

Dear EOM committee,

I am Koorosh Ariyae, a PhD candidate (ABD), at the Department of Linguistics of the University of Toronto. The 2023-2024 academic year will be the sixth year of my PhD program, and currently I am writing my PhD dissertation. Thus, I am writing to be considered for the EOM Dissertation Completion Fellowship.

Since I started my graduate studies at U of T's Department of Linguistics as an MA student, I have been working on Iranian languages. My Master's thesis project investigated vowels and nasal consonants in Tehrani variety of Persian. My research on Iranian languages expanded after I was admitted into the PhD program of the Department of Linguistics. For instance, during the past few years, I have been collecting data via experimental methods to describe and document the understudied aspects of the sound inventory of Kurdish, a Northwestern Iranian language. Furthermore, my first and second General papers have been, respectively, dedicated to the study of vowels and consonants in Persian. During the process of conducting these studies, with the purpose of documenting empirically reliable data, I collected a considerable amount of Spoken Persian data via online and lab-based methods. Throughout my graduate studies, I have been actively presenting and publishing the results of my research at prestigious conferences and publications highlighting the lesser-known and underrepresented properties of Iranian languages (please see my CV attached to this letter for a complete list of my presentations and publications).

I am currently at the stage of writing my PhD dissertation which investigates how Persian speakers comprehend and process Persian sounds in daily speech. To address this question, I conduct a series of experiments on Persian speaking participants. The results of these experiments help to have a better understanding how human cognitive system comprehends and processes sounds, and what factors are at play that facilitate or impede the comprehension procedure.

I plan to complete my dissertation in the coming year which requires a substantial amount of work. The EOM Dissertation Completion Fellowship will be a major support and will provide me this opportunity to complete my dissertation in a timely manner. So, I will be grateful if my application is considered for this award.

Sincerely,  
Koorosh Ariyae

# Koorosh Ariyae

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## Curriculum Vitae

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## Education

- 2018 – **Ph.D. of Linguistics**, *University of Toronto*, Toronto, Canada.  
*Dissertation*: Positional effects on the mental representation of reduced word forms in Persian  
*Committee*: Philip Monahan (co-supervisor), Jessamyn Schertz (co-supervisor), Alexei Kochetov
- 2018 **M.A. of Linguistics**, *University of Toronto*, Toronto, Canada.
- 2013 **M.A. of English Literature**, *Kharazmi University*, Tehran, Iran.
- 2011 **B.A. of English**, *Razi University*, Kermanshah, Iran.

## Other Education

- 2017 **Summer Institute, Linguistic Society of America**, *University of Kentucky*, Lexington, USA.

## Research Interests

Phonetics  
Phonology  
Psycholinguistics  
Iranian languages

## Publications

- In press **Ariyae, Koorosh**. Triggers and targets: Nasals and vowels in Tehrani Persian. Invited contribution to *The Handbook of Persian Dialects and Dialectology*, eds. A. Korangy, B. Mahmoodi-Bakhtiari & P. Shabani-Jadidi. Springer.
- Accepted **Ariyae, Koorosh**. Persian vowel hiatus. In *The Handbook of Phonetics and Phonology of Modern Iranian Languages*, eds. R. Falahati & Z. Ghane. Springer.
- 2021 **Ariyae, Koorosh** & Alexei Kochetov. Acoustics of Persian uvular lenition in consonant clusters. *Proceedings of the annual meeting of the 39th Canadian Linguistics Association*.

- 2021 **Ariyae, Koorosh**, Chahla Ben-Ammar, Talia Tahtadjian, Alexei Kochetov. Acoustics of guttural fricatives in three languages. *Proceedings of Acoustics Week in Canada*.
- 2021 **Ariyae, Koorosh** & Peter Jurgec. Variable hiatus in Persian is affected by suffix length. *Proceedings of the 2020 Annual Meeting on Phonology*, eds. R. Bennett, R. Bibbs, M. L Brinkerhoff, M J. Kaplan, S. Rich, N. Van Handel & M. W. Cavallaro. Washington, DC: Linguistic Society of America.
- 2019 **Ariyae, Koorosh**. The need for indexed markedness: evidence from spoken Persian. *Proceedings of the annual meeting of the 37th Canadian Linguistics Association*.
- 2019 **Ariyae, Koorosh**. Loanword adaption in Persian; A Core-Periphery model approach. *Toronto Working Papers in Linguistics 41: Proceedings of Montreal-Ottawa-Toronto Phonology/Phonetics Workshop 2019*.

## Manuscripts (in progress)

- Journal paper (under review) **Ariyae, Koorosh**, Chahla Ben-Ammar, Talia Tahtadjian, Alexei Kochetov. Acoustics of guttural fricatives in Arabic, Armenian, and Kurdish: A case in remote data collection.
- Journal paper (under review) **Ariyae, Koorosh** & Peter Jurgec. Hiatus in Persian: How morphology creates phonological asymmetries in language.
- Working paper (under review) **Ariyae, Koorosh**. Nominal linkers in Persian. In *Nominal Linkers in Iranian languages*, eds. S. Taghipour & A. Kahnemuyipour. *Toronto Working Papers in Linguistics*.

## Invited Talks

- 2021 Tolerance and resolution of hiatus in Persian. June 21. Razi University, Kermanshah, Iran.
- 2021 Socioculturally induced language barrier: Stigmas and resolution strategies. Invited speaker series workshop on language barrier at *Youth 4 Success Organization*. February 27. Toronto, Canada.

## Conferences

### *Peer-reviewed Conference Presentations*

- 2023 **Ariyae, Koorosh**, Chahla Ben-Ammar, Talia Tahtadjian, Alexei Kochetov. An acoustic analysis of guttural fricatives in Arabic, Armenian, and Kurdish. Oral presentation at *The Third North American Conference in Iranian Linguistics (NACIL 3)*. April 21-23. UCLA.
- 2022 **Ariyae, Koorosh**, Chahla Ben-Ammar, Talia Tahtadjian, Alexei Kochetov. Acoustic classification of guttural fricatives in Arabic, Armenian, and Kurdish. Oral presentation at *The 18th Conference on Laboratory Phonology (LabPhon 18)*. June 23-25.

- 2021 **Ariyae, Koorosh**, Chahla Ben-Ammar, Talia Tahtadjian, Alexei Kochetov. Acoustics of guttural fricatives in three languages. Oral presentation at *Acoustics Week in Canada (AWC 21)*. October 5-7. Université de Sherbrooke.
- 2021 **Ariyae, Koorosh** & Alexei Kochetov. Acoustics of Persian uvular lenition. Oral presentation at *Canadian Linguistics Association (CLA 39)*. June 5-7. University of Alberta.
- 2020 **Ariyae, Koorosh** & Peter Jurgec. Variable hiatus in Persian. Flash Talk at *North East Linguistic Society (NELS 51)*. November 6-8. Université du Québec à Montréal.
- 2020 **Ariyae, Koorosh** & Peter Jurgec. Variable hiatus in Persian is affected by suffix length. Oral presentation at the *Annual Meeting on Phonology (AMP 8)*. September 18-20. University of California at Santa Cruz.
- 2020 **Ariyae, Koorosh** & Peter Jurgec. Persian elides the second vowel. Oral presentation at *Canadian Linguistics Association (CLA 38)*. May 30-June 1. Western University.
- 2019 **Ariyae, Koorosh**. The need for indexed markedness: evidence from spoken Persian. Oral presentation at *Canadian Linguistics Association (CLA 37)*. June 1-3. University of British Columbia.
- 2019 **Ariyae, Koorosh** & Ali Salehi. Does Persian prefer Arabic to French and English? Poster presentation at *Canadian Linguistics Association (CLA 37)*. June 1-3. University of British Columbia.
- 2019 **Ariyae, Koorosh**. Loanword adaption in Persian; a Core-Periphery model approach. Oral presentation at *Montreal-Ottawa-Toronto Phonology/Phonetics (MOT) Workshop*. March 29-30. University of Toronto.
- 2019 **Ariyae, Koorosh**. Exceptions of pre-nasal vowel raising in spoken Persian; an indexed constraint approach. Oral presentation at *North American Conference in Iranian Linguistics (NACIL 2)*. April 19-21. University of Arizona (virtually).
- 2017 **Ariyae, Koorosh**. Imperative marking in Southern Kurdish. Poster presentation at *Linguistics Summer Institute of America (LSA)*. August 8. University of Kentucky.
- 2017 **Ariyae, Koorosh**. Morphological tense marking operations in Kalhori Kurdish. Oral presentation at *Southeastern Conference on Linguistics (SECOL 84)*. March 8-11. College of Charleston.

### ***Non-refereed Conference Presentations***

- 2021 **Ariyae, Koorosh**, Chahla Ben-Ammar, Talia Tahtadjian, Alexei Kochetov. Acoustics of guttural fricatives in three languages. Oral presentation at *Summer Phonology Forum 2021 (SPF 2021)*. July 27. University of Toronto.
- 2019 **Ariyae, Koorosh**. Hiatus resolution strategies in Persian. Oral presentation at *Summer Phonology Forum 2019 (SPF 2019)*. August 2. University of Toronto.

- 2018 **Ariyae, Koorosh.** Loanword adaptation patterns in Persian. Oral presentation at *Iranian Languages Workshop*. December 5. University of Toronto.
- 2018 **Ariyae, Koorosh.** Pre-nasal vowel Raising in vernacular Tehrani Persian. Oral presentation at *Summer Phonology Forum 2018 (SPF 2018)*. August 2. University of Toronto.
- 2017 **Ariyae, Koorosh.** Copular constructions in Malagasy. Oral presentation at *Malagasy Workshop*. December 11. University of Toronto.
- 2017 **Ariyae, Koorosh.** Concatenative and nonconcatenative morphology in tense-marking. Oral presentation at *Central Kentucky Linguistics Conference (CKLiC)*. February 18. University of Kentucky.

## --- **Research Assistantships**

- 2020 & 2021 West Asian Uvular Project. PI: Alexei Kochetov. University of Toronto.
- 2018 & 2019 LinDoc Project. PI: Keren Rice, Suzi Lima. University of Toronto.

## --- **Scholarships & Awards**

### ***Scholarships***

- 2023 – 2024 Ontario Graduate Scholarship. \$15,000.
- 2023 B. Elan Drescher Graduate Scholarship in Linguistics. *University of Toronto*. \$3,000.

### ***Grants & Awards***

- 2019 – 2023 SSHRC Institutional Grant (SIG) Program/Departmental research funds. *University of Toronto*. \$500/year.
- 2019 Canadian Linguistics Association (CLA) conference travel grant, \$400.
- 2011 Distinguished Student Award. *Razi University*, Iran.
- 2008 & 2009 Distinguished Student Award. *Razi University*, Iran.

## --- **Teaching**

### ***Course Instructor: University of Toronto***

- Summer 2023 Phonetics (LIN228).

*Responsibilities:* Preparing and delivering lectures; creating quizzes, exams, assignments and discussion activities in class; holding office hours and meetings with students; preparing weekly tutorial materials, and supervising TAs of the course.

### ***Teaching Assistant: University of Toronto***

*Responsibilities:* Delivering weekly in-person/online tutorials; running help labs; grading, creating assignments & exams; weekly meetings with the course instructor & other TAs; exam invigilation.

- Summer 2022 Introduction to Linguistics (LINA01).

Winter 2022 Introduction to Linguistics: The Sounds of Language (LIN101).  
 Fall 2021 Phonetics (LIN228).  
 Summer 2021 Phonetics (LIN228).  
 Summer 2021 Introduction to Linguistics (LINA01).  
 Winter 2021 Phonology I (LINB04).  
 Fall 2020 Phonetics (LINB09).  
 Summer 2020 Phonetics (LIN228).  
 Summer 2020 Introduction to Linguistics (LINA01).  
 Winter 2020 Introduction to Linguistics: Sentence Structure (LIN102).  
 Fall 2019 Introduction to Linguistics: Sound Structure (LIN101).  
 Summer 2019 Introduction to Linguistics (LINA01).  
 Winter 2019 Introduction to Linguistics: Sentence Structure (LIN102).  
 Fall 2018 Introduction to Linguistics: Sound Structure (LIN101).  
 Winter 2018 English Grammar (LIN204).  
 Fall 2017 Introduction to Language (LIN200).

### ***Grader at University of Toronto***

2020 & 2022 Phonological Theory (LIN322).  
 2019 Introduction to Linguistics: Sound Structure (LIN101).

### ***Other Instructor Experiences***

2011 – 2015 English as a foreign language. *Iran Language Institute (ILI)*, Iran.

## **Editorial and Review**

2023 Reviewer: Third North American Conference in Iranian Linguistics (NACIL 3).  
 2020 – Reviewer: Toronto Working Papers in Linguistics.  
 2020 Reviewer: Sixth Workshop on Turkic and Languages in Contact with Turkic (TU+6).

## **Services**

### ***Departmental Services at University of Toronto***

2022 – 2023 Graduate student representative, Phonology Job Search Committee.  
 2021 – 2023 Coordinator of Phonetics and Phonology Research Group.  
 2017 – 2022 Teaching Assistant Excellence Award Committee member.  
 2018 – 2020 Welcome Workshop Committee member.

### ***Organizing Conferences***

2017 **Local Organizing Committee**, The 24th International Conference on Head driven Phrase Structure Grammar (HPSG 24th), University of Kentucky.

2017 **Local Organizing Committee**, The 5th International Conference on Formal Approaches in Creole Studies (FACS 5th), University of Kentucky.

### ***Volunteer***

2019 Montreal-Ottawa-Toronto Phonology/Phonetics (MOT) Workshop. University of Toronto.

2018 Semantics of Under-Represented Languages in the Americas (SULA 10) Conference. University of Toronto.

2018 Morphology in Montreal-Ottawa-Toronto workshop (MoMOT 3). University of Toronto. University of Toronto.

2017 Malagasy Workshop. University of Toronto.

Summer 2017 Linguistic Summer Institute of America. June–July. University of Kentucky.

## ———— **Languages**

Persian Native

Kurdish Native

English Fluent

Arabic Basic reading knowledge

## ———— **Memberships**

2022 – Association for Laboratory Phonology (LabPhon)

2017 – Canadian Linguistic Association (CLA)

2021 – 2022 Canadian Acoustical Association (CAA)

2017 – 2019 Linguistic Society of America (LSA)

2017 – 2018 Southeastern Conference on Linguistics (SECOL)

## ———— **Skills**

Speech analysis: Praat

Experiments: Gorilla

Programming: R

Text: L<sup>A</sup>T<sub>E</sub>X

Office: Excel, PowerPoint, Word

## PhD Dissertation synopsis and completion timeline

### Koorosh Ariyae

**Introduction:** Canonical pronunciations of words are not always used in daily speech (Johnson, 2004). Instead, speakers frequently use non-canonical word forms (e.g., county → couny in American English). The existence of such non-canonical variants has led to a fundamental question in the field of human speech comprehension: Does the brain store different pronunciation variants of a word in the long-term memory? Previous studies (e.g. Chomsky & Halle, 1968) proposing a *single-storage* system for the mental lexicon suggest that only the canonical variant of a word is stored. Yet, more recent findings (e.g. Ranbom & Connine, 2007) arguing for a *multiple-storage* system show that canonical *and* non-canonical variants are both stored. However, most studies supporting a *multiple-storage* system examine data in which the non-canonical variant (e.g., couny) is considerably more frequent than its canonical counterpart (e.g., county) (Bürki et al., 2010; Bürki & Gaskell, 2012). This might pose challenges for the *multiple-storage* system's predictions because some of the proponents of the *single-storage* system (e.g. Levelt, 1989) posit that while the mental lexicon stores the canonical variant only, it can exceptionally allow the storage of non-canonical forms that are overwhelmingly more frequent than their canonical counterparts.

In my PhD dissertation I aim to test the reliability of the *multiple-storage* system's predictions by examining words in which the non-canonical variant is *less* frequent than its canonical form. To do so, I examine Persian words that contain the uvular consonant (a sound produced when back of the tongue touches the uvula). This sound's canonical variant is produced with complete constriction of articulators (such as /k/ in kit), and its non-canonical form has less constriction (such as /w/ in wit) (Ariyae, 2021; Reza Asa, 2016). The uvular sound in Persian can occur in initial, medial, and final positions of words. Across these positions, the non-canonical variant is always the less frequent form with different degrees of frequency: word-medially it is almost as frequent as the canonical form; word-finally it is considerably the less frequent variant; and word-initially it is overwhelmingly less frequent than the canonical form (Ariyae, 2021). This nuanced frequency pattern of the non-canonical variant provides an excellent test case for the predictability of the *multiple-storage* system.

**My dissertation:** Previous studies (e.g. Sumner & Samuel, 2009) show that the mental lexicon stores frequencies of a words' variants. Crucially, a variant's frequency determines the time it takes to access that variant in the mental lexicon. Hence, more frequent variants are processed faster than less frequent ones. To have evidence for the storage of a word's canonical *and* non-canonical variants, there should be an inverse interaction between the frequency and processing time of each variant. To investigate this interaction, I conducted two experiments. First, to measure the variants' frequency, I ran a rating experiment in which participants rated the acceptability of variants on a scale of 1 (i.e., infrequent) to 10 (i.e., highly frequent). Second, in a lexical decision experiment I measured how long it took for participants to confirm the variant they heard was a real word. Results revealed an inverse relationship between frequency and processing time of each word's variants. These results could confirm that highly infrequent, non-canonical variants can also be stored. To further support these findings, I plan to conduct a form priming experiment (Gaskell & Marslen-Wilson, 1996; Sumner & Samuel, 2005). In this type of experiment to test the storage status of a word's non-canonical variant, participants hear a series of prime-target pairs.



They hear the prime quickly followed by the target and are asked to decide whether the target is a real word (Gor, 2018). Participants hear different prime-target conditions: i) *related condition* where the prime is the non-canonical variant and the target is the canonical variant of the same word (e.g., counny-county), ii) *unrelated condition* where the prime and target are totally different words (e.g., pillow-county). If the prime is stored, responses to the target in the *related condition* will be faster compared to the *unrelated condition* (Ranbom & Connine, 2007). To make sure that the priming effect is not tied to a sound overlap between the prime and the target, a third condition will be included, where the prime-target pair have sound overlaps (e.g., bounty-county). If the priming effect obtained in the *related condition* is not tied to sound overlaps, in the third condition there should be no or a weaker priming effect compared to the *related condition*. Obtaining such results will provide further evidence for the storage of infrequent, non-canonical forms.

**Contribution:** This research will have theoretical contributions to models of speech comprehension and will provide insights about the underlying system of human language cognition. It will also have practical contributions to foreign language learning, automatic speech recognition, and speech/language pathology.

#### Dissertation completion timeline

Timeline	Chapters
Fall 2023	Chapters 2 & 3
Winter 2024	Chapters 4 & 5
Summer 2024	Chapter 1
Fall 2024	Dissertation defense

#### Selected references

- Ariyae, K. (2021). Acoustics of Persian uvular lenition. Unpublished General Paper. University of Toronto.
- Bürki, A., Ernestus, M., & Frauenfelder, U. H. (2010). Is there only one “fenêtre” in the production lexicon? *Journal of Memory and Language*, 62(4), 421–437.
- Chomsky, N., & Halle, M. (1968). *The sound pattern of English*. Harper and Row.
- Gaskell, M. G., & Marslen-Wilson, W. D. (1996). Phonological variation and inference in lexical access. *Journal of Experimental Psychology*, 22(1), 144-158.
- Gor, K. (2018). Phonological priming and the role of phonology in nonnative word recognition. *Bilingualism: Language and Cognition*, 21(3), 437-442.
- Johnson, K. (2004). Massive reduction in conversational American English. *Spontaneous Speech: Data and Analysis. Proceedings of the 10th International Symposium*, 29–54.
- Levelt, W. J. M. (1989). *Speaking: From intention to articulation*. Cambridge, MA: MIT Press.
- Ranbom, L. J., & Connine, C. M. (2007). Lexical representation of phonological variation in spoken word recognition. *Journal of Memory and Language*, 57(2), 273-298.
- Sumner, M., & Samuel, A. G. (2009). The effect of experience on the perception and representation of dialect variants. *Journal of memory and language*, 60(4), 487-501.