31	0
Toqabaqita	František Lichtenberk	2008	42	0
Wardaman	Francisca Merlan	1994	11	0

Table 1: Treatment of intonation in grammars of non-tonal languages in MGL

(6) *Possible reasons for neglect of intonation*

- a. Intonation involves phenomena with long domains that makes it difficult to observe, transcribe and analyze (t'Hart et al. 1990: 1–2).
- b. Intonation is still not a central part of most courses on phonology (generally an advanced topic on graduate courses in the US and Europe), and intonational phonologists and 'general' phonologists tend not to overlap much in their professional interests.
- c. Intonation is interdisciplinary, drawing on knowledge of phonology, syntax and pragmatics.
- d. Fieldwork on intonation depends on the possibility of making high-quality recordings.
- e. Sociological barriers slow down the diffusion of research paradigms and the adoption of novel analytical tools.
- f. Even today, intonational phonologists still (feel they) have to defend the notion that intonation is actually phonology, and part of language, not just animal communication (Gussenhoven 2004; Ladd 2008).

## 2 The origins of linguistic intonation

- (7) *'A half-tamed savage'*  
Linguistic intonation represents the grammaticalization of paralinguistic codes whose origin lies in correlations between pitch and physiological state.
- (8) *Pitch as physiological index*  
Pitch register, pitch range, and voice quality vary involuntarily as a function of
- a. size of larynx, thickness and weight of vocal folds.
  - b. emotional state (sadness, boredom, elation, anger, surprise).
- (9) *Pitch as paralinguistic code*  
Humans may bring the same variation under cognitive control to signal two kinds of meaning:
- a. *Affective*  
attributes of speaker; what is my attitude to you, and what you are saying (am I being friendly? helpful? surprised?)
  - b. *Informational*  
attributes of message; what is my attitude to what I am saying (am I confident or doubtful about the propositional content? what do I want you to attend to as important?)
- (10) *Three biological codes* (Gussenhoven 2004)  
Signalling these meanings exploits correlations between physiological state and the acoustic signal. Human beings use their tacit knowledge of these correlations in 3 ways.
- a. *Frequency Code* (Ohala 1984, 1994)  
High frequency is an index of a small organism; low frequency of a large organism. (Alternatively, high frequency as an index of tension/activation of fight or flight mechanisms/insecurity; low frequency as an index of lack of tension/security. See Zahavi and Zahavi 1997)
  - b. *Effort Code*  
Size of pitch excursion correlates positively with degree of effort.
  - c. *Production Code*  
Speech events begin with high pitch and end on a low pitch.
- (11) *Between physiology, paralinguistics and phonology*  
Since pitch is at least in part a physiological index, arguing for a distinct properly linguistic component to intonation can be

hard. If we want to demonstrate its kinship to phonology more generally, we have to show that intonational representations are in principle (i) arbitrary, (ii) discrete, (iii) dual patterned.

Physiology	Bio code	Universal interpretation	Linguistic interpretation
Size	Frequency Code small/big⇒high/low	Affective: small/big vulnerable/protective friendly/not friendly Informational: uncertain/certain	Question vs. Statement
Energy (phasing)	Production (Phase) Code beginning/end⇒high/low	Informational: @beginning: topic/continued topic @end: continuation/finality	Continuation rise vs. final low
Energy (level)	Effort Code less/more effort⇒narrow/wide span	Affective: less/more surprised less/more helpful Informational: less/more urgent	polar onset  focus

Table 2: Three biological codes, their physiological sources and interpretations, and examples of grammaticalization (adapted from Gussenhoven 2004: 95)

### 3 Arguments for linguistic intonation

(12) *Universality*

Certain aspects of intonation may indicate physiological states. Human beings may imitate the effects of these states, the imitations become conventionalized as paralinguistic codes, which are iconic (non-arbitrary) signs.

(13) *Arbitrariness*

Once patterns become discrete, however, they may retain their iconic meaning, or they may lose it as a result of regular diachronic processes, e.g. declarative rises in Belfast English, Central Scandinavian.

(14) *Discreteness*

Continuous variation in certain phonetic parameters correlate with continuous variation in some semantic parameter, e.g. continuously varying peak height signals degree of noteworthiness. At other times, changes to some phonetic parameter may result in discrete changes in interpretation (question vs. statement, given vs. new).

(15) *Duality of patterning*

Morphemes are the smallest meaningful units in language. Morphemes are made up of sound units/segments, which are not in themselves meaningful. There are proposals that each individual tone makes an independent contribution to meaning (Pierrehumbert and Hirschberg 1990). But there is at least one complex tune with an unanalyzable meaning, the ‘vocative chant’, e.g. *John-ny!*

(16) *A fourth argument: rule-governed phonological distribution*

An argument not discussed in Gussenhoven (2004). The distribution of intonational patterns can sometimes be shown to be governed by independently motivated structure of phonology.

## 4 South Saami and North Norwegian: a comparison

- (17) The intonation of South Saami (and other varieties of Saami) and that of the ambient North Germanic languages (Norwegian and Swedish) are palpably different — including northern varieties of Norwegian and Swedish. This is somewhat surprising, given the long (pre)history of contact between the two groups.
- (18) However, as more speakers acquire Saami after childhood, we can expect more North Germanic intonational features to diffuse into the network of Saami speakers.
- (19) There is very little work on Saami intonation to date, although Bergsland (1948: 247–255) has some treatment for the Røros dialect of South Saami.
- (20) Data from the audio recordings accompanying the *Saemesth amma!* course (Vangberg and Brandsfjell 2003). Sound files annotated using the speech analysis software PRAAT (Boersma and Weenink 2009).
- (21) Aim here: compare South Saami and North Norwegian
  - a. striking structural differences
  - b. differences in the way major functions are expressed (most useful in language learning)
  - c. some phonological rules of South Saami intonation

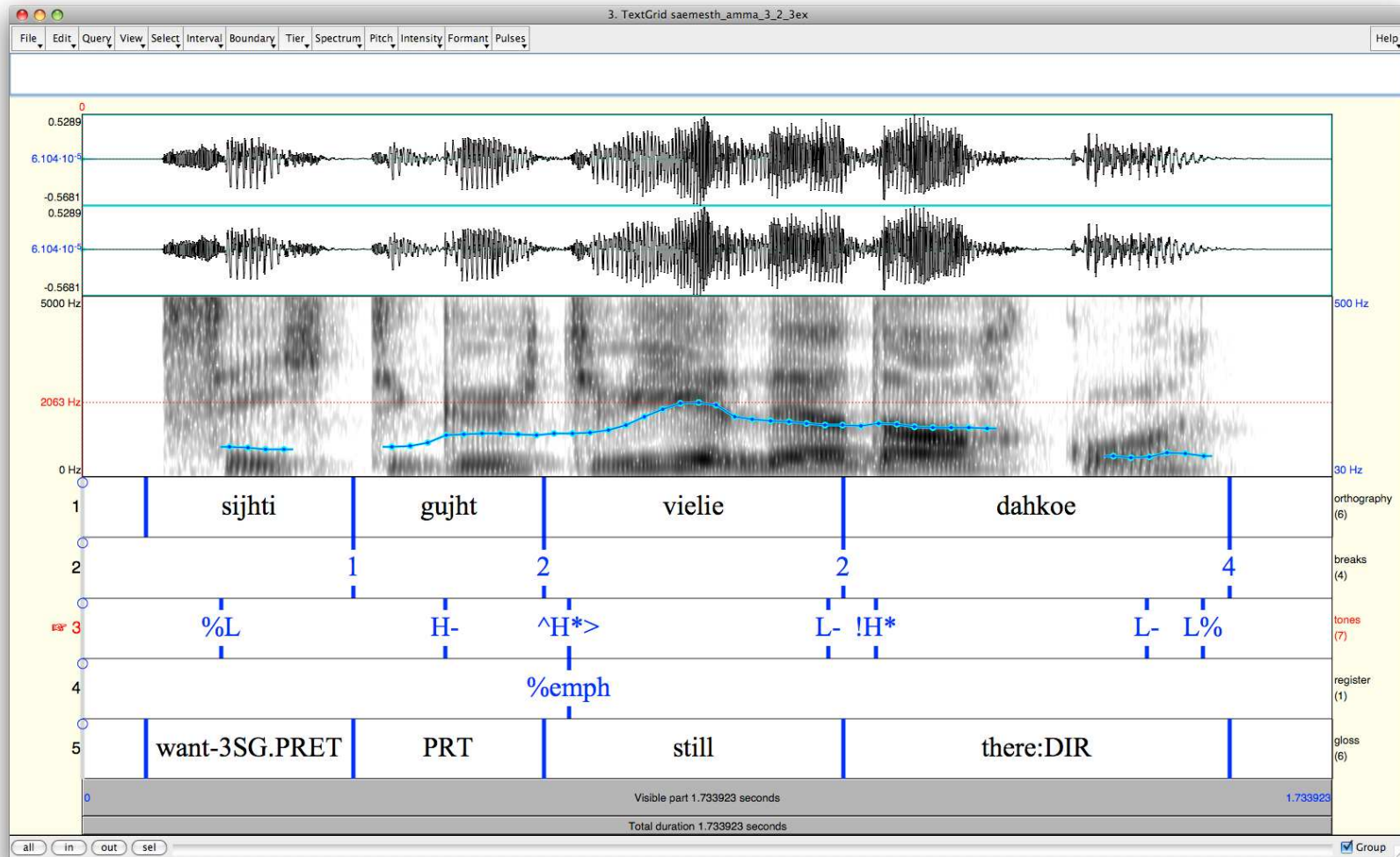
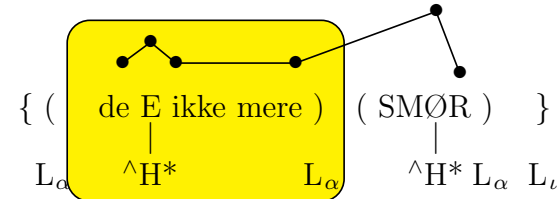
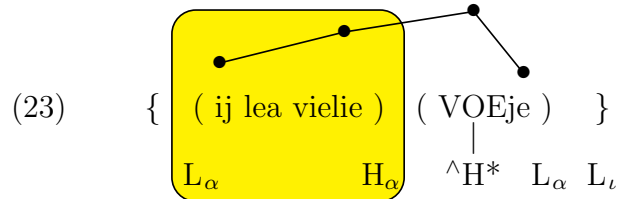


Figure 1: PRAAT window showing wave form and annotations

### 4.1 The initial rise

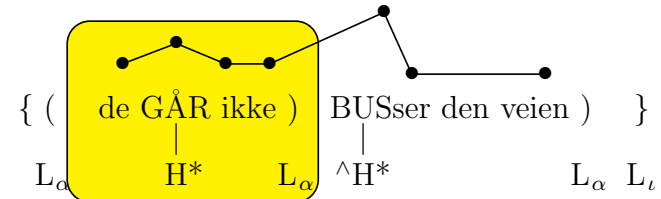
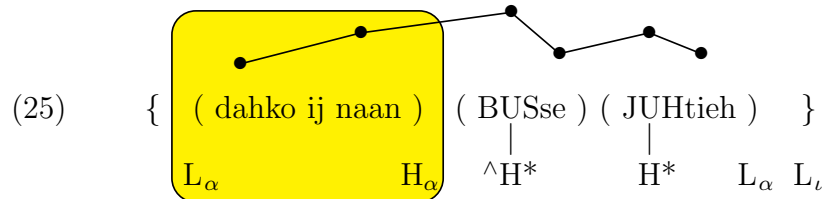
(22) ij lea vielie voeje  
 NEG.3SG.PRES be:CONNeg still butter  
 ‘There is no more butter.’

SA1;5



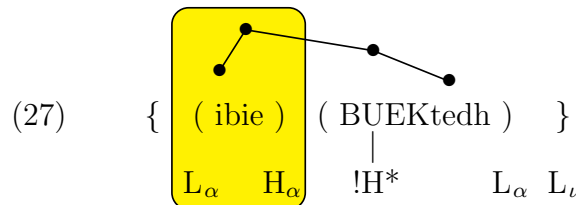
(24) dahko ij naan busse juhtieh  
 that-way NEG.3SG.PRES any bus travel:CONNeg  
 ‘No buses go that way.’

SA1;11



(26) ibie buektedh  
 NEG-1SG.PL manage-CONNeg  
 ‘We’re not managing.’

SA2;2



### 4.2 Phrasing

(28) dellie manne datnem maahtam leeredh  
 then 1SG.NOM 2SG.ACC be-able-1SG.PRES teach-INF  
 ‘Then I can teach you.’

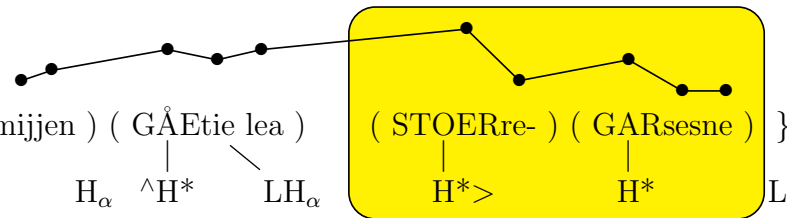
SA1;7



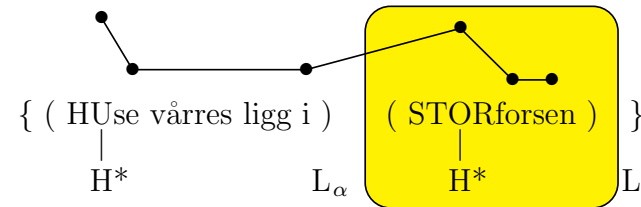
(29) { ( dellie manne ) ( DATnem ) ( MAAHtam ) ( LEEredh ) }  
 $L_\alpha$   $H_\alpha$   $\wedge H^*$   $L_\alpha$   $H^*$   $L_\alpha$   $H^*$   $L_\alpha$   $L_t$

(30) mijjen gætie lea Stoerregarsesne  
 1PL.GEN house be:3SG.PRES Storfors-LOC.SG  
 ‘Our house is in Storfors.’

SA2;12



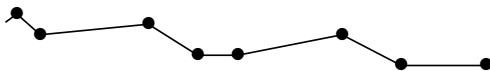
(31) { ( mijjen ) ( GÅEtie lea ) ( STOERre- ) ( GARSesne ) }  
 $H_\alpha$   $\wedge H^*$   $LH_\alpha$   $H^*>$   $H^*$   $L_t$



{ ( HUse vårres ligg i ) ( STORforsen ) }  
 $H^*$   $L_\alpha$   $H^*$   $L_t$

(32) bijle- vuejeme- lohkehtæjja  
 car- drive-GER- teacher  
 ‘Driving instructor.’

SA1;7



(33) { ( ( BIJle- ) ( VUEjeme- ) ( LOHkehtæjja ) }  
 $L_\alpha$   $H^*>L_\alpha$   $H^*$   $L_\alpha$   $H^*$   $L_\alpha$   $L_t$

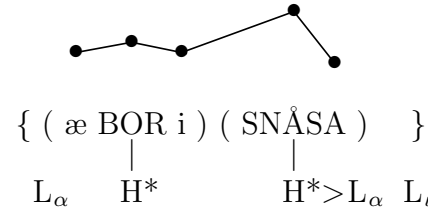
## 4.3 Declaratives

- (34) manne Snåasesne årroeminie  
 1SG.NOM Snåasa-LOC.SG live-GER  
 'I live in Snåasa.'

SA1;6

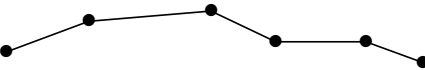


- (35) { ( manne ) ( SNÅAsesne ) ( ÅRroeminie ) }  
 L<sub>α</sub> H<sub>α</sub> H\* > H\* L<sub>α</sub> L<sub>ι</sub>

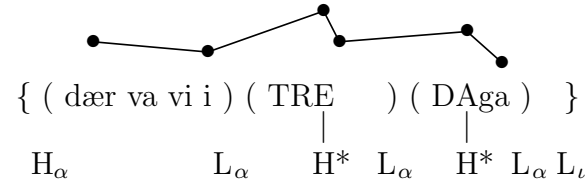


- (36) desnie lim golme biejjie  
 there be-1PL.PRET three day  
 'We were there for three days.'

SA2;10

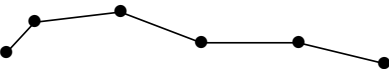


- (37) { ( desnie lim ) ( GOLme ) ( BIEJjie ) }  
 L<sub>α</sub> H<sub>α</sub> ^H\* L<sub>α</sub> H\* L<sub>α</sub> L<sub>ι</sub>

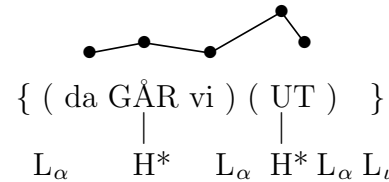


- (38) dellie olkese vaedtsien  
 then out-DIR walk-2DU.PRES  
 'Then we two are going out.'

SA2;1

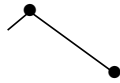


- (39) { ( dellie ) ( OLkese ) ( VAEDtsien ) }  
 L<sub>α</sub> H<sub>α</sub> ^H\* L<sub>α</sub> H\* L<sub>α</sub> L<sub>ι</sub>

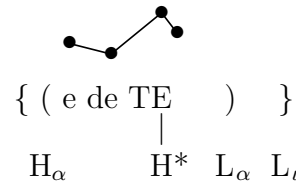


## 4.4 Yes-no questions

- (40) løøvje lea?  
 tea be:3SG.PRES  
 'Is there any tea?'



- (41) { ( LØØVje lea? ) }  
 H\* > Lα Lι

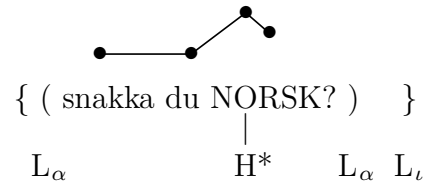


- { ( e de TE ) }  
 Hα H\* Lα Lι

- (42) datne nøørjen- gielem maahtah?  
 2SG.NOM Norway-GEN.SG language-ACC.SG be-able-2SG.PRES  
 'Do you speak Norwegian?'



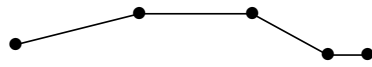
- (43) { ( datne ) ( NØØRjen- ) ( GIElem ) ( MAAHtam? ) }  
 Lα Hα H\* > Lα H\* Lα H\* Lα Lι



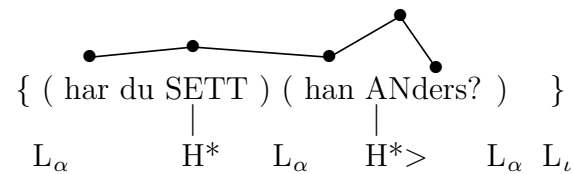
- { ( snakka du NORSK? ) }  
 Lα H\* Lα Lι

SA2;12

- (44) Aantam lea vuajneme?  
 Aanta-ACC.SG be:2.SG see-PERF.PART  
 'Have you seen Aanta?'



- (45) { ( Aantam lea ) ( VUAJneme? ) }  
 Lα Hα H\* Lα Lι



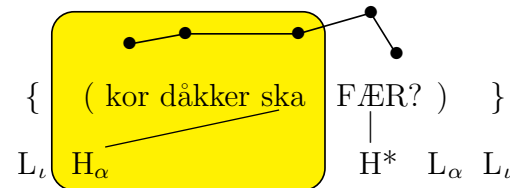
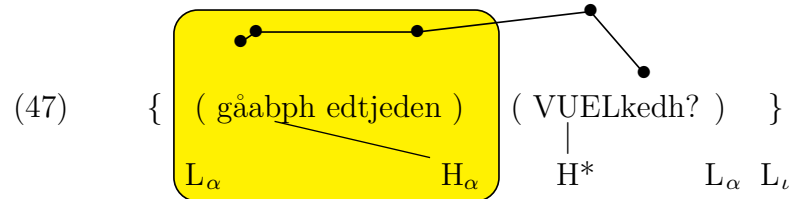
- { ( har du SETT ) ( han ANDers? ) }  
 Lα H\* Lα H\* > Lα Lι

SA3;4

### 4.5 WH-questions

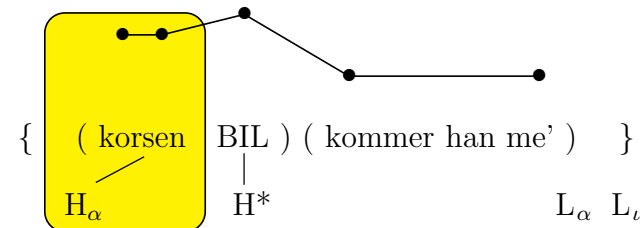
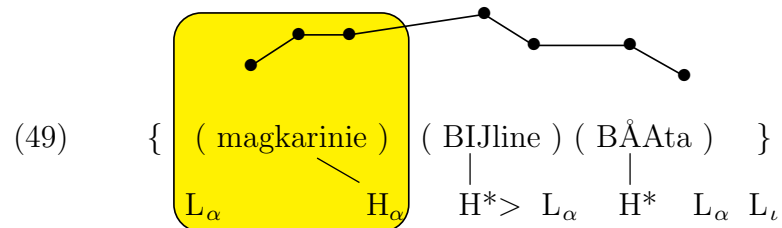
(46) gåabph edtjeden vuelkedh?  
 where shall-2DU.PRES set-off-INF  
 'Where are you two going to?'

SA1;10



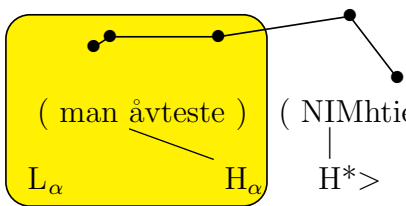
(48) magkarinie bijline båata?  
 what-kind car-COM.SG come-3SG.PRES  
 'What kind of car is he coming in?'

SA2;5

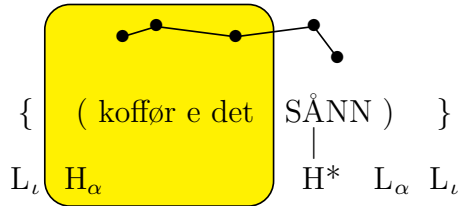


(50) man åvteste nimhtie?  
 what for so?  
 ‘Why so?’

SA2;4



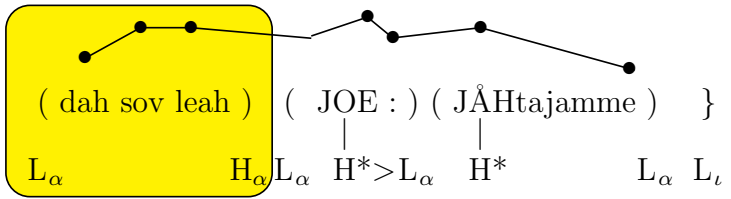
(51) { ( man åvteste ) ( NIMhtie ) }  
 $L_\alpha$   $H_\alpha$   $H^* > L_\alpha L_t$



{ ( koffør e det SÅNN ) }  
 $L_t$   $H_\alpha$   $H^* > L_\alpha L_t$

(52) dah sov Leah joe jåhtajamme  
 they PART be-3PL.PRES already set-off-PERF.PART  
 ‘I suppose they must have already broken camp and moved on.’

SA2;10

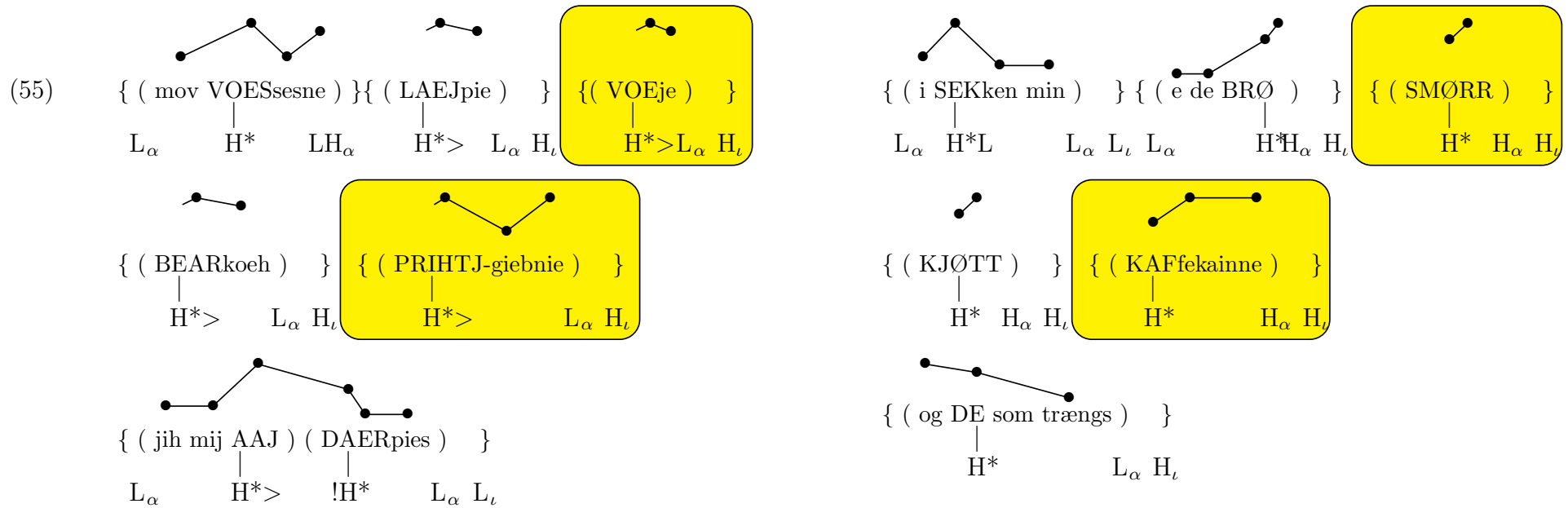


(53) { ( dah sov Leah ) ( JOE : ) ( JÅHtajamme ) }  
 $L_\alpha$   $H_\alpha$   $L_\alpha$   $H^* > L_\alpha$   $H^*$   $L_\alpha$   $L_t$

### 4.6 Continuation and lists

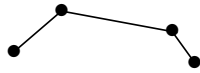
(54) mov voessesne laejpie, voeje, bearkoeh, prihtj-giebnie, jih mij aaj daerpies  
 my satchel-LOC.SG bread, butter, meat, coffee-pot, and what also necessary  
 ‘In my bag there’s bread, butter, meat, a coffee pot, and whatever else is needed.’

SA1;3



## 4.7 Given information

- (56) gæbjan leah  
 sick be:3PL.PRES  
 ‘Yes, they are sick.’ (Response to: ‘Are *your* children sick?’) SA2;4



- (57) { ( gæbjan ) ( LEAH ) }  
 $L_\alpha \quad H_\alpha \quad !H^* \quad L_\alpha \quad L_\iota$

- (58) pruvres lea  
 married be:3SG.PRES  
 ‘Yes, he is married.’ (Response to: ‘Is he married?’) SA2;11



- (59) { ( pruvres ) ( LEA ) }  
 $L_\alpha \quad H_\alpha \quad !H^* \quad L_\alpha \quad L_\iota$


- (60) nøørjen- gielem maahtam  
 Norway-GEN.SG language-ACC.SG speak-1SG.PRES  
 ‘Yes, I speak Norwegian.’ SA2;12




- (61) { ( nøørjen-gielem ) ( MAAHtam ) }  
 $L_\alpha \quad H_\alpha \quad !H^* \quad L_\alpha \quad L_\iota$

(62) Answers to yes-no questions entail a repetition of the finite verb of the question's matrix clause. The response verb is deaccented.

(63) åadtjoejim gujht  
get-1SG.PRET indeed  
'Yes, I did (get).' (In response to: 'Did you *get* any fish?') SA2;6

(64)   
{ ( åadtjoejim ) ( GUJHT ) }  
L<sub>α</sub> !H\* L<sub>α</sub> L<sub>ι</sub>

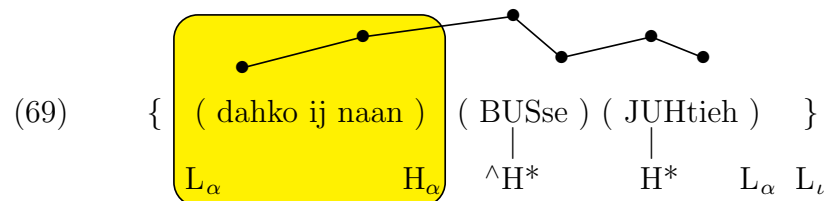
(65) vuesehtem  
show-1SG.PRES  
'(All right), I'll show (you).' (In response to: 'Show me!') SA1;8

(66)   
{ ( vuesehtem ) }  
L<sub>α</sub> L<sub>α</sub> L<sub>ι</sub>

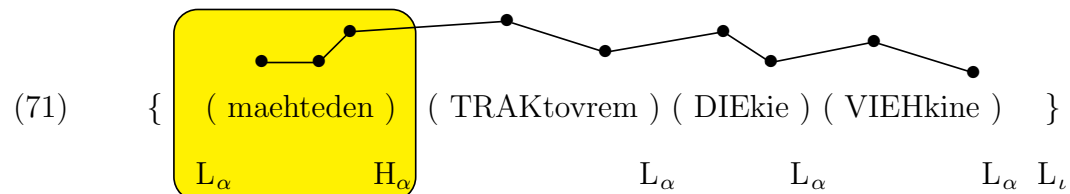
### 4.8 Phonological rules

(67) Evidence of genuine phonological rules is hard to find in intonational phonology, and therefore of great interest with respect to demonstrating the phonological nature of intonation.

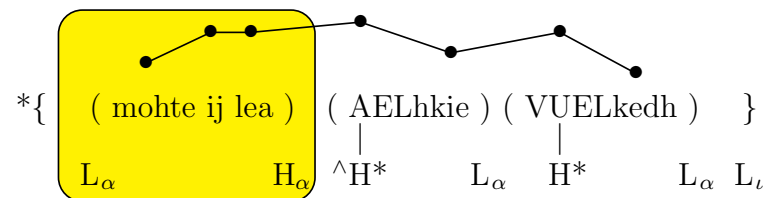
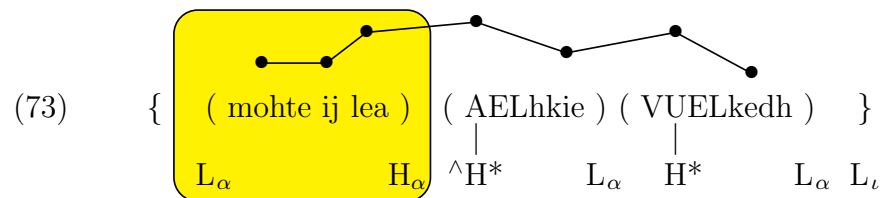
(68) dahko ij naan busse juhtieh  
 that-way NEG.3SG.PRES any bus travel:CONNeg  
 ‘No busses go that way.’ SA1;11



(70) maehteden traktovrem diekie viehkine  
 can-2DU.PRES tractor-ACC.SG here:DIR help-ESS  
 ‘Can you two get the tractor here to help?’ SA2;2

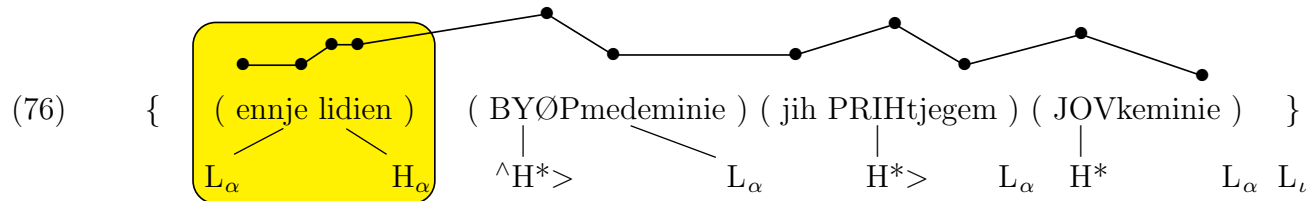


(72) mohte ij lea aelhie vuelkedh  
 but NEG.3SG.PRES be:CONNeg easy drive-INF  
 ‘But it’s not easy to drive.’ SA2;9



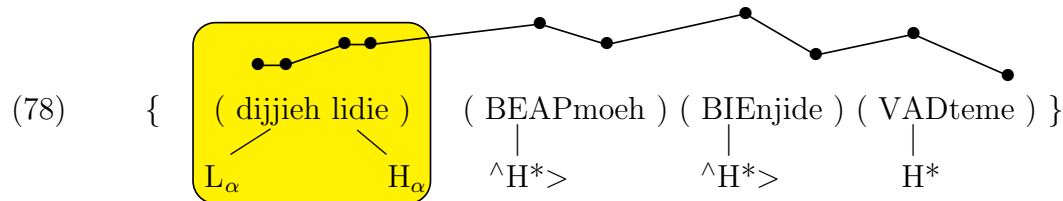
- (74) Initial accentless phrases generally have  
 a. a glissando from Low to High, or  
 b. a Low...-High pattern with a step up on the last syllable.
- (75) ennje libie byøpmedeminie jih prihtjegem jovkeminie  
 still be-1PL.PRES eat-ACT.ESS and coffee-ACC.SG drink-ACT.ESS  
 ‘We are still eating and drinking coffee.’

SA2;5



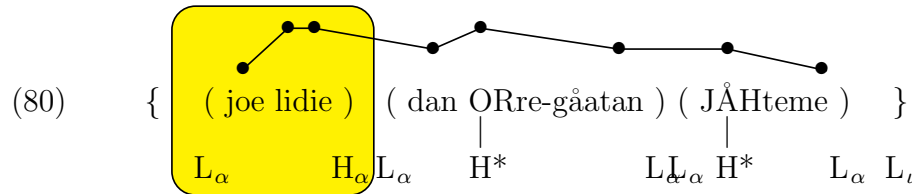
- (77) dijjieh lidie beapmoeh bienjide vadteme?  
 you-NOM.PL be-2PL.PRES food-ACC.PL dog-ILL.PL give-PAST.PPL  
 ‘Have you fed the dogs?’

SA2;5



- (79) joe lidie dan orre-gåatan jáhteme?  
 already be-2PL.PRES that-GEN new-house-ILL.SG move-PERF.PART  
 ‘Have you two already moved to the new house?’

SA2;1



## 5 Conclusions

- (81) Intonation is *language*, therefore an essential part of the description/documentation of a language.
- (82) Intonation is important in language teaching.
  - a. Controlling for intonation is crucial when illustrating contrasts with minimal pairs.
  - b. Mastery of prosody and global aspects of speech powerful (perhaps necessary) aid for learning more detailed aspects (pronunciation of individual sounds).
  - c. Focus on intonation can bring clarity to some of the harder aspects of the language, e.g. the rich system of pragmatic particles in Saami.
  - d. A powerful boost to confidence to speaking a second language.
- (83) Intonation has a potentially important role to play in revitalization.
  - a. Mastery is important to confidence, and confidence in learning reduces the probability of giving up.
  - b. Intonation can be a highly salient marker of identity.
  - c. In the future, the availability of speech technology for Saami will be important for its viability. Knowledge of intonation can make an important contribution to the development of text-to-speech and other products.

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