

Introduction: The Phonetic Typology (PhonTyp) Project

LEE, Seunghun J.
SHINAGAWA, Daisuke
KURABE, Keita

1. Background
2. Papers in This Volume
3. Future Directions for the PhonTyp Project

1. Background

This edited volume contains a collection of papers that explore various aspects of phonetic typology. Typological studies on morphosyntactic structures (Chelliah & De Reuse 2010; Croft 2022) or phonological systems (Maddieson 2010; Gordon 2016; Moran & Easterday & Grossman 2023) are relatively common, but phonetic typology remains a field that needs further exploration. From April 2021, a group of researchers specializing in the phonetics or phonology of diverse languages has been meeting regularly over the past three years to discuss and explore issues related to phonetic typology. These meetings are part of the ILCAA joint research project “Phonetic Typology from Cross-Linguistic Perspectives (PhonTyp).”

Exploration of phonetic typology is challenging because it requires the availability of quality recordings that are recorded in a manner that enables cross-linguistic comparison. Two studies examined data from the Illustrations of the International Phonetic Alphabet (IPA), which is published as part of the *Journal of the International Phonetic Association*. Baird *et al.* (2022) address the question regarding the amount of phonetic materials to represent the sound system of a language. Using recordings of the story “North Wind and the Sun (NWS)” from Illustrations of 156 languages, they report that most versions of the NWS story do not include all the allophones present in a language. Perhaps, unsurprisingly, the rarer a phoneme is, the less frequently it was observed in the Illustrations, suggesting a different type of text or a longer text is needed to capture a full phonetic typology. Whalen *et al.* (2022) assess the degree of phonetic documentation from three sources: Illustrations, articles in *Journal of Phonetics (JPhon)*, and papers from Ladefoged & Maddieson (1996) Sounds of the World’s Languages (SOWL) documentation project. Based on 23 categories for phonetic documentation (10 for consonants, 7 for vowels, 6 for suprasegmentals), they

DOI: <https://doi.org/10.15026/0002000623>



This work is licensed under a Creative Commons Attribution 4.0 International license.
<https://creativecommons.org/licenses/by/4.0/>

found that Illustrations and JPhon articles report measurements pertaining to 12% of the categories, while the SOWL studies covered on average about 41% of the categories. These results show that phonetic documentation still requires much work, and so does the study of phonetic typology that needs such documentation data. Creating resources for conducting phonetic typology work is challenging, as it often requires computation skills. Corpora that are built to investigate phonetic typology are being developed; for example, an openly available corpus such as VoxClamantis v1.0 (Salesky *et al.* 2020), which includes data from 635 languages.

Phonetic typology studies have been conducted in two different ways. First, some studies investigate phonetic aspects of sounds in a language or a language family: preaspiration (Clayton n.d.) and rhotics (Nance & Kirkham 2022) in Scottish Gaelic, glottalized sonorants in Gitksan (Um 1999), and post-velar consonants in Interior Salish languages (Bessell 1992). Second, fewer studies focus on single classes of sounds and explore phonetic aspects across multiple languages: voice onset time in 18 languages (Cho & Ladefoged 1999), the relationship between voicing and fricatives in 4 languages (Bjorndahl 2022), and nasalized fricatives in 3 languages (Shosted 2006). Uncommon or rare sounds tend to be understudied in phonetic research, creating a bias towards common sounds. Addressing this concern calls for the study of the phonetics of under-documented languages (cf. McDonough & Whalen 2008; Maddieson 2016; Gordon 2017, all of them about native American languages).

In this context, the current volume presents twelve papers that predominantly explore uncommon sounds of under-documented languages, shedding light on previously overlooked aspects of phonetic research. In Section 2, the 12 papers will be briefly introduced, and in Section 3, future directions of this phonetic typology research will be discussed.

2. Papers in This Volume

The topics of the papers in the volume target three areas: (i) laryngealized plosives and fricatives, (ii) atypical sonorants such as lateral fricatives, voiceless nasals, and interdental approximants, and (iii) prosodic patterns. A wide range of languages from various language families is included such as Mongolic (Mongolian), Sino-Tibetan (Jinghpaw, Burmese, Mizo, Drenjongke (Bhutia), Angami), Bantu (Swahili, Shingazidja, Tshivenda, Northern Sotho, IsiXhosa, IsiZulu, IsiNdebele, Xitsonga), Austronesian (Kagayanen), Iroquoian (Cherokee), and Japonic (Northern Ryukyuan).

In the first four papers, laryngeal characteristics in obstruents are examined. In Khalkha Mongolian, word-medial aspiration in stops and affricates was described as preaspiration. In his paper (Ueta), preaspiration appears after a vowel, but after another obstruent, the aspiration is realized after the burst, suggesting variable realization of aspiration depending on the phonetic context. The preaspiration in Cherokee (Uchihara) is observed exclusively in /s/ and not in other obstruents. Moreover, the preaspiration pattern interacts with phonological alternation such as vowel deletion and laryngeal alternation,

which raises an interesting question about whether or how to represent phonetic information in the phonological representation.

The Northern Ryukyuan paper (Aoi) reports how glottalized consonants are realized in the Ie dialect of Okinawan. He reports that glottalized consonants are realized with a shorter duration and a more abrupt onset than non-glottalized consonants. Examining phonetic characteristics in merging sounds reveals interesting patterns. A phonetic study of aspirated fricatives (Kurabe & Lee) reveals that aspiration duration in Jinghpaw and Burmese aspirated fricatives is much shorter compared to Korean. These cross-linguistic results suggest that aspirated fricatives may not be realized with identical aspiration duration.

The next four papers concern sounds that may display both obstruent-like and sonorant-like features: fricatives that are lateral, and nasals that are voiceless. A typological overview of lateral fricatives (Shinagawa & Lee) in Southern Bantu languages reports the distribution of these fricatives based on phonetic data from six Bantu languages (Tshivenda, Northern Sotho, IsiXhosa, IsiZulu, IsiNdebele, Xitsonga); voiceless lateral fricatives show more restrictive distribution than voiced lateral fricatives in the post-nasal environment.

The acoustic characteristics of voiceless nasals in Mizo, Angami, and Drenjongke (Bhutia) are explored in detail. Mizo and Angami are two Tibeto-Burman languages that Bhaskararao & Ladefoged (1991) mention as examples of two types of phonetic realization of voiceless nasals, and the two studies in this volume add new phonetic characteristics of these nasals. The Mizo study (Sarmah & Lalminghlui) reports acoustic parameters that correlate with different places of articulation of voiceless nasals. In the Angami paper (Terhija & Sarmah), nasality in the vowel following voiceless nasals is shown to be less present than that in the vowel after voiced nasals. In Drenjongke (Bhuthia), voiceless nasals are reported to be an innovative sound pattern (Guillemot & Lee). Individual variation in the realization of voiceless nasals suggests that nasality gesture must precede the laryngeal gesture, but not the other way around.

The interdental approximant in Kagayanen (Yamamoto) is a typologically rare speech sound although it has been reported in several Austronesian languages. Compared to the alveolar lateral approximant, the interdental approximant shows lower F2 and smaller F2-F1 values.

The next two papers concern the prosody of particles in several Bantu languages. In Zanzibar Swahili, *tu* is an exclusive particle meaning ‘only’. This particle is realized with a high pitch, but interestingly the paper (Abe, Lee, Kamano & Miyazaki) shows that the overall sentence prosody is identical whether the particle *tu* is present or not. A comparative study on the prosody of question elements in Shingazidja and Xitsonga (Patin & Lee) shows that the prosody of the question elements varies by the distribution of the question elements in each language; Shingazidja prefers the clause-final position for the question elements, whereas question elements in Xitsonga are realized mostly non-clause-final position.

The last paper (Lee & Suzuki) in this volume reports a phonetic typology of laryngeal contrasts, using data from the Illustrations of the IPA. After creating a corpus of recordings of plosives from 103 languages, the paper presents VOT data in languages with 2-way,

3-way or 4-way laryngeal contrast. Although the corpus is small in size, the results show that VOT is more constrained in the voiceless unaspirated category in languages with a 2-way or a 3-way laryngeal contrast.

3. Future Directions for the PhonTyp Project

The first phase of this phonetic typology project mainly focused on plosives, fricatives, and nasals. The twelve papers in this volume embody the research results and show that we now understand a little bit more about the phonetic aspects of various languages. From April 2024, the second phase of the project will begin to continue to explore further aspects of phonetic typology focusing on various types of liquids and vowels, which are not always fully examined from cross-linguistic perspectives. The research project will not only explore the phonetics of these sounds in individual languages or language families, but also in the wider context of phonetic typology by reporting on the commonalities and differences of the sounds. Last but not least, we thank the anonymous reviewers who shared their valuable time and provided constructive suggestions during the review process.

References

- Baird, Louise, Nicholas Evans, and Simon J. Greenhill. 2022. "Blowing in the Wind: Using 'North Wind and the Sun' Texts to Sample Phoneme Inventories." *Journal of the International Phonetic Association*, 52(3): 453–494.
- Bessell, Nicola Jane. 1992. Towards a Phonetic and Phonological Typology of Post-velar Articulation. PhD dissertation, The University of British Columbia.
- Bhaskararao, Peri and Peter Ladefoged. 1991. "Two Types of Voiceless Nasals." *Journal of the International Phonetic Association*, 21(2): 80–88.
- Bjorndahl, Christina. 2022. "Voicing and Frication at the Phonetics-phonology Interface: An Acoustic Study of Greek, Serbian, Russian, and English." *Journal of Phonetics*, 92: 101–136.
- Chelliah, Shobhana L. and Willem J. De Reuse. 2010. "What to Expect in Morphosyntactic Typology and Terminology." *Handbook of Descriptive Linguistic Fieldwork* (S. L. Chelliah and W. J. De Reuse, eds.), 279–356, Dordrecht: Springer Netherlands.
- Cho, Taehong and Peter Ladefoged. 1999. "Variation and Universals in VOT: Evidence from 18 Languages." *Journal of Phonetics*, 27(2): 207–229.
- Clayton, Ian. n.d. *Phonetics in Phonology: Evidence from Scottish Gaelic Preaspiration*. ms, University of North Carolina, Chapel Hill.
- Croft, William. 2022. *Morphosyntax: Constructions of the World's Languages*. Cambridge: Cambridge University Press.
- Gordon, Matthew K. 2016. *Phonological Typology*. Oxford: Oxford University Press.
- Gordon, Matthew K. 2017. "Phonetic and Phonological Research on Native American Languages: Past, Present, and Future." *International Journal of American Linguistics*, 83(1): 79–110.
- Ladefoged, Peter and Ian Maddieson. 1996. *The Sounds of the World's Languages*. Oxford: Blackwell Publishers.
- Maddieson, Ian. 2010. "Typology of Phonological Systems." *The Oxford Handbook of Linguistic Typology* (J. J. Song, ed.), 534–548, Oxford University Press.
- Maddieson, Ian. 2016. "Under-documented Languages Expand Phonetic Typology." *Journal of the Acoustical Society of America*, 139(4_Supplement): 2212–2212.
- McDonough, Joyce and Doug H. Whalen. 2008. "The Phonetics of Native North American Languages." *Journal of Phonetics*, 36(3): 423–426.

- Moran, Steven, Shelece Easterday and Eitan Grossman. 2023. "Current Research in Phonological Typology." *Linguistic Typology*, 27(2): 223–243.
- Nance, Claire and Sam Kirkham. 2022. "Phonetic Typology and Articulatory Constraints: The Realization of Secondary Articulations in Scottish Gaelic Rhotics." *Language*, 98(3): 419–460.
- Salesky, Elizabeth, Eleanor Chodroff, Tiago Pimentel, Matthew Wiesner, Ryan Cotterell, Alan W. Black, and Jason Eisner. 2020. "A Corpus for Large-scale Phonetic Typology (Version 1)".
- Shosted, Ryan K. 2006. *The Aeroacoustics of Nasalized Fricatives: An Instrumental Study in Phonetic Typology*. PhD dissertation. University of Illinois Urbana-Champaign.
- Um, Hye-Young. 1999. "Glottalized Sonorants in Gitksan." *Studies in Phonetics, Phonology and Morphology*, 5(2): 94–109.
- Whalen, Douglas H., Christian DiCano, and Rikker Dockum. 2022. "Phonetic Documentation in Three Collections: Topics and Evolution." *Journal of the International Phonetic Association*, 52(1): 95–121.