

**PERCEPTION OF FOUR-WAY LARYNGEAL
CONTRAST IN TWO-WAY CONTRAST
LANGUAGES**

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**DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
INDIAN INSTITUTE OF TECHNOLOGY DELHI**

JULY 2025

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LANGUAGES**

by

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DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

**Submitted in fulfilment of the requirements of the degree of
Doctor of Philosophy**

to the



INDIAN INSTITUTE OF TECHNOLOGY DELHI

JULY 2025

Certificate

This is to certify that the thesis **Perception of Four-way Laryngeal Contrast in Two-way Contrast Languages** submitted by **Krishan Chaursiya** (entry no. 2018HUZ8103) to the Department of Humanities and Social Sciences, Indian Institute of Technology, for the award of **Doctor of Philosophy** is a record of bona fide work carried out by him under my supervision. In my opinion, the thesis has reached the standards of fulfilling the requirements for submission relating to the degree. The contents of the thesis have not been submitted in part or full, to any other university or institute for the award of any other degree or diploma.

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Date: 23 July, 2025

Acknowledgements

I am indebted to the native speakers of Hindi, Malayalam and Meiteilon, both in Delhi and in the other states of India who participated in the experiments. The experiments' time horizon was long, and it needed constant participation from many people. I am grateful to all the participants who made the data collection possible. I also especially thank the two native Hindi informants who came to the recording setup and helped tirelessly with stimuli elicitation. Their genuine participation and subsequent natural data have greatly helped shape this thesis's content.

My sincere gratitude extends to my supervisor Prof. Paroma Sanyal for her guidance, seminars, reading groups, courses and encouragement in developing and executing research problems. Foremost, I am grateful to her for believing in me even when I was skeptical of my research caliber. I am also grateful for the intellectual freedom I was given to pursue my own line of inquiry, which allowed me to shape this work in a way that I find meaningful and satisfying. Her belief that “No analysis is a wrong analysis.” gave me freedom of thought to look at the same problem from multiple perspectives and form a more nuanced understanding of research problems. I have come a long way in shaping research caliber owing to this support.

I am immensely thankful for the guidance by my Research Committee members Prof. Sanil V., Prof. Ashwini Vaidya and Prof. Somdev Kar. Their support and insights shared during academic presentations, synopsis and other discussions have been instrumental in the progress of this thesis. I also thank all the faculty members and colleagues at IITD who knowingly or unknowingly helped me in my PhD journey. I am also especially grateful for the invaluable support by Prof. Amlesh Gope through

professional and casual discussions on the phonetic aspects of Tibeto-Burman languages. Those discussions have enriched my understanding of Meiteilon as a language and helped me design stimuli accordingly.

Special thanks are also due to my dear colleague Wasim Odud for his deep knowledge of R programming and statistical analysis. His counter arguments and drive for targeting objective truth have rendered objectivity to this thesis to a great degree. I would also like to thank Greeshma Joseph who was ready to answer my queries regarding Malayalam phonology and give intuitive acceptability judgements whenever needed. Both people have helped in this journey since the start, in both formal meetings and impromptu casual discussions. I am indebted to their unwavering support.

I also thank Therese Liam Tom, Padmabati Achom, and numerous other people whom I cannot recall, for helping me find participants for the experiments and accelerating the data collection process. I also extend my gratitude to my teachers at the University of Delhi, who first ignited the fire in me for pursuing linguistics. I am also deeply appreciative of the support and collaboration from Jeremy Zehr and Florian Schwarz whose PCIBex workshops and prompt answers to my queries greatly helped in setting up and running the experiments. Their kind and continuous support has been instrumental in the experiment implementation and hosting.

Next, I wish to acknowledge the friends, flatmates, and fellow researchers who always provided a comfortable resort after a long day at the research lab. I would like to thank Chandani, Sayantani, Apurva, Preeti, Vyom, Tanuj and Ankita for unwinding our academic pressure, frustration and challenges over a cup of tea and lunch. I am grateful

to the staff at the IIT HuSS office—Neelam Ma’am, Pankaj Sir, Mukesh, and others—for their support in facilitating a smooth administrative process during my PhD.

I lastly thank my family for their unconditional love and support. Bhawna (my friend and wife) has been a constant supporter in the lowest and highest points in my PhD journey. Her admiration, love and care have kept me motivated to forge forward in challenging environments. My mother, whose love knows no length, has been a warming abode amidst the chilly scares of the PhD journey. Even though they do not understand the technical aspects of my thesis, they have always shown keen interest in helping me in any way possible, at whatever chance they get. And for that I truly appreciate them.

Without the support of the people mentioned above, this thesis wouldn’t exist. All errors are my own.

Krishan Chaursiya

23 July, 2025

Abstract

This thesis presents a comprehensive investigation into the perception of laryngeal contrast in a second language scenario. It specifically focuses on how the speakers of two-way contrast languages, namely Meiteilon and Malayalam, perceive the four-way laryngeal contrast of Hindi, in word-initial onset, intervocalic onset and word-final coda positions. Hindi has a four-way laryngeal contrast (e.g. /p/, /b/, /p^h/, /b^h/) while Malayalam has two-way voicing (e.g. /p/, /b/) and Meiteilon has two-way aspiration (/p/, /p^h/) contrast. Further, while Hindi has the four-way contrast in word-initial onset, intervocalic onset and word-final coda positions, Meiteilon and Malayalam have context dependent phonological conditions that prohibit these contrasts from emerging freely. This thesis focuses on how the disparities of the laryngeal contrast and their context-dependent emergence across these languages are perceived in L2 in segment identification task.

Results show that L1 phonemic inventory directly affects L2 perceptual accuracy: Meiteilon speakers perceive the aspiration contrast more accurately than the voicing contrast and Malayalam speakers perceive the voicing contrast more accurately than the aspiration contrast, although the Malayalam speakers perceive even the voiced segments with lower-than-expected accuracy, revealing the relative non-nativity of both voicing and aspiration contrasts. Contrary to segmental identification accuracy, the featural accuracy shows that Meiteilon speakers can reliably recognize the [voice] feature. Apart from L1 influence, it is observed that universal biases such as left-edge-prominence emerge in L2 interlanguage grammar through higher weights of IDENT constraints, especially in prominent positions. The response time for both the language

groups is also negatively correlated with accuracy, indicating higher processing load during grammatical conflict. The major chunk of errors made by both the target language groups occur where the presence of a non-native feature destabilizes the perception of the native feature. To model these effects formally, I propose that a contrast maximizing constraint MAXIMIZE-LAR inhibits the faithful identification of available native contrasts. Further, it is proposed that relevant IDENT constraints are inactive when the perceiver is unsure of the input and thus does not know what to be faithful to. The source and nature of this constraint inactivity is different than the constraint inactivity already proposed in literature. Cumulatively, the fluctuating weights of markedness constraints, along with the activeness of IDENT constraints in segmental perception yield the interlanguage grammar of native Meiteilon and Malayalam learners of L2 Hindi.

सार

यह शोध प्रबंध दूसरी भाषा परिदृश्य में स्वरयंत्रीय विपरीतता की धारणा में एक व्यापक जांच प्रस्तुत करता है। यह विशेष रूप से इस बात पर ध्यान केंद्रित करता है कि दो-तरफ़ा विपरीतता की भाषाएं, जैसे कि मीतेइलन और मलयालम बोलने वाले, हिंदी के चार-तरफ़ा स्वरयंत्रीय विपरीतता को शब्द-प्रारंभिक आदि व्यंजन, शब्द-मध्य आदि व्यंजन और शब्द-अंतिम अंत्य व्यंजन स्थितियों में कैसे अनुभव करते हैं। हिंदी में चार-तरफ़ा स्वरयंत्रीय विपरीतता होती है (जैसे /p/, /b/, /p^h/, /b^h/) जबकि मलयालम में दो-तरफ़ा ध्वन्यात्मकता (जैसे /p/, /b/) और मीतेइलन में दो-तरफ़ा प्रबलन (/p/, /p^h/) विपरीतता होती है। इसके अलावा, हिंदी में शब्द-प्रारंभिक शुरुआत, अंतर-स्वर शुरुआत और शब्द-अंतिम कोडा स्थितियों में चार-तरफ़ा विपरीतता होती है, जबकि मीतेइलन और मलयालम में संदर्भ पर निर्भर ध्वन्यात्मक स्थितियाँ होती हैं जो इन विपरीतताओं को स्वतंत्रता से उभरने से रोकती हैं। यह थीसिस इस बात पर केंद्रित है कि इन भाषाओं में स्वरयंत्र की विपरीतता और उनके संदर्भ पर निर्भर उद्भव की असमानताओं को द्वितीय भाषा में खंड पहचान कार्य में कैसे अनुभव किया जाता है।

परिणाम दिखाते हैं कि मातृभाषा ध्वन्यात्मक सूची सीधे द्वितीय भाषा अवधारणात्मक सटीकता को प्रभावित करती है: मेइतेइलॉन बोलने वाले ध्वन्यात्मकता की विपरीतता की तुलना में प्रबलन की विपरीतता को अधिक सटीक रूप से समझते हैं और मलयालम बोलने वाले ध्वन्यात्मकता की विपरीतता को प्रबलन की विपरीतता की तुलना में अधिक सटीक रूप से समझते हैं, हालांकि मलयालम बोलने वाले ध्वन्यात्मकता को भी अपेक्षा से कम सटीकता के साथ समझते हैं, जिससे उनमें ध्वन्यात्मकता और प्रबलन, दोनों की विपरीतता की गैर-जन्मजातता का पता चलता है। वाक् ध्वनि पहचान सटीकता के विपरीत, ध्वन्यात्मक लक्षण सटीकता से पता चलता है कि

मीतेइलन बोलने वाले [voice] ध्वन्यात्मक लक्षण को विश्वसनीय रूप से पहचान सकते हैं। मातृभाषा प्रभाव के अलावा, यह देखा गया है कि बाएं किनारे की प्रमुखता जैसे सार्वभौमिक पूर्वाग्रह द्वितीय भाषा अंतरभाषा व्याकरण में IDENT बाधाओं के उच्च भार के माध्यम से उभरते हैं। दोनों भाषा समूहों की प्रतिक्रिया समय सटीकता के साथ नकारात्मक रूप से सहसंबद्ध है, जो व्याकरणिक संघर्ष के दौरान अधिक संज्ञानात्मक प्रसंस्करण भार को इंगित करता है। दोनों लक्ष्य भाषा समूहों द्वारा की गई त्रुटियों का बड़ा हिस्सा तब होता है जब किसी गैर-देशी विशेषता की उपस्थिति मूल विशेषता की धारणा को अस्थिर कर देती है। इन प्रभावों को औपचारिक रूप से मॉडल करने के लिए, मैं प्रस्ताव करता हूं कि एक विपरीतता अधिकतम करने वाला प्रतिबंध MAXIMIZE-LAR उपलब्ध मूल विरोधाभासों की विश्वसनीय पहचान को बाधित करता है। इसके अलावा, यह प्रस्तावित है कि प्रासंगिक IDENT बाधाएं तब निष्क्रिय होते हैं जब बोधक प्रविष्टि के बारे में अनिश्चित होता है और इस प्रकार यह नहीं जानता कि किस पर विश्वास करना है। इस बाधा की निष्क्रियता का स्रोत और प्रकृति साहित्य में पहले से प्रस्तावित बाधा निष्क्रियता से भिन्न है। संचयी रूप से, खंडीय धारणा में पहचान प्रतिबंधों की सक्रियता के साथ-साथ चिह्नितता प्रतिबंधों के उतार-चढ़ाव वाले भार, द्वितीय भाषा हिंदी के मूल मीतेइलन और मलयालम सीखने वालों के अंतरभाषा व्याकरण को जन्म देते हैं।

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List of Abbreviations

4-AFC	4-Alternative Forced Choice
CAH	Contrastive Analysis Hypothesis
CDA	Constraint Demotion Algorithm
CON	Constraint
EVAL	Evaluator
F	Faithfulness
FUL	Featurally Underspecified Lexicon
GEN	Generator
GLA	Gradual Learning Algorithm
HG	Harmonic Grammar
IA	Indo-Aryan
L1	First Language
L2	Second Language
LCC	Local Conjoined Constraint
M	Markedness
MDH	Markedness Differential Hypothesis
MT	Motor Theory
OCP	Obligatory Contour Principle
OT	Optimality Theory
PAM	Perceptual Assimilation Model
PAM-L2	Perceptual Assimilation Model-Second Language
Poa	Place of Articulation
RT	Response Time
SLA	Second Language Acquisition
SP	Subset Principle
SPE	Sound Pattern of English
SR	Surface Representation
SSP	Sonority Sequencing Principle
UG	Universal Grammar
UPSID	UCLA Phonological Segment Inventory Database
UR	Underlying Representation
VOT	Voice Onset Time

Gloss (following Leipzig Rules)

NEG	Negation
NMLZ	Nominalizer
Q	question