Workshop
1-2 February 2024

Vowel and consonant quantity in Germanic, Indo-European and beyond

Book of abstracts

v. 3

Contents

Sponsors

Swiss National Science Foundation (SNSF)

University of Zurich (UZH)

Ludwig-Maximilians-Universität München (LMU)

UZH alumni

Zürcher Hochschulstiftung

About the workshop

Vowel and consonant quantity in German, Indo-European and beyond

At the conclusion of our trinational research project on vowel and consonant quantity in southern German varieties from Germany, Austria, and Switzerland, this workshop addresses eminent issues revolving around the discussions of the (in)stability and typology of quantity contrast(s) in German and other languages. The aim of the workshop is to bring together scholars working on a variety of quantity languages (Germanic, Romance, Finno-Ugric, and others) as well as from theoretical perspectives and with different methodological approaches, ranging from phonological typology to experimental phonetics. Contributions offer, on the one hand, a systematic view on particular language families (Germanic, Romance) and the languages of the world in general, drawing on phonological databases and phonetic corpora; on the other hand, they also report recent empirical insights from production and perception experiments in specific language varieties. A particular focus lies on mechanisms of sound change, both from a larger diachronic perspective and a more sociophonetic approach to linguistic change in progress.

The workshop will take place on Thursday 1 and Friday 2 February 2024
  in the main building of the University of Zurich (Switzerland).
  Address: Rämistrasse 71, 8006 Zürich
  Room: KOL-H-317
  (cf. description of the venue on p. 21).

Talks will be 45 minutes to allow for enough room for fruitful discussions
(30 minutes presentation & 15 minutes discussion).

Contact

Phonetics Laboratory
Department of Computational Linguistics
University of Zurich

Stephan Schmid
Rämistrasse 71
CH-8006 Zürich
+41 (0)44 63 43001
stephan.schmid@uzh.ch

Programme

Thursday 1 February 2024

09:00	Welcome and introduction	Felicitas Kleber Stephan Schmid
	Chair: Guido Seiler	
09:45	Quantity and syllable structure: Cross-linguistic patterns	Ian Maddieson
10:30	Coffee break	
11:00	The synchrony and diachrony of vowel and consonant quantity in Germanic languages	B. Richard Page
11:45	Prosodic change in Central Bavarian and prosodic stability in Swiss German? Evidence from articulatory, acoustic and perceptual data	Felicitas Kleber
12:30	Lunch break	
	Chair: Volker Dellwo	
14:15	Vowel and consonant quantity in Zurich German	Stephan Schmid
15:00	Acoustic language embeddings and phonetic typology of Austrian German varieties	Michael Pucher Lorenz Gutscher
15:45	Coffee break	
16:15	A short history of long vowels: Vowel and consonant quantity in the Romance languages	Michele Loporcaro
17:00	Vowel and consonant length in Ligurian dialects and Ligurian regional Italian	Lorenzo Filipponio Davide Grassino Dalila Dipino

Friday 2 February 2024

Chair: Eleanor Chodroff

09:00	Vowel quantity in Albanian: Dialect change, acquisition and attitudes	Enkeleida Kapia Josiane Riverin-Coutlée
09:45	Czech vowel quantity: the role of vowel duration and spectrum as cues	Václav Jonáš Podlipský
10:30	Coffee break	
11:00	Consonant and vowel quantity in Hungarian and some aspects of sociophonetic variation	Katalin Mády
11:45	Vowel and consonant quantity in Estonian: typological overview and phonetic evidence	Pärtel Lippus
12:30	Lunch break	

Chair: Catalina Torres

14:15	Durational correlates of word-initial plosives and the following vowels in Korean	Yeongeun Choi
15:00	Vowel and consonant duration relationships in Australian Indigenous languages: The case of Djambarrpuyŋu	Kathleen Jepson
15:45	Coffee break	
16:15	Vowel and consonant length in the DoReCo corpus	Ludger Paschen Matthew Stave Frank Seifart
17:00	Final discussion	

Abstracts

Ian Maddieson

(University of New Mexico)

Quantity and syllable structure: Cross-linguistic Patterns

This paper describes broad tendencies relating to the distribution of quantity contrasts in vowels and consonants across the world's languages before examining patterns in acoustic segment durations that may contribute to accounting for the phonotactic patterns observed. It concludes with a brief discussion of articulatory models dealing with segment duration, which may help to relate phonotactic patterns with acoustic durations.

Agreeing on the presence and distribution of vowel and consonant quantity is often problematic, and some considerations involved are discussed, based on practice in the LAPSyD database. Currently, 357 of the 900 languages are reported with long vowels (c. 40%). In some cases, longer vowels form the basic system, with a smaller set of contrastively short vowels, e. g. in Chuvash (chv), Sebei (kpz) and Cantonese (yue). The frequency of consonant quantity is harder to establish, partly because of how data is coded, but also because phonetically long consonant intervals are open to various analyses. Geminates, analyzed as sequences of two identical consonants when they have similar distribution to clear CC sequences, occur in at least 130 of the languages, but only 7 languages are interpreted as having inherently long consonants. The latter are cases where a type of consonant occurs long but has no short counterpart, or occurs with a specific limited distribution, as in Ocaina (oca) or Archi (aqc).

As is well-known, geminates are more common in medial or final position than initial, probably because utterance initial duration is harder to perceive (Abramson 2009) and word-initial is sometimes utterance-initial. Cues to gemination in medial or final position often include shortening of the preceding vowel — part of an overall pattern of vowel shortening in closed syllables (e.g. (Maddieson 1985, Chem 2020) — a trend that may lead over time to the frequent absence of long vowels before geminates. But an alternative timing pattern spreads lengthening over both vowel and consonant (e.g. in Moroccan Arabic, Frei et al 2017). Timing models that can accommodate such differences (e.g. Smith 1992, Ham 2002) will be briefly presented and discussed.

A few references

Abramson, Arthur S. 2009. The perception of word-initial consonant length: Pattani Malay. *Journal of the International Phonetic Association* 16: 8-16.

Chem, Vatho. 2020. The Standard Khmer vowel system: An acoustic study. *Cambodia Journal of Basic and Applied Research (CJBAR), 2(2)*, 93–121.

Frej, Mohamed Yassine, Christopher Carignan & Catherine T. Best. 2017. Acoustics and articulation of medial versus final coronal stop gemination contrasts in Moroccan Arabic. *INTERSPEECH 2017* August 20–24, 2017, Stockholm.

Ham, William. 2002. *Phonetic and Phonological Aspects of Geminate Timing*. Routledge, London.

Maddieson, Ian. 1985. Phonetic cues to syllabification. In *Phonetic Linguistics* (ed. V.A. Fromkin). Academic Press, New York: 203-221.

Smith, Caroline L. 1992. *The Timing of Vowel and Consonant Gestures*. Ph. D. dissertation, Yale University.

B. Richard Page

(The Pennsylvania State University)

The synchrony and diachrony of vowel and consonant quantity in Germanic languages

The early Germanic languages had contrastive quantity for both vowels and consonants (Fulk 2018). Typologically, modern varieties of Germanic languages can be divided into three groups with regard to quantity. Some Norwegian, Swedish and Upper German dialects retain quantity for both vowels and consonants. Icelandic, Faroese, the standard varieties of Swedish and Norwegian, and Central Bavarian have consonant quantity only. Danish, English, German, and Dutch have vowel quantity only, though the existence of vowel quantity in Dutch is disputed. From a diachronic perspective, the Germanic languages that have retained consonant quantity but lost vowel quantity have undergone open syllable lengthening (OSL). The languages with only vowel quantity have undergone OSL and degemination (Riad 1995; Page 2020).

Almost all treatments of the Germanic quantity shift assume that open syllable lengthening (OSL) must precede — or perhaps coincide with — degemination to account for the lack of OSL before historical geminates, e.g., Middle Dutch *sone* > Dutch *zoon* 'son' but Middle Dutch *sonne* > Dutch *zon* 'sun' (Lahiri & Dresher 1999). However, it is clear that degemination had occurred word-finally prior to OSL in earlier varieties of the Germanic languages that would eventually lose consonant quantity in medial position, e.g, OE *bedd*, *bed* 'bed'; also OS *bed*; Middle Dutch *bedde*, *bed*, *bet*; OHG *betti*, MHG *bette*, *bet*. In contrast, Icelandic, Faroese, Norwegian, Swedish, and Upper German dialects have retained consonant quantity in medial and word-final positions. Orthographic evidence in the *Ormulum* (circa 1180) indicates that degemination had indeed occurred word-finally — and possibly medially — prior to OSL in Orm's early Middle English dialect (compare Fulk 1996; Murray 2000).

References

Fulk, Robert D. 1996. Consonant doubling and open-syllable lengthening in the *Ormulum*. *Anglia* 114, 481–513.

Fulk, Robert D. 2018. *A comparative grammar of the early Germanic languages*. Amsterdam: John Benjamins.

Lahiri, Aditi & B. Elan Dresher. 1999. Open syllable lengthening in West Germanic. *Language* 75, 678–719.

Murray, Robert W. 2000. Syllable cut prosody in early Middle English. *Language* 76, 617–654.

Page, B. Richard. 2020. Quantity in Germanic languages. In Michael T. Putnam & B. Richard Page (eds.), *The Cambridge handbook of Germanic languages*, 97–118. Cambridge: Cambridge UP.

Riad, Tomas. 1995. The quantity shift in Germanic: A typology. *Amsterdamer Beiträge zur älteren Germanistik* 42, 159–184.

Felicitas Kleber

(IPS, Ludwig-Maximilians-Universität München)

Prosodic change in Central Bavarian and prosodic stability in Swiss German? Evidence from articulatory, acoustic and perceptual data

Among the German regional varieties spoken in the D-A-CH region, those from Switzerland provide the clearest evidence for unambiguous quantity contrasts in both vowels and consonants. Vowel quality differences can be very small (see e.g. Schmid, this volume, on Zurich German) and some scholars have proposed a singleton/geminate contrast in stops (e.g., Kraehenmann 2003) given that the primary feature to distinguish long and short stops is closure duration (Ladd & Schmid 2018). Independent of whether or not this opposition in Swiss German varieties may better be treated as a fortis/lenis contrast, Swiss German varieties differ in this respect from the standard variety spoken in Germany which primarily utilizes VOT to distinguish the two sets of long (fortis) and short (lenis) stops and where vowel quality differences are an important means to set long (tense) vowels apart from their short (lax) counterparts. The situation has been less clear with respect to other regional varieties such as Central Bavarian (CB) spoken in the south-east of Germany (West CB) and Austria (mainly East CB next to other varieties) where the stop contrast is traditionally labeled fortis/lenis and where postvocalic stops predict the quantity of the preceding vowel (allophonic vowel length with quantity being somewhat more important than quality; Kleber 2020). Some of the ambiguity may arise from different methodological approaches, other from between and within-group variation in the respective parameters (e.g., closure duration). For example, between-group variation in speech production has been observed in German speakers of West CB in form of inter-generational differences where younger speakers used either closure duration to a lesser extent or VOT to a greater extent than older speakers (Kleber 2018; Thon & Kleber 2023). Within-group variation again was evident in speech production of Austrian speakers of East CB regardless of generation such that the exceptionally broad distributions in particular of closure duration lay in between that of standard German and Swiss German speakers (Klingler et al. 2019). One innovation of the cross-linguistic studies conducted in the present DACH project (see website) was to use the Swiss data as a baseline to better understand the typology as well as stability and change of vowel and consonant quantity.

In this talk, I will present results from (1) acoustic analyses to support the assumption of a sound change that is currently in progress in West CB, (2) perception tests to suggest the misalignment of production and perception in varieties showing greater acoustic variation in speech production, and (3) articulatory analyses to shed light on the complex relation between segmental quantity and the timing of articulatory gestures that can potentially explain regional differences in vowel and consonant quantity.

References

Kleber, F. (2020). Complementary length in vowel-consonant sequences: acoustic and perceptual evidence for a sound change in progress in Bavarian German. *Journal of the International Phonetic Association*, 50(1), 1–22.

Kleber, F. (2018). VOT or quantity: What matters more for the voicing contrast in German regional varieties? Results from apparent-time analyses. *Journal of Phonetics*, 71, 468–486.

Klingler, N., Kleber, F., Jochim, M., Pucher, M., Schmid, S., Zihlmann, U. (2019). Temporal organization of vowel plus stop sequences in production and perception: evidence from the three major varieties of German. *Proceedings of the 19th International Congress of Phonetic Sciences*, Melbourne, Australia, 825-829.

Kraehenmann, A. (2003). *Quantity and prosodic asymmetries in Alemannic: synchronic and diachronic perspectives*. Berlin, Mouton de Gruyter.

Ladd, D.R. & Schmid, S. (2018). Obstruent voicing effects on F0, but without voicing: Phonetic correlates of Swiss German lenis, fortis, and aspirated stops. *Journal of Phonetics* 71, 229-248.

Thon, K., Kleber, F. (2023). Phonotactically driven cue weighting in a sound change in progress: Acoustic evidence from West Central Bavarian. *Proceedings of the 20th International Congress of Phonetic Sciences*. Prague, Czech Republic, 3011-3015.

Stephan Schmid

(University of Zurich)

Vowel and consonant quantity in Zurich German

Vowel quantity is a pervasive feature of the Zurich German phoneme inventory: in stressed syllables, all of the 9 vowel qualities – i.e., /i e ɛ æ y ø œ u o ɒ/ – appear both as short and as long vowels [1, 2]; on the average, the ratio between the durations of short and long vowels amounts to 0.56. Unlike in Standard German, vowel length is not accompanied by a difference in timbre or vowel quality.

As concerns the structure of the consonant inventory, it is well-known that voiced obstruents do not occur in Swiss German dialects [2, 3]. Instead, a phonemic contrast beween homorganic plosives and fricatives is realized in terms of duration only. Traditionally, consonant quantity has been described as a phonemic opposition between *fortis* and *lenis* obstruents [2], whereas alternative analyses assume a contrast between singletons and geminates [3, 4]. Phonetically, the contrast between short (*lenis*) and long (*fortis*) plosives is based on closure duration only, whereas VOT plays no role at all [5].

Nevertheless, the plosive system cannot be analyzed in binary terms only. On the one hand, there is evidence for an additional 'marginal contrast' involving aspirated plosives, which occur in proper names as well as in loanwords from Standard German and English [2, 5]. On the other hand, the contrast between lenis and fortis obstruents is neutralized whenever two obstruents occur one after the other, yielding an obstruent of intermediate duration which has been labelled as 'half fortis' [2, 4]. Regarding the interaction between vowel and consonant quantity, four phonotactic patterns are possible (VC, V:C, V:C:, VC:). Nevertheless, the fourth pattern (short vowel + fortis obstruent) differs from the third one (long vowel + fortis obstruent), in that the obstruent exhibits a longer duration; therefore, a combinatory 'extrafortis' allophone can be distinguished [6].

References

[1]   Schmid, S. (2004). Zur Vokalquantität in der Mundart der Stadt Zürich. *Linguistik online* 20: 93-116. https://bop.unibe.ch/linguistik-online/article/view/1428/2426

[2]   Fleischer, J. & Schmid, S. (2006). Zurich German. *Journal of the International Phonetic Association* 36(2): 243-253. https://doi.org/10.1017/S0025100306002441

[3]   Kraehenmann, A. (2003). Quantity and prosodic asymmetries in Alemannic: synchronic and diachronic perspectives. Berlin, Mouton de Gruyter. https://doi.org/10.1515/9783110197228

[4]   Würth, K. (2020). *Consonant Quantity and Positional Neutralisation – Heusler's Law and Winteler's Law in Zurich German.* PhD, Univ. of Zurich.
https://www.zora.uzh.ch/id/eprint/186455/

[5]   Ladd, D.R. & Schmid, S. (2018). Obstruent voicing effects on F0, but without voicing: Phonetic correlates of Swiss German lenis, fortis, and aspirated stops. *Journal of Phonetics* 71, 229-248. https://doi.org/10.1016/j.wocn.2018.09.003

[6]   Zebe, Franka (2023). Vowel and consonant quantity in two Swiss German dialects and their corresponding varieties of Standard German: effects of region, age, and tempo. *Phonetica* 80(3-4):185-223. https://doi.org/10.1515/phon-2022-0017

Michael Pucher, Lorenz Gutscher

(Austrian Research Institute for Artificial Intelligence)

Acoustic Language Embeddings and Phonetic Typology of Austrian German varieties

Language embeddings, generated by deep neural networks, are a powerful tool that project spoken utterances or written sentences into a multi-dimensional space. Typically, the weights of the final layer of a deep neural network trained for language identification are employed to create these embeddings. When trained on textual data, research has demonstrated that these embeddings capture typological information on a symbolic level. Less work has been done on the relationship between acoustic language embeddings and phonetic typology.

In this work a wav2vec 2.0 model is employed that was fine-tuned on the task of language identification using the voxlingua107 corpus with 107 languages of web audio data to project Austrian German varieties into the embedding space and find links to phonetic typology.

To test the correlation between phonetic features, some of which could be potential typological markers, and language embeddings, we train k-NN classifiers on the language embeddings for a wide class of phonetic features, including acoustic and articulatory characteristics.

The error rate of a specific classifier reveals if the embeddings contain information about specific features. Since computations of the embeddings are done on the utterance level, we can also probe for utterance features. This allows for a more detailed examination of how these features are represented or encoded in the embeddings, which can provide insights into the nuances of spoken language varieties.

Michele Loporcaro

(University of Zurich)

A short history of long vowels: Vowel and consonant quantity in the Romance languages

Latin had contrastive quantity for both consonants and vowels but none of the Romance languages has preserved the latter. Thus, Proto-Romance must be reconstructed as featuring contrastive consonant gemination, which survives in the eastern part of the Romance-speaking territory (Wartburg's 1936 eastern Romance), whereas vowel phonemes were not specified for length at that stage. Another trait that can be reconstructed for Proto-Romance is an allophonic rule lengthening stressed vowels in non-final open syllables (short, OSL) identical to that operating today in standard Italian, all Italo-Romance dialects south of the La Spezia-Rimini line (Wartburg's 1936 border between eastern and western Romance) and Sardinian, which I will label type A. The rest of the Romance languages and dialects fall into two further types: on the one hand, languages lacking contrastive gemination and contrastive vowel length (type B, including Daco- and Ibero-Romance all along their documented history, as well as, today, most of Gallo-Romance); and, on the other hand, languages lacking contrastive gemination but displaying contrastively long vs short vowels (type C, including most of northern Italo-Romance as well as part of Raeto- and Gallo-Romance, but which arguably stretched from the Apennines to the North Sea in the Middle Ages).

The assumption of the rise of OSL is the cornerstone of the traditional reconstruction of the Latin-Romance transition, as for the phonology (see e.g. Schuchardt 1866-68: 3.44, Weinrich 1958, Loporcaro 2015), since this assumption automatically explains the demise of Latin contrastive vowel length. That the latter fell victim to the rise of such a rule not only warrants the most economical reconstruction but is also supported by the philological record, under the form of metric inscriptions and metalinguistic remarks by Latin grammarians from the late Western Empire (see Herman 1982). True, many have questioned the very existence of OSL in Italian (notably McCrary Kambourakis 2007), but such arguments have proved inconclusive (Loporcaro 2015, 2018). Rather, careful inspection of the experimental phonetic evidence available on Romance languages and dialects not only is compatible with the OSL (in today's type A varieties) but also proves crucial to the understanding of the rise and fall of phonemically long vowels in type C dialects.

References

Herman, József. 1982. Un vieux dossier réouvert: les transformations du système latin des quantités vocaliques. *Bulletin de la Société de Linguistique* 77: 285-302; repr. in Herman, József. 1990. *Du latin aux langues romanes. Etudes de linguistique historique*. Tübingen: Max Niemeyer, 217-231.

Loporcaro, Michele. 2015. *Vowel length from Latin to Romance*. Oxford: Oxford University Press.

Loporcaro, Michele. 2018. *On the subordinate status of the choice between formal and substantive explanation for sound change.* In Fernando Sánchez Miret & Daniel Recasens (eds), *Production and Perception Mechanisms of Sound Change.* München: Lincom Europa, 71-89.

McCrary Kambourakis, Kristie. 2007. *Reassessing the role of the syllable in Italian phonology. An experimental study of consonant cluster syllabification, definite article allomorphy and segment duration.* New York: Routledge.

Schuchardt, Hugo. 1866-68. *Der Vokalismus des Vulgärlateins*. 3 vols. Leipzig: Teubner.

Wartburg, Walther von. 1936. Die Ausgliederung der romanischen Sprachräume. *Zeitschrift für romanische Philologie* 56: 1-48.

Weinrich, Harald. 1958. *Phonologische Studien zur romanischen Sprachgeschichte*. Münster Westfalen: Aschendorff.

Lorenzo Filipponio[1], Davide Garassino[2], Dalila Dipino[3]

([1]University of Genoa, [2]ZHAW School of Applied Linguistics, [3]University of Zurich)

Vowel and consonant length in Ligurian dialects and Ligurian regional Italian

The definition of a 'standard' variety for Italian has traditionally been challenging, especially at the phonetic level, because of a multitude of distinct regional accents, as is well know from the literature [1]. In addition to the substratum influence of the dialects, today we are also witnessing processes of standardization and convergence due to contact between high and low varieties [2].

In this study, we focus on a phonological asymmetry regarding consonant and vowel length. While "Standard" Italian presents consonant length contrasts, several Northern Italo-Romance varieties rely instead on vowel length contrasts. In Ligurian, even within the same region, we find some varieties, such as Genoese, with vowel quantity, and others, such as Intemelian, without any length contrasts. Previous work on both varieties has shown that in Genoese there is a complementary effect between the duration of stressed vowels and post-stress consonants [3]. Individual variation is, however, large [4]. In Intemelian, on the other hand, no complementary effects emerged as well as no sign of vowel or consonant length. Therefore, we could expect different scenarios in the corresponding regional varieties of Italian based on the dynamics of language contact. If the process of "standardization" is advanced, as for gemination in different regional varieties of Italian [5], no significant differences should emerge in the regional Italian data from both Genoese and Intemelian speakers. On the contrary, we might detect different V to C ratios, depending on the presence or absence of vowel quantity in their respective dialects.

To this end, we compared spontaneous dialogic speech in regional Italian and in the dialect of 8 Ligurian speakers, 4 speakers of Genoese and 4 speakers of Intemelian varieties. Regional Italian speech was automatically transcribed via YouTube, manually checked, and then automatically segmented/annotated via WebMAUS according to a semi-automatic workflow [6]. Dialect speech, on the other hand, was segmented and annotated entirely manually. For the analysis, words, (stressed and unstressed) vowels and (post-stress) consonants were extracted. Finally, the average duration of vowels and consonants and their ratio were compared for each speaker in Italian and in the dialects.

References

[1]   Bertinetto, P. M. & Loporcaro, M. 2005. The sound pattern of Standard Italian, as compared with the varieties spoken in Florence, Milan and Rome. *JIPA*, *35*(2), 131-151.

[2]   Cerruti, M. & Regis, R. 2014. Standardization patterns and dialect/standard convergence: a North-Western Italian perspective. *Language in Society*, *43*(1), 83-111.

[3]   Garassino, D. & Dipino, L. 2019. Vowel length in Intemelian Ligurian. An experimental and cross-dialectal investigation, in *Proceedings of the 19th International Congress of Phonetic Science 2019*, University of Melbourne. https://assta.org/proceedings/ICPhS2019/papers/ICPhS_171.pdf

[4]   Dipino, D., Filipponio, L. & Garassino, D. 2022. Manifestazioni della quantità vocalica nella Liguria centro-occidentale: tipologia e metodologia. In L. Baranzini, M. Casoni & S. Cristopher (eds.), *Linguisti in contatto 3 - Ricerche di linguistica italiana in Svizzera e sulla Svizzera*, pp. 17-37. OLSI.

[5]   De Iacovo, V. & Mairano, P. 2020. Gemination in Northern versus Central and Southern Varieties of Italian: A Corpus-based investigation. *Language and Speech, 63*(3), 608-634.

[6]   Cangemi, F., Fründt, J., Hanekamp, H. & Grice, M. 2019. A semi-automatic workflow for orthographic transcription and syllabic segmentation. In D. Piccardi, F. Ardolino, S. Calamai (eds.), *Gli archivi sonori al crocevia tra scienze fonetiche, informatica umanistica e patrimonio digitale*, Studi AISV 6: 419-425. Officinaventuno. https://www.aisv.it/StudiAISV/2019/vol_6/024_CangemiFrundtEtAlii.pdf

Enkeleida Kapia[1,2] & Josiane Riverin-Coutlée[1]

([1]IPS, Ludwig-Maximilians-Universität München, [2]Academy of Albanological Sciences, Tirana)

Vowel quantity in Albanian: Dialect change, acquisition and attitudes

This presentation covers recent research focusing on vowel quantity in Albanian, a language of the Indo-European family spoken by 7 million people worldwide. Albanian comprises two main dialects, Gheg and Tosk, differentiated by several linguistic features, among which vowel quantity: Gheg uses length contrastively, whereas the phonological inventory of Tosk comprises only short vowels. First, we summarize the results of an apparent time study on Gheg spoken in urban and rural areas by adults and first grade children [1]. While both urban and rural Gheg show more or less advanced stages of dialect leveling, in sharp contrast with two speech features (monophthongization and rounding of /a/), vowel length is found to be well preserved in both areas, by adults and children alike. Second, we introduce the results of a follow-up longitudinal study on the development of vowel length over primary school, examining a cohort of 10 Ghegspeaking children when in 1st, 2nd and 5th grades [2]. Overall, vowel duration and variability are seen to be progressively reduced towards adult-like values from 1st to 5th grade. In addition, this study confirms the stability of the vowel length contrast in Gheg. Third, we discuss the results from another study measuring attitudes of Tosk- and Gheg-speaking Albanians towards four speech features differentiating Tosk and Gheg [3].

For three of these features (monophthongization, rounding of /a/, nasalization), Tosk variants are rated by listeners as more educated than Gheg variants. The fourth feature, vowel length, triggers a different reaction: Gheg variants do not get recognized as Gheg, even by Gheg listeners themselves, and are rated as uneducated. These results are brought together in a discussion on the role of length as a morphological marker in Gheg, the cognitive representation of vowel length during acquisition, and the apparent mismatch between representations and production. We also advance some hypotheses to be tested in ongoing and future research.

Selected References

[1] Riverin-Coutlée, Josiane, Enkeleida Kapia, Conceição Cunha & Jonathan Harrington (2022). Vowels in urban and rural Albanian: The case of the Southern Gheg dialect. *Phonetica* 79(5). 459–512.

[2] Kapia, Enkeleida, Josiane Riverin-Coutlée, Conceição Cunha & Jonathan Harrington (2023). A longitudinal study of contrastive length in Albanian-speaking children. In Paris Gappmayr & Jackson Kellogg (eds.), *Proceedings of BUCLD 47*, vol. 2, 421–431. Somerville: Cascadilla Press.

[3] Riverin-Coutlée, Josiane, Enkeleida Kapia & Michele Gubian (in preparation). *Dialect change and language attitudes in Albania.*

Václav Jonáš Podlipský

(Palacký University Olomouc)

Czech vowel quantity: the role of vowel duration and spectrum as cues

Czech has 5 pairs of phonologically short and long monophthongs: /ɪ/–/iː/, /ɛ/–/ɛː/, /a/–/aː/, /o/–/oː/, and /u/–/uː/. Since /ɪ/–/iː/ differ clearly spectrally as well as in duration, and /ɛ(ː)/ are lower than /o(ː)/, the system is not perfectly symmetrical (Šimáčková et al. 2012). In my talk, I will review research that explored the perception and production of Czech vowel quantity.

Podlipský et al. (2009) found that the spectral difference between /ɪ/ and /iː/ served as a strong perceptual cue to the contrast. That study also showed that the durational distinction of /ɪ/–/iː/ in production was reduced as compared to the other quantity pairs. Later production measurements (Skarnitzl & Volín 2012, Paillereau & Chládková 2019) found a clear spectral differentiation of /u/–/uː/ too, as well as slight spectral differences within the non-high pairs. Podlipský et al. (2019) then tested the weighting of duration and spectrum as cues to all the Czech monophthongs for both the major varieties of Czech: Bohemian and Moravian. This study replicated the finding that both duration and spectrum cue the /ɪ/–/iː/ contrast (for Bohemians spectrum even outweighed duration), and spectrum was found to cue /u/–/uː/ reliably too. In addition, the probability of a long-vowel percept was influenced by the slight spectral differences existing between the non-high vowels.

In summary, it appears that Czech, traditionally described as a pure quantity language, now has vowel quantity pairs distinguished both by duration and, at least for the high vowel pairs, also by spectral quality, with the front-back symmetry appearing to reestablish itself, as is often the case diachronically. The findings for high vowel pairs show an interesting perception-production interaction, whereby a reduced need for a cue in perception coincides with a diminished production of that cue (e.g., Lindblom 1990).

References

Lindblom, B. (1990). Explaining phonetic variation: A sketch of the H&H theory. In: Hardcastle, W.J., Marchal, A. (Eds.) *Speech Production and Speech Modelling. NATO ASI Series*, vol 55. Springer, Dordrecht. https://doi.org/10.1007/978-94-009-2037-8_16

Paillereau, N., & Chládková, K. (2019). Spectral and temporal characteristics of Czech vowels in spontaneous speech. *Acta Universitatis Carolinae, Philologica, Phonetica Pragensia* 2019(2), 77-95. https://karolinum.cz/data/clanek/7245/Phil_2019_2_0077.pdf

Podlipský, V. J., Chládková, K., & Šimáčková, Š. (2019). Spectrum as a perceptual cue to vowel length in Czech, a quantity language. The Journal of the Acoustical Society of America, 146(4), EL352-EL357. https://doi.org/10.1121/1.5128223

Podlipský, V. J., Skarnitzl, R., Volín, J. (2009). High Front Vowels in Czech: a Contrast in Quantity or Quality? *Proceedings of Interspeech 2009* Brighton, 132-135. https://fonetika.ff.cuni.cz/wp-content/uploads/sites/104/2015/10/PodlEtal09-I.pdf

Šimáčková, Š., Podlipský, V. J., & Chládková, K. (2012). Czech spoken in Bohemia and Moravia. *Journal of the International Phonetic Association*, 42(2), 225-232. https://doi.org/10.1017/S0025100312000102

Skarnitzl, R., & Volín, J. (2012). Referenční hodnoty vokalických formantů pro mladé dospělé mluvčí standardní češtiny [Referential values of vowel formants in young adult speakers of Standard Czech]. *Akustické listy*, 18(1), 7-11. https://fonetika.ff.cuni.cz/wp-content/uploads/sites/104/2015/10/SkaVol12-formanty.pdf

Katalin Mády

(HUN-REN Hungarian Research Centre for Linguistics)

Consonant and vowel quantity in Hungarian and some aspects of sociophonetic variation

In Hungarian, both consonant and vowel quantity are contrastive. Vowel length is distinctive in many stems and subject to few constraints, while the length of consonants is often predictable by phonotactics (see Sipár & Törkenczy 2000 for an overview). All 24 consonants except for /j/ appear as geminates in the phoneme inventory, because they often occur at the boundaries of stems and inflectional suffixes, leading to a heavier functional load in plurimorphemic words than in uninflected lexemes (Neuberger 2022). The vowel inventory contains 14 vowels that are organised in seven vowel pairs based on their phonological behaviour, i.e., they are all distinctive, and they participate in morphological alternation processes (e.g., word-final lengthening, systematic shortening in certain stems). Vowel pairs show a different behaviour with respect to vowel height. (1) Short and long high /i y u/ participate seldom in phonological opposition, they are next to identical in their spectral characteristics, and there is a strong shortening (neutralising) tendency in colloquial speech and certain dialects. (2) Mid /o ø/ are more frequently in opposition, but only the long vowel appears in word-final position. The short vowel is more open than its long counterpart, but they do not belong to separate perceptual categories (Mády & Reichel 2007). (3) The phonologically low vowel pair /ɛ - eː/ differs in height, the low /ɒ - aː/ pair is distinguished by rounding. These two vowel pairs participate in a large number of oppositions. The duration ratio of short/long vowels increases along with the distinctive power, especially in unstressed position, high vowels being least and low ones being most different (Mády, Bombien & Reichel 2008). Increasing differences from high over mid to low vowels wrt duration and quality are a potential trigger for neutralisation in high vowels spreading to mid vowels, as was shown for younger and more innovative speakers (Mády 2010a,b), along with increasing functional load (Mády & Reichel 2019).

References

Mády, Katalin & Reichel, Uwe D. (2007). Quantity distinction in the Hungarian vowel system – just theory or also reality? *Proc. 16th International Congress of Phonetic Sciences*. Saarbrücken, 1053–1056.

Mády, Katalin., Bombien, Lasse & Reichel, Uwe D. (2008). Is Hungarian losing the vowel quantity distinction? *Proc. 8th International Seminar on Speech Production*. Strasbourg, 445–448.

Mády, Katalin (2010a): Shortening of long high vowels in Hungarian: a perceptual loss? *Proc. Sociophonetics at the crossroads of speech variation, processing and communication*, Pisa, 41–44.

Mády, Katalin (2010b): Hungarian vowel quantity neutralisation as a potential social marker. *Acta Linguistica Hungarica 57 (2–3)*, 167–188.

Mády, Katalin & Reichel, Uwe D. (2019): Analogy by frequency: a possible reason for the vowel length neutralisation process? In: Gyuris, B., Mády, K., Recski, G. (eds), *K + K = 120: Papers dedicated to László Kálmán and András Kornai on the occasion of their 60th birthdays*. Budapest: Research Institute for Linguistics, Hungarian Academy of Sciences, 369–384.

Neuberger, Tilda (2022): A magyar gemináták típusainak temporális korrelátumai. [Temporal correlates of geminate types in Hungarian.] In: Mády K., Markó A. (eds.), *Általános Nyelvészeti Tanulmányok* 34. Budapest: Akadémiai Kiadó, 81–110.

Siptár, Péter & Törkenczy, Miklós (2000): *The phonology of Hungarian*. Oxford: University Press.

Pärtel Lippus

(University of Tartu)

Vowel and consonant quantity in Estonian: typological overview and phonetic evidence

Estonian has a three-way quantity system that is productive for both vowels and consonants in the stressed syllable. In the light of the phonological typology of the world's languages, Estonian quantity is quite unique: there are languages with three-way vowel length around the world, but only a few Finno-Ugric languages have three-way consonant length. However, rather than a segmental property, the Estonian three-way quantity is a higher-level prosodic feature, that involves lengthening patterns within the rhythmic feet and pitch as a secondary cue. This has also allowed interpretations that break the three-way system up into a binary short-long opposition of segments and two accentuation patterns in the long syllables. In any case, the system yields three distinctive temporal patterns.

In this presentation I will provide an overview of the rich history of studies on Estonian quantity and then try to illustrate the findings by replicating the results of a previous study (Lippus et al. 2013) on a larger sample from the same spontaneous speech corpus that was used in the original study.

Reference

Lippus, P., Asu, E., Teras, P., & Tuisk (2013). Quantity-related variation of duration, pitch and vowel quality in spontaneous Estonian. *Journal of Phonetics 41*(3), 17-28

Yeongeun Choi

(University of Zurich)

Durational correlates of word-initial plosives and the following vowels in Korean

The three types of Korean plosives (fortis, lenis, aspirated) are distinguished by *Voice onset time* (VOT) [1, 5], *Closure duration* (CD) [4, 2], and the duration of their adjacent vowels [3]. These durational cues vary in either direct or inverse proportion, suggesting a potential correlation between them. As far as we know, no studies have addressed this yet.

The present study investigates the durational compensation in word-initial Korean plosives and the following vowels, focusing on the correlations between CD, VOT, and vowel duration. Drawing on production data collected from 15 native Korean speakers, we analyzed two types of durational interaction: (1) between CD and VOT of the target plosive, and (2) between the plosive (CD plus VOT) and the following vowel.

The results reveal two significant durational correlations. Firstly, within plosives, CD negatively correlates with VOT in a compensatory behavior across plosive types and places of articulation. The durational adjustment was primarily driven by CD. Additionally, the VOT shortening of aspirated plosives contributes towards the robustness of this durational compensation.

Furthermore, total plosive duration and vowel length are significantly interdependent in terms of a complementary relation. In particular, VOT considerably influenced the duration of the following vowel across place and manner of articulation: vowels are longer after unaspirated plosives than after (slightly/strongly) aspirated plosives. These findings also suggest that the adjacency between plosives and vowels itself plays a key role in compensatorily adjusting their durations.

In conclusion, the durational cues of Korean plosives in CV sequences are closely interrelated in both intrasegmental contexts (within a plosive) and in intersegmental contexts (between plosive and vowel). Specifically, the preceding cue significantly influenced the durational adjustment of the following cue in each respective segmental context, namely, in the transition from CD to VOT and from VOT to the following vowel.

References

[1] Cho, T., Jun, S.-A., & Ladefoged, P. (2002). Acoustic and aerodynamic correlates of Korean stops and fricatives. *Journal of Phonetics*, *30*(2), 193–228.

[2] Cho, T., & Keating, P. A. (2001). Articulatory and acoustic studies on domain-initial strengthening in Korean. *Journal of Phonetics*, *29*(2), 155–190.

[3] Jun, S.-A., Beckman, M., Niimi, S., & Tiede, M. (1998). Electromyographic evidence for a gestural-overlap analysis of vowel devoicing in Korean. *UCLA Working Papers in Phonetics*, 1–42.

[4] Lee, S. H. (1998). On the effects of places articulation of stops on their closure duration in Korean. *The Journal of the Acoustical Society of Korea*, *17*(6), 8–13.

[5] Silva, D. J. (2006). Acoustic evidence for the emergence of tonal contrast in contemporary Korean. *Phonology*, *23*(2), 287–308.

Kathleen Jepson

(IPS, Ludwig-Maximilians-Universität, München)

Vowel and consonant duration relationships in Australian Indigenous languages: The case of Djambarrpuyŋu

Of 392 Australian languages recently incorporated in to PHOIBLE (Moran & McCloy, 2019; Round, 2019), 183 languages have contrastive length for at least one vowel. Length is therefore a fairly common feature in these languages; however, we know very little about it from a phonetic perspective, nor do we know about the phonetic effects on other segments' duration. This talk focuses on contrastive vowel length in Djambarrpuyŋu. In Djambarrpuyŋu, vowel length is proposed to be contrastive in the initial syllable of words (the main stressed syllable). Closely related languages are not always analysed as having contrastive vowel length, but they are often reported to have a durational relationship between the vowel in the word-initial syllable and the following consonant, most frequently when the word is disyllabic and the consonant is intervocalic. The relationship is complementary, with shorter vowels being followed by longer consonants, and vice versa.

It has been proposed that historically most Australian languages had contrastive vowel length (Dixon, 2002). The feature is suggested to have been lost in many languages, and in some, reanalysed as a consonant length contrast. In the Yolŋu languages, of which Djambarrpuyŋu is a member, two series of stops — described as fortis/lenis, voice/voiceless, short/long, or singleton/geminate — are often posited. This factor has contributed in part to the confusion around the status of segment duration in Yolŋu languages, and the diverse analyses for similar phonetic outcomes.

Acoustic and perceptual analyses will be presented, examining segment duration in disyllabic words with different syllabic structures. The evidence does support contrastive vowel length in Djambarrpuyŋu. However, there appears to be other underlying mechanisms that result in the segment duration patterns observed. The talk will conclude with a discussion of how the findings fit within phonological analyses of related languages and our understanding of vowel length contrasts and complementary durational relationships cross-linguistically.

References

Dixon, R.M.W. (2002). *Australian languages: Their nature and development*. Cambridge, Cambridge University Press.

Moran, S. & D. McCloy (2019). *PHOIBLE 2.0.* Jena, Max Planck Institute for the Science of Human History. http://phoible.org.

Round, E. (2019). *Australian phonemic inventories contributed to PHOIBLE 2.0: Essential explanatory notes*. DOI: 10.5281/zenodo.3464333.

Ludger Paschen[1], Matt Stave[2], Frank Seifart[1]

([1]ZAS Berlin, [2]CNRS Lyon)

Segmental quantity and duration across languages: Evidence from the DoReCo corpus

In this talk, we explore the distribution and duration of long and short vowels and consonants across a broad cross-linguistic sample from the DoReCo corpus. DoReCo (Language DOcumentation REference COrpus, https://doreco.huma-num.fr/) contains spoken language corpora from 51 languages, focusing on datasets that originated in fieldwork-based documentations of small and endangered languages, carried out by DoReCo contributors. DoReCo contains over 100 hours of audio-recorded, mostly narrative texts with transcriptions that are time-aligned at the phone level, translations, and – for a subset of languages – also time-aligned morphological annotations. DoReCo data are freely accessible under Creative Commons licenses, providing the language sciences with fully contextualized, spoken data from a diverse sample of the world's languages.

The time-aligned data in DoReCo provide an opportunity to explore the cross-linguistic properties of durational patterns of natural speech. We will first describe the distribution of long and short vowels and consonants across the 51 languages in DoReCo, a sample representing a wide range of phonological inventories and phonotactic systems. Then, we will proceed to analyze the acoustic duration of vowels and consonants as a function of quantity, taking into account a range of other factors that have been reported to influence the temporal extension of segments. These factors include position within a phrase (initial/final lengthening), word length (polysyllabic shortening), quality for vowels and major sound class for consonants (intrinsic duration), syllable structure, token frequency, and morphological status. We will outline the general trend of how these factors affect segmental duration, and how they interact with each other.

Venue

1) Transfer from Airport to Zurich Main station (journey of 9-13 minutes)
There are several train connections every hour (see timetable at https://www.sbb.ch/en).
At the airport, there is a ticket machine before you descend to the platforms.

Select English,
Select Destination Zurich Main station (HB)
Immediate departure, Direct route
Single ticket, 2nd class, Adult

The price should be 7.00 CHF

Remember that Switzerland has its own currency (Swiss Francs, CHF); not everywhere are Euros accepted. However, the ticket machine should accept credit cards. Otherwise, you may change money at the airport.

2) Workshop location: University of Zurich, Rämistrasse 71, 8006 Zürich.
From Zurich Main station:
– either Tram 6 or 10 (stop ETH/Universitätsspital),
– or Tram 3 or Bus 31 (stop Neumarkt),
– or 20 min walking (there are stairs to climb …)
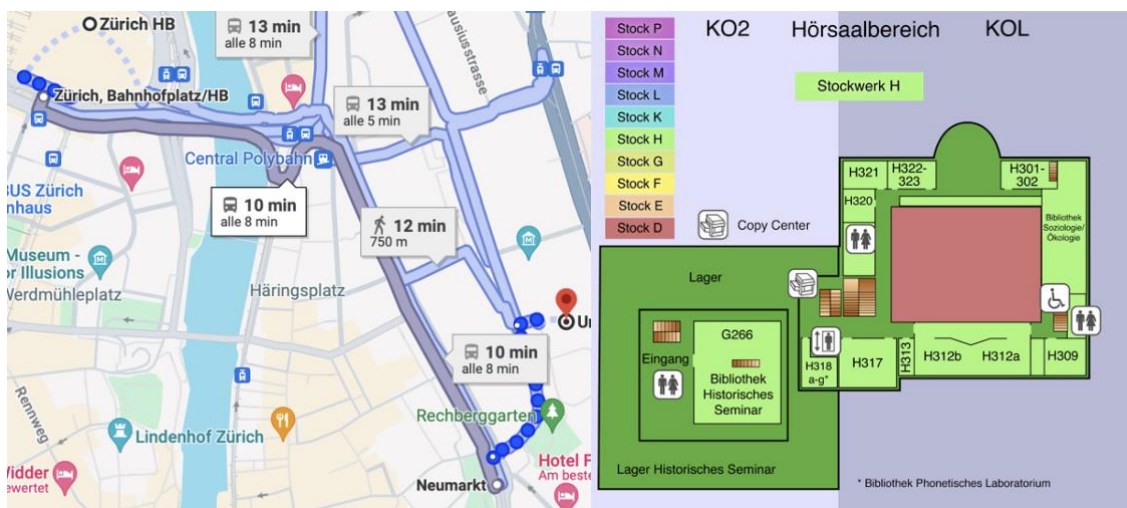
3) Room: KOL-H-317 is located at the third floor, near the elevator.