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## HELIX: A BILINGUAL ILLUSTRATED DICTIONARY FOR GREEK HERITAGE LEARNERS

**Abstract** The recent development of the *Curriculum for Teaching Greek as a Heritage Language: A Framework for Teachers* (Gavriilidou & Mitsiaki, 2022) underscored the need for a dictionary to serve as supplementary material during the curriculum's implementation at Greek Community schools in the USA. This presentation aims to introduce the Greek Heritage Language Learners' Illustrated Lexicon (Helix), an online, bilingual, illustrated dictionary designed for Greek Heritage Learners aged 5-10 years living in USA, Canada, Australia, etc. Helix is intended to enhance the teaching resources available to educators who teach Greek as a heritage language. It provides word definitions based on the linguistic competence of heritage speakers of Greek, facilitating efficient vocabulary acquisition and the development of students' language skills. Specifically, it aims to serve as the primary dictionary for Greek Heritage students, whether used in the classroom or outside, to practice their reading, writing, speaking, and listening skills.

**Keywords** Greek heritage speakers; heritage learners; dictionary making; pedagogical lexicography; lexicographic protocol

### 1. Introduction

A heritage language speaker (HS) is an early bilingual who typically acquires their parents' language at home. A typical HS profile includes a child growing up in a family where the home language differs from the host country's language. However, as an HS grows and attends school, proficiency in the majority language often overshadows the heritage language, limiting its use within the ethnolinguistic community or at home. Despite the home language being used by parents or caretakers, many young HSs prefer to communicate in the dominant language (Polinsky & Kagan, 2007; Gavriilidou & Mitits, 2021).

This linguistic shift leads to significant vocabulary gaps, hindering comprehension and expression in the heritage language, both written and oral (Gavriilidou & Mitits, 2021). Additionally, when the alphabet is non-Latin, as in the case of Chinese, Korean, and Greek heritage speakers (HSs) in USA or Canada who initially became literate using the Latin alphabet but must also learn a non-Latin alphabet (such as Greek in our case) to become literate in their heritage language, reading and writing become more challenging (Polinsky & Kagan, 2007).

Most research on heritage languages has focused on speakers whose home languages are Spanish, Chinese, Russian, and Polish (see Carreira & Kagan, 2011). Greek Heritage Speakers (GHSs) have only recently become a subject of study (Gavriilidou & Mitits, 2019; 2021). The Greek Heritage Language Corpus (GHLC) (Gavriilidou et

al., 2019), developed as part of the project “Varieties of Greek as a Heritage Language: Creation of a Corpus and Comparative Study” (MIS 5006199, Scientific Coordinator Professor Zoe Gavriilidou), is the first spoken corpus of Greek as a heritage language. It includes data from first, second, and third-generation Greek heritage speakers living in Chicago, Moscow, and Saint Petersburg. The GHLC has been instrumental in profiling this group of heritage speakers. Its collection and compilation aim to:

- Improve theories of heritage language acquisition, focusing on lexical, morphosyntactic, and pragmatic features of Greek heritage language varieties.
- Contribute to the design of needs-analysis based tools and educational resources and materials, such as the Helix dictionary, and to the selection and structuring of teaching content (syllabi design), vocabulary teaching (false cognates, blends, etc.), and grammar teaching (prioritization of grammatical structures based on heritage learner needs).

The content of the GHLC reflects its purpose and significantly supports research in Heritage Greek.

Teaching heritage languages is widely recognized as highly important today. Heritage speakers (HSs) typically share a common profile but vary significantly in their receptive and productive command of the heritage language (Benmamoun et al., 2013). Teaching heritage learners (HLs) is challenging due to their distinct educational needs (Gavriilidou et al., 2023). Teachers must engage students by selecting topics with practical significance to prevent them from disengaging from the learning process or failing to regain proficiency in the home language (Wiley, 2008).

To address these challenges, the new *Curriculum for Teaching Greek as a Heritage Language: A Framework for Teachers* (Gavriilidou & Mitsiaki, 2022), compiled to be used in Greek Community daily or Saturday Schools in the US, employs both macro- and micro-level approaches aligned with the principles of the American Council on the Teaching of Foreign Languages (ACTFL). The curriculum strategically integrates dictionary activities as part of a spiral approach, enhancing vocabulary acquisition and fostering overall language growth across various competence levels for heritage language learners. However, this curriculum needs to be complemented with reference tools such as dictionaries and lesson plans to ensure successful classroom implementation. This is precisely the purpose behind creating Helix.

## 2. Dictionary Use

Research on dictionary use and its impact on language skills and vocabulary learning has long engaged scholars and remains a significant area of interest. The results of the research highlight the importance of using dictionaries during the learning process, both in terms of comprehension (Wingate, 2002; Shieh & Freiermuth, 2010; Shen, 2013, Hamdi, 2015) and production (Chun, 2004; Elola et al., 2008; Wolfer et al., 2016), as well as in vocabulary learning (Chen, 2011; Ma & Cheon, 2018). Consequently, on one hand,

the use of dictionaries should be part of the educational process and integrated into it, and on the other hand, students should be effective dictionary users (Chadjipapa et al., 2020). This necessitates training students in dictionary use, which can be achieved through explicit instruction in dictionary use strategies (Gavriilidou et al., 2024). The prerequisite for all this is the existence of appropriate and well-designed dictionaries that meet the specific learning conditions and needs of the users (Tono, 2001).

Recognizing the pedagogical benefits of dictionary use in vocabulary learning and on reading and writing, the curriculum strategically integrates dictionary activities as part of a spiral approach, enhancing vocabulary acquisition and fostering overall language growth across various competence levels for heritage language learners.

The creation of the Greek Heritage Language Learners' Illustrated Lexicon (Helix) is an essential complement to the new curriculum. Helix innovates in several aspects:

- **Grounded in the Needs of Specific Learners:** It is tailored to meet the unique requirements of Greek Heritage Language learners.
- **Curriculum Integration:** It is the first dictionary designed specifically to support the new *Curriculum for Teaching Greek as a Heritage Language* in the USA.
- **Pedagogical Focus:** This dictionary addresses the educational needs of both heritage learners and teachers.
- **Illustrated and Interactive:** By providing images and animations, it assists heritage learners who may struggle with reading in their home language.
- **Accessible and User-Friendly:** Helix is an electronic dictionary freely accessible on the Internet, prioritizing flexibility and ease of use.

### 3. Helix: Steps and Design Principles

Helix is an online, bilingual, illustrated dictionary designed for Greek Heritage Learners aged 5–10 years. It encompasses the proposed vocabulary outlined in the syllabi for Kindergarten (Pre-K) and Novice (K1-K3) levels included in the *Curriculum for Teaching Greek as a Heritage Language: A Framework for Teachers*. Due to the language variance that a heritage speaker (HS) can demonstrate (Polinsky, 2015), vocabulary from earlier stages (Pre-K1) was also included in the dictionary. This inclusion ensures comprehensive coverage and addresses the diverse linguistic proficiencies of heritage learners.

In order to ensure a transparent and reproducible process of its compilation (Gavriilidou & Garoufos, 2022), Helix adopts the six phases of the lexicographic protocol proposed in Klosa (2013), for the creation of electronic dictionaries:

1. **The phase of preparation:** The preparation phase encompasses essential lexicographical processing and research necessary for crafting a dictionary.

It's a pivotal stage where crucial decisions are made regarding the dictionary's requirements, workflow, time allocation for completion, and cost estimation. Throughout this process, careful consideration is given to factors such as the type of dictionary, its intended users, size, and structure (Schierholz, 2015). In this phase, it was decided that, based on the language criterion, Helix would be bilingual (Greek-English) dictionary. Its coverage would be specialized addressing the needs of a specific audience; It is a school dictionary for Greek Heritage Speakers. Finally, it was decided to have a small size (see macrostructure below) and to be organized in three different ways (see below).

2. The phase of data acquisition: This phase follows the completion and finalization of the dictionary preparation phase and encompasses the data collection process (see 3.1 below).
3. The phase of computerization: The text collection process was followed by the phase of digitization, which involved organizing the content into files suitable for processing (.txt) by text analysis software.
4. The data processing phase: During this stage, we determine the final list of lemmas to be included in the dictionary.
5. The phase of data analysis: The data analysis phase is a pivotal stage in which the macrostructure and microstructure of the dictionary, along with any other pertinent information related to the lemma entries, are thoroughly examined and elucidated and
6. The phase of preparation for online release: Helix was designed and implemented as a web application.

### 3.1 Macrostructure

To determine Helix's macrostructure, we relied on several key elements:

a) Curriculum Vocabulary: The vocabulary suggested by the new *Curriculum for Teaching Greek as a Heritage Language* for each thematic unit in the syllabi for PreK and K1-3 was a primary source. This alignment ensures that Helix supports and enhances the curriculum's implementation.

b) Specially Compiled Corpus: A dedicated corpus, consisting of age-appropriate texts, was specifically compiled for this dictionary. This corpus includes texts from the databank of the syllabi of the official exams from the Centre for the Greek Language (CGL) for the certification of Greek language proficiency concerning level A1 (period 2000–2007). It provided a realistic and relevant lexical database tailored to the needs of young Greek heritage learners.

c) Reference to Similar Dictionaries: The headword lists from similar illustrated dictionaries in other languages, such as the Wordsmyth Illustrated Learner's

Dictionary (WILD), were consulted. This comparative analysis helped to refine the selection of headwords, ensuring that Helix meets high pedagogical standards and offers a robust learning tool.

Initially, we began with a selection of 700 lemmas based on the vocabulary outlined in the new *Curriculum for Teaching Greek as a Heritage Language: A Framework for Teachers*. This curriculum served as our primary guide for determining which words to include in Helix.

Following this initial selection, we organized the lemmas into categories based on word families to ensure a structured and cohesive approach to vocabulary presentation. However, the process didn't stop there.

Further refinement of the lemmas was achieved through the analysis of a corpus specific to this project and by consulting similar dictionaries. The corpus analysis provided insights into the frequency and usage patterns of certain lemmas, helping us to prioritize and adjust our selection.

In some cases, the corpus analysis revealed that certain lemmas were highly frequent in usage but were not included in the main proposed vocabulary. Additionally, these lemmas were found to be relevant to thematic fields covered in higher educational levels.

For example, the word “ψωμί” (‘bread’) was not initially included in the proposed vocabulary for PreK or K1-K3 educational levels. However, through corpus analysis, it was discovered that this word had high frequency and relevance, particularly in Intermediate Low K4 & K5 levels. Students might encounter and use this word naturally during the proposed activities outlined in the syllabus.

Therefore, we made the decision to include such lemmas in the macrostructure of Helix. This ensures that the dictionary not only aligns with the proposed vocabulary but also anticipates and accommodates the evolving linguistic needs of heritage language learners across different educational levels.

Through this procedure, we meticulously refined our selection, resulting in a comprehensive list of 1500 lemmas.

The dictionary entries are arranged in three different ways according to:

- a) the alphabetic order of the entries;
- b) the thematic field that they belong. Thus, the entries can be searched and found according to word families (animal, people, months, plants, etc.);
- c) to the part of speech (noun, verb, adjective).

The environment of Helix can switch from English to Greek.

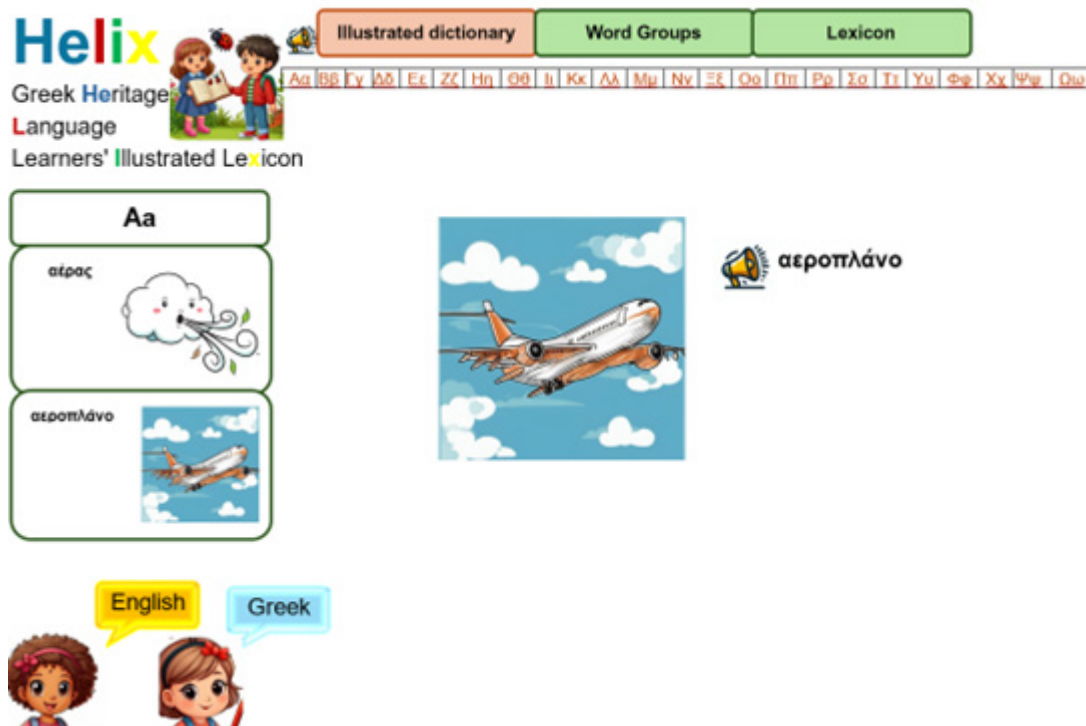


Fig. 1: Helix, Alphabetical order

The word families/groups that lemmas have been categorized and can be found in the field “Word Groups” are:

- animals (mammals, birds, fish, insects, reptiles and amphibians, young animals and animal parts);
- plants (flowers, trees, parts of a plant, tree parts);
- people (body, feelings, description, nationality, family members, professions);
- months, days and weather;
- food (fruit, vegetables, meat and seafood, breakfast, dinner, lunch, taste);
- music;
- transportation;
- home (furniture, clothes, places at home, things in a room, things happen at home);
- classroom (furniture, things in a classroom, people at school, courses);
- toys;
- numbers, shapes, colours;
- anniversaries (Christmas, Easter, 25 of March, 28 of October).

### 3.2 Microstructure

In the “Lexicon” section, depicted in Figure 2, detailed information about the orthographic form and semantics of the lemmas is provided. This includes definitions, examples, synonyms, antonyms, and word families. Additionally, pragmatic labels are incorporated to enhance user understanding, offering cultural insights and contextual connections to the broader world. Most of the semantic information appears in a second window when the user selects the “**see more**” option beneath the photo. This design choice accommodates students of various educational levels.



Fig. 2: Semantic details, meanings

Furthermore, it was decided that each entry would include details about the phonetic forms of lemmas in various arrangements (alphabetical and thematic). Users can listen to the pronunciation of each entry by clicking on the corresponding button. The words were recorded by the researcher in the +MorPhoSe/SynMorPhoSe Linguistics Laboratory using specialized equipment. This feature aims to provide users with easy access to the correct pronunciation of all the words.

In selecting illustrations, particular attention was paid to the age and cultural background of the users (Biesaga, 2016). Many of the images were generated using Image Creators equipped with Artificial Intelligence capabilities. However, it's important to note that these image generators typically offer only a limited number of free attempts for image creation. Consequently, the assistance of a graphic artist was necessary to ensure the completion of the dictionary.

## 4. Conclusion

As of now, most phases of the lexicographical process involved in creating Helix have been completed, including preparation, data acquisition, computerization, and data processing. Upon the completion of all dictionary construction phases, feedback will be solicited from target users to assess its user-friendliness, usability, and quality (de Schryver & Prinsloo, 2000; Klosa, 2013).

Once Helix is finalized, intervention programs related to dictionary use will be implemented in Greek Heritage Language (GHL) classrooms. This initiative serves a dual purpose: a) to enhance heritage language speakers' strategic dictionary use and effectiveness, and b) to evaluate the dictionary's utility as an educational tool for educators in heritage language classrooms (Polinsky & Kagan, 2007).

The insights gained from these initiatives will inform decisions regarding enriching the dictionary to cater to intermediate low (K4-K5) and intermediate mid-high (K6-K8) heritage language speakers.

This study offers invaluable insights into pedagogical lexicography, highlighting the strategic integration of learner's dictionaries with existing curricula and educational materials. This synergistic approach aims to establish a comprehensive framework for vocabulary development, thereby significantly contributing to the enhancement of language proficiency.

## References

- Benmamoun, E., Montrul, S., & Polinsky, M. (2013). Heritage languages and their speakers: opportunities and challenges for linguistics. *Theoretical Linguistics*, 39(3–4), 129–181.
- Biesaga, M. (2016). Pictorial illustration in dictionaries. The state of theoretical art. In T. Margalitadze, & G. Meladze (Eds.), *Proceedings of the XVII EURALEX International Congress* (pp. 99–108). Ivane Javakhishvili Tbilisi University Press.
- Carreira, M., & Kagan, O. (2011). The results of the national heritage language survey: Implications for teaching, curriculum design, and professional development. *Foreign Language Annals*, 44(1), 40–64. <https://doi.org/10.1111/j.1944-9720.2010.01118.x>
- Chadjipapa, E., Gavriilidou, Z., Markos, A., & Mylonopoulos, A. (2020). The Effect of Gender and Educational Level on Dictionary Use Strategies Adopted by Upper-elementary and Lower-secondary Students Attending Greek Schools. *International Journal of Lexicography*, 33(4), 443–462.
- de Schryver, G.-M., & Prinsloo, D. J. (2000). Dictionary-Making Process with 'Simultaneous Feedback' from the Target Users to the Compilers. In U. Heid, S. Evert, E. Lehmann, & C. Rohrer (Eds.), *Proceedings of the Ninth EURALEX International Congress* (pp. 197–209). Inst. für Maschinelle Sprachverarbeitung.



- Gavriilidou, Z., & Garoufos, A. (2022). The lexicographic protocol of MikaelaLex: a free online school dictionary of Greek accessible for visually-impaired senior elementary children. In A. Kloosa-Kückelhaus, S. Engelberg, C. Möhrs, & P. Storjohann (Eds.), *Dictionaries and Society*, (pp. 563–568). IDS-Verlag.
- Gavriilidou, Z., Markos, A., & Konstantinidou, E. (2024). How Can We Raise Strategic Dictionary Use in the Classroom: The Effect of a Dictionary Awareness Program on Dictionary Use Strategies. *Lexikos*, 34(1), 99–122. <https://doi.org/10.5788/34-1-1882>
- Gavriilidou, Z., & Mitits, L. (2019). Profiling Greek heritage language speakers in the USA and Russia. *European Journal of Language Studies*, 6(1), 28–42.
- Gavriilidou, Z., Mitis, L., Mavrommatidou, S., Chatzipapa, E., & Dourou, C. (2019). The compilation of Greek heritage language corpus (GHLC): a language resource for spoken Greek by Greek communities in the U.S. and Russia. *European Journal of Language Studies*, 6(1), 61–74.
- Gavriilidou, Z., & Mitits, L. (2021). The Socio-linguistic Profiles, Identities, and Educational Needs of Greek Heritage Language Speakers in Chicago. *Journal of Language and Education*, 7(1), 80–97. <https://doi.org/10.17323/jle.2021.11959>
- Gavriilidou, Z., & Mitsiaki, M. (2022). *Curriculum for teaching Greek as a Heritage Language: a framework for teachers*. Ed. Office of Greek Education of the Greek Orthodox Archdiocese of America. 2kProject.
- Gavriilidou, Z., Mitsiaki, M., & Mitits, L. (2023). Strengthening Heritage Greek Vitality in the United States through a Community-Based Curriculum. *Heritage Language Journal*, 20(1), 1–28. <https://doi.org/10.1163/15507076-bja10021>
- Hamdi, C. (2015). The Effects of Electronic Dictionary Use on Reading Comprehension and Vocabulary Retention of EFL Students. *Arab World English Journal*, 180–191.
- Klosa, A., (2013). The lexicographical process (with special focus on online dictionaries). In R. H. Gouws, U. Heid, W. Schweickard, & H. Wiegand (Eds.), *Dictionaries. An International Encyclopedia of Lexicography: Supplementary Volume. Recent developments with focus on electronic and computational lexicography* (pp. 517–524). Walter de Gruyter.
- Ma, J. H., & Cheon, H. J. (2018). An experimental study of dictionary use on vocabulary learning and reading comprehension in different task conditions. *International Journal of Lexicography*, 31(1), 29–52.
- Polinsky, M., & Kagan, O. (2007). Heritage languages: In the ‘wild’ and in the classroom. *Language and Linguistics Compass*, 1, 368–395.
- Polinsky, M. (2015). Heritage languages and their speakers: State of the field, challenges, perspectives for future work, and methodologies. *Zeitschrift fuer Fremdsprachwissenschaft*, 26, 7–27.
- Shen, Z. (2013). The effects of vocabulary knowledge and dictionary use on EFL reading performance. *Canadian Center of Science and Education*, 6(6), 77–85.

Shieh, W., & Freiermuth, M. R. (2010). Using the DASH Method to Measure Reading Comprehension. *TESOL Quarterly*, 44(1), 110–128.

Tono, Y. (2001). *Research on Dictionary Use in the Context of Foreign Language Learning: Focus on Reading Comprehension*. Lexicographica Series Maior 106. Niemeyer.

Wiley, T. G. (2008). Dialect speakers as heritage language learners: A Chinese case study. In D. Brinton, & O. Kagan (Eds.), *Heritage Language: A New Field Emerging* (pp. 91–106). Routledge.

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