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(APPLIED) LINGUISTICS IN THE ERA OF ARTIFICIAL INTELLIGENCE: CHALLENGES AND OPPORTUNITIES FOR TEACHING¹

This paper addresses the question of where (applied) linguistics stands within ongoing developments in artificial intelligence, in particular linguistically non-interpretable large language models. It is argued that, despite differences of approach, (A)L as a field should use the AI being in the spotlight as an incentive for dedicating more attention to the teaching of linguistics, by expanding the target audience and by better defining core knowledge about language for diverse educational contexts. A stronger strand of pedagogical research within (A)L is also advocated for, incorporating empirical and peer-reviewed research distinctive of SoTL – the scholarship of teaching and learning.

Keywords: interdisciplinarity, teaching (applied) linguistics, artificial intelligence, knowledge about language, scholarship of teaching and learning

1. INTRODUCTION

About two decades ago, Mark Liberman famously wondered about the future of linguistics, defining the discipline as “small, weak and inward-looking” (Liberman, 2007), and suggesting its re-invention as eScience – “computationally intensive science using immense data sets” (Liberman, 2010). Similar views continued to be expressed by other scholars, highlighting the need for linguistics to make its role

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¹ The ideas expressed in this paper derive from or are otherwise closely linked to the work conducted within two institutional partnerships, ReLDI (*Regional Linguistic Data Initiative*, financed by the Swiss National Science Foundation, 2015-2018, project 160501), and UPSKILLS (*Upgrading the SKills of Linguistics and Language Students*, Erasmus+ KA2, 2020-2023, 2020-1-MT01-KA203-074246). I am grateful to all colleagues, as well as other project participants, for their insights, fruitful discussions and engaging events.

in research and society clearer, bringing together its legacy as part of humanities/social sciences and the growingly interdisciplinary, quantitative and technological turns (see Abney, 2011; Hagoort et al., 2014; Weninger & Andres, 2007).² While computing power and the amount of available language data have but increased in the meantime, the trend appears to have benefitted computer science significantly more than linguistics, with the gap between computational branches and the “traditional”, “theoretical”, or “symbolic” linguistics widening (cf. Church & Liberman, 2021). Most notably perhaps, since the release of ChatGPT in late 2022 (OpenAI, 2023), many people have learned about large language models (LLMs), but most without learning much new about language.³

Modelling how language works has, in one way or another, always been part of linguistic interests. Other than a means of communication and a biological capacity of its speakers, a typical description of language is that as “observed linguistic behaviour explainable by underlying, unobserved, linguistic rules” (Samardžić, 2019, p. 7, in relation specifically to text). And indeed, one of the core assumptions behind all of its scientific study is that language is not random, and that its workings can be explained if we manage to uncover the hidden rules that govern its different aspects. In that sense, even the basic units we know as sentences, words or syllables are in fact models of an observable physical signal, in its acoustic or graphic form; the modelling only becomes more obvious with more abstract concepts such as subject and predicate, or phoneme and morpheme (see also Good, 2022, for the distinction between data from observable linguistic behaviour vs. analytical structures applied to observable data). Most linguistic theories can be described as nets of smaller models, defined as “symbolic” due to relying on rules applied on human-readable symbols, i.e. units that can be given a context-independent interpretation (such as a letter or a phoneme; see e.g. Hulstijn, 2002).

LLMs, on the other hand, are linguistically simpler models that predict what comes next. More specifically, language models in the computational sense predict the probabilities of upcoming tokens, based not on a system of linguistic rules, but on some form of statistical-associative tendencies, with LLMs being the most advanced in a

² A detailed account of Hagoort et al. (2014), a roundtable discussion at the 47th Annual Meeting of the Societas Linguistica Europaea, is available at <https://dlc.hypotheses.org/754> (last accessed on 16 August 2025). Other examples of discussions about the future and the relative (un)popularity of linguistics include venues from expert blogs (e.g., https://facultyof_language.blogspot.com/2015/02/the-future-of-linguistics-two-views.html by Norbert Hornstein, last accessed on 14 August 2025) to largely non-expert reddit threads (e.g., https://www.reddit.com/r/linguistics/comments/s5k7uu/why_is_linguistics_relatively_unpopular/).

³ It is indicative that language and linguistics departments are rather regularly being reduced, dispersed and closed, or threatened to be so, even at big universities (see e.g. <https://languageblog.ldc.upenn.edu/nll/?p=60221>, last accessed on 14 August 2025, and more recently <https://chicagomaroon.com/48215/news/uchicago-arts-humanities-division-to-restructure-amid-historic-funding-pressures/>, last accessed on 16 August 2025).

series of algorithm types – they are scaled-up versions of pre-trained language models, linked in turn to neural language models (see e.g. Zhao et al., 2023).⁴ As such, they are in fact not a novelty in the linguistic landscape: their core principles are strikingly similar to those behind connectionist models, also typically represented as neural networks and based on parallel distributed processing, where knowledge also relies on sub-symbolic and hidden units and on distributed patterns of activation (Rumelhart & McClelland, 1986; see also Hulstijn, 2002). However, while connectionism remained a relatively minor strand in language research, little known outside academia, LLMs spread in most areas of human life, questioning the usefulness of linguistic rules in a more serious manner (see e.g. Divjak & Milin, 2025).

However, going back to the crisis cited by Liberman, it started manifesting itself long before the advent of LLMs, gradually making the situation of the last decades quite different to where language analysis started from and to where it developed towards until the mid-20th century, which was a foundational role in education and a central place in both cognitive and computer science. To list but a few historical examples, language analysis occupied a central place in the classical-to-medieval liberal arts education, through the core *trivium* composed of grammar, logic and rhetoric,⁵ while later on comparative linguistics became a model of the scientific method, and generative grammar placed language at the very centre of cognitive science, which it in fact helped create (Jackendoff, 2007; Liberman, 2007). Questions, therefore, come to mind naturally: What is it that we linguists are missing? Has the world simply changed and not much can be done, or have we contributed to bringing the discipline in this position? How did a field once central to so many areas transform into one that appears to be looked down upon by neighbouring disciplines and the broader public alike? And crucially, given that we do still see our field as very much worthy, what can we do to restore the trust and respect we believe it deserves?

With this picture in mind, in the present paper I address the question of where (applied) linguistics – (A)L – stands within the ongoing developments in artificial intelligence – AI – as instantiated in LLMs. I specifically focus on pedagogical tendencies and argue that despite differences in how they approach language, (A)L as a field should use the AI and LLMs being in the spotlight as an incentive for dedicating more attention to the teaching of linguistics. On the one hand, this involves expanding the target audience and defining the target knowledge not only for linguists and other language professionals, but also for experts from neighbouring fields, such as computer

⁴ Obviously, as language models developed, the tasks they could perform grew progressively more complex; nonetheless, the core idea of predicting upcoming items remained largely unaltered (Zhao et al., 2023).

⁵ The three arts explored respectively the mechanics of language, the mechanics of thought and their application to persuading the listener – skills considered central for a free person's participation in civic life (https://en.wikipedia.org/wiki/Liberal_arts_education#Seven_liberal_arts, last accessed on 16 August 2025).

science. On the other hand, in order to achieve this objective, it appears desirable to develop a stronger strand of pedagogical research within linguistics, reflecting more on the kind of knowledge about language (KAL) that different audiences need, but also engaging more actively in the scholarship of teaching and learning (SoTL). While many of the points made in the paper are particularly relevant for the more theoretical/descriptive strands of linguistics, the applied branch – very broadly conceived – is considered jointly, due to heavy reliance on linguistic frameworks, due to often sharing their intellectual destiny, and due to one of the central applied areas, namely language learning and teaching, being a major point of contact with linguistic analysis for the broader public.

The paper is organised as follows. Section 2 provides details about the (inter)disciplinary status of (A)L, discussing its relationship with neighbouring fields, the beyond-disciplinary skills required to work with language, and the changes brought about by the developments in AI and technology broadly speaking. Section 3 zooms in on the subject matter of linguistics-related courses, the skills they equip students with, and similarities vs. differences in courses for linguists vs. non-linguists. Building on this, Section 4 is dedicated to pedagogical concerns as a dedicated research topic within (A)L, highlighting both a historically sparse interest and recent initiatives that do assign more importance to teaching, with an outline of some possible steps towards building a more solid pedagogical base. Finally, Section 5 brings some moderately optimistic concluding remarks.

2. (A)L AT THE FOREFRONT OF THE STUDY OF LANGUAGE

2.1 The core and the interdisciplinarity

Broadly speaking, (A)L focuses on discovering and understanding the rules and patterns of language. This means trying to make sense, globally, of the physical signal that languages are made of, e.g. by defining smaller units the signal can be divided into (such as sentences and words), and by looking at how these units come about and how they are connected to each other (cf. de Saussure's paradigmatic and syntagmatic relations between linguistic signs). In order to do this, it is necessary to solve many local puzzles and address many specific language phenomena, such as case and number assignment, or patterns of new word integration. As an example, in the context of major student-led anti-corruption protests taking place in Serbia in 2024 and 2025, the word *ćaci* (/tɛatsi/) emerged, denoting regime supporters lacking critical thinking skills. It is linguistically interesting that this new word is mostly used as masculine singular, despite starting off as incorrect Cyrillic spelling of the masculine plural *đaci* (/dzatsi/), meaning 'pupils, students' (Cyr. *ђаџу* : *ђаџу*);⁶ that is, it is treated on a par

⁶ The incorrect spelling appeared within the *Ćaci u školu* (Cyr. *Ђаџи у школу*) 'Students back to school' graffiti painted on a secondary school in Novi Sad in January 2025; after an initial series of largely humorous reactions, the word turned into a major cultural and political phenomenon (<https://>

with borrowed nouns and (largely borrowed) personal names and nicknames, which *-i* mostly occurs on in the singular (cf. *Jeti* ‘Yeti’, *Džoni*, *Miki*), rather than leading to the singular form *ćak* following the model of *đak* ‘pupil, student’.

The search for rules can involve looking at the system of specific single languages (such as Serbian in the above example), comparing two or more different languages, or trying to capture the languages of the world, with attention given to contemporary language, or to how languages develop(ed) over time. The rules are in addition inevitably linked to the biological and cognitive properties of speakers on the one hand, and to the social and cultural context the speakers operate in on the other (the social aspect being prominent e.g. in the *ćaci* case, where broader context contributed to the new word’s morphological and semantic definition, as well as frequent use). As illustrated in Figure 1, this makes language a multi-faceted phenomenon and it inevitably leads to interdisciplinarity as a key feature to its full understanding.⁷

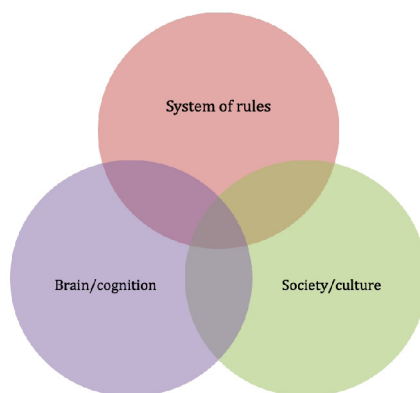


Fig. 1: The three faces of language

The study of language, throughout its history, has gone through various phases, during which the emphasis has been placed on different areas of Figure 1, from socially and culturally oriented analyses of the language of important religious writings, or the language of great writers and the interpretation of their works, to an interest in language disorders and their links with the human anatomy, to seeing language as a system made up of interrelated signs, or governed by rules that allow

en.wikipedia.org/wiki/Ćaci_u_školu), snowballing into more linguistic innovation, as in *Ćacilend* for the government-organised anti-protest camp set up in a centrally located park in Belgrade (<https://www.balcanicaucaso.org/eng/Areas/Serbia/Cacilend-and-the-attempts-to-create-incidents-in-Belgrade-236902>); all linked pages were last accessed on 31 August 2025.

⁷ Biological properties other than those related to the brain are of course relevant for language (e.g., the speech apparatus); the brain is of particular interest here due to direct links with cognition and learning.

grammatically correct sentences to be generated, to the expression of linguistic rules using formalisms from logic and mathematics (see Robins, 2013). Figure 2 illustrates but one part of the inherent interdisciplinarity of this endeavour and the links between linguistics and other research areas, sometimes rather distant from each other, with linguistic subdisciplines ranging from anthropological to neurolinguistics.⁸

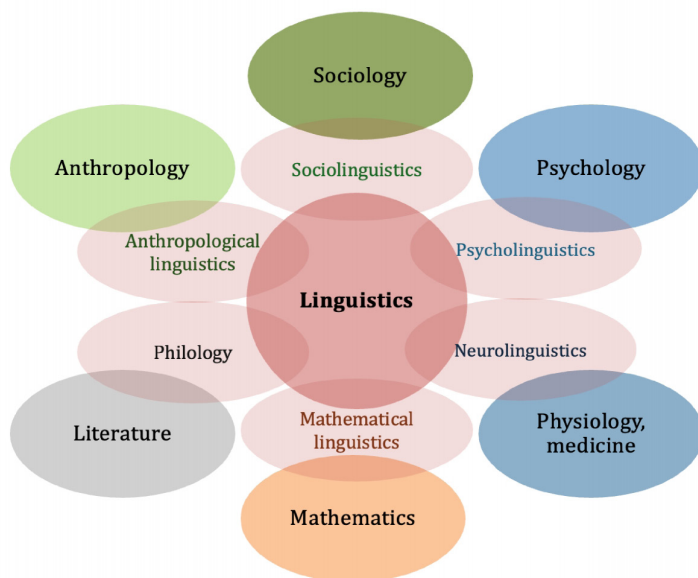


Fig. 2: The inherent interdisciplinarity of linguistics

Focusing on the more recent past, with the development of computers, mathematical linguistics largely blurred into computational linguistics, and a new kind of interdisciplinarity arose over time, where the computational branch largely stopped being an application of computer science to solving problems from linguistics, and developed instead into a parallel research strand cultivating its own approaches to language and solving practical tasks often removed from the core interests of linguistic inquiry (e.g., sentiment analysis), and typically doing so without reliance on symbolic and rule-based analysis typical of linguistics, going instead for black-box approaches based on neural networks and deep learning.⁹ In the words of Church &

⁸ The diagram does not aim at exhaustiveness. Several branches of linguistics are omitted for simplicity of representation (e.g., evolutionary linguistics), as are additional contributing disciplines (spanning from acoustical physics to semiotics).

⁹ To some extent, different views of the scope of computational linguistics still co-exist. The Association for Computational Linguistics includes in its definition of the field that computational models of linguistic phenomena “may be ‘knowledge-based’ (‘hand-crafted’) or ‘data-driven’ (‘statistical’ or ‘empirical’)”, and states explicitly that work can be motivated from a scientific perspective, but

Liberman (2021, p. 1), “Computational Linguistics is an interdisciplinary topic that has been closer to Linguistics at times, but is currently closer to Computer Science (Engineering), and especially Machine Learning.”. LLMs have recently widened the gap and pushed computational linguistics even more towards engineering, thanks to being highly successful in many complex tasks involving language despite being end-to-end boxes whose inner workings are not entirely known (but do not appear to be based on the same kind of rules (A)L tends to be interested in). Figure 3 is an attempt at displaying this relationship.¹⁰

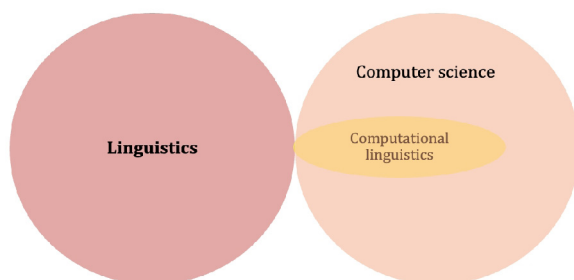


Fig. 3: The new interdisciplinarity of linguistics

A picture that emerges is that while the need for interdisciplinarity is unquestionable, the position of linguistics in the interactions with other disciplines interested in language has not always been an equal or a favourable one, and the subdisciplines containing “linguistics” in their name have sometimes been entirely claimed by others, with computational linguistics as a particularly striking example.¹¹ Psycholinguistics comes to mind as a fairly well-balanced interdisciplinary area in which psychologists and linguists truly collaborate and experts from both disciplines are present in teaching and research (see e.g. Divjak & Milin, 2025); this collaboration,

can also be purely technological (<https://www.aclweb.org/portal/what-is-cl>, last accessed on 15 August 2025). Tsujii (2021), in contrast, places a lot of emphasis on theoretical work as defining for computation linguistics, which he perceives as a subfield of linguistics, contrasting it with natural language processing (NLP) as an engineering field; the author in fact calls for NLP and computational linguistics to be re-connected, stopping NLP (esp. the new work based on LLMs) from entirely separating itself from linguistics.

¹⁰ The size of the computational linguistics portion is not intended to represent its relative slice, or its prominence and importance within computer science.

¹¹ Notable exceptions within computational linguistics and NLP include Tsujii (2021), who provides a diagram of interdisciplinary connections in which computational linguistics is much more closely linked to linguistics (p. 708), and Opitz et al. (2025), who highlight the importance of linguistic expertise and formulate the acronym RELIES, from Resources, Evaluation, Low-resource settings, Interpretability, Explanation, and the Study of language, to stress the past, present and future contributions of linguistics to NLP.

however, is not without occasional tensions, with instances of psychologists looking down on linguists (despite the subdiscipline owing its existence to work in generative linguistics; cf. Jackendoff, 2007).¹² An opposite situation is found perhaps most prominently in sociolinguistics, which remains firmly grounded on the linguistic side, likely due to an extensive shared epistemological and methodological basis of linguistics and sociology, and a longer historical tradition of the social study of language(s) (see e.g. Meyerhoff, 2019).

While interdisciplinarity being complex and challenging is not new, and is certainly not specific to (A)L (see e.g. Frodeman, 2017), in a relatively small discipline facing what seems to be a widespread decrease in appreciation from the outside, it appears justified to further reflect on the problems encountered and possible reasons behind them.

2.2 Issues and missed opportunities

Despite being the only scientific discipline entirely devoted to the study of language, it is clear from above that (A)L is not always appreciated by surrounding fields, or society at large. While there is no simple answer to the question of why this is the case, a number of possible issues having to do with linguistics-internal concerns can be identified.

First, on multiple occasions the contact with neighbouring domains and everyday life saw the predictions of linguistic theories failing to be borne out. Computational linguistics became alienated from linguistic theories following the far-from-optimal results of early rule-based machine translation and related systems, perhaps best illustrated by the famous statement “Every time I fire a linguist, the performance of the speech recognizer goes up”, attributed to Frederick Jelinek in 1988 (see Jelinek, 2005; cf. the notorious ALPAC report on machine translation in the US, Pierce & Carroll, 1966; also Church & Liberman, 2021; Liberman, 2010). Some of the initial psycholinguistic work on sentence processing studied the psychological reality of transformations as defined by transformational grammar, but being unable to confirm it, the generative-based strand of research was at least partly abandoned in favour of more theory-neutral questions such as the integration of syntactic and semantic information in ambiguous sentences (but see Kush & Dillon, 2021; see also Jackendoff, 2007). On the more applied side, the structuralist-based predictions instantiated in contrastive analysis, drawing on systematic comparisons of first language (L1) and second language (L2) structures, led to both over- and underprediction of difficulties, proving overall far from sufficient in explaining the process of L2 learning (Saville-Troike & Barto, 2016); more or less in parallel, the traditional grammar-translation method of

¹² Anecdotal evidence has it that students graduating from language or linguistics degrees are told by psychologists that they can work in psycholinguistics as soon as they also get a BA degree in psychology (while no need is assumed for psychologists to take linguistics courses).

L2 teaching, heavily based on explicit grammar rules, was gradually replaced by more grammatically implicit yet structuralist approaches such as the audio-lingual method, and soon thereafter by the still present communicative methods, more grounded in the cultural context and the affective dimensions than in actual linguistic analysis (for a more detailed overview see Vučo, 2009).

Second, while there is nothing inherently wrong with ideas, methods and theories being disproved – quite to the contrary, especially in the early stages of a field – (A)L has been somewhat unlucky in that it quickly appeared as delivering little on its great initial promise; moreover, it did not always do much to address the inadequacies in a broader interdisciplinary light, investing instead a lot of energy from early on in discipline-internal feuds (cf. Hagoort, 2014; Liberman, 2007; Weninger & Andres, 2007). In other words, despite the ostensible strive for interdisciplinarity, at various points in time there seemed not to be sufficient openness in linguistics to collaboration with others, with linguists insisting on exporting field-internal theories even when they did not translate well into the neighbouring areas; this is evident, for example, in the widespread reluctance towards integrating in linguistic theory probabilistic and distributed views of language (despite their inherent presence in some of the common analytical procedures; see subsection 3.2). Coupled with a somewhat slow adaptation to quantitative methods and the associated statistical analysis, common in many surrounding fields, linguistics also became regularly criticised on methodological grounds (see Gibson & Fodorenko, 2010; think also of field-internal debates on informal acceptability judgements, e.g. in Sprouse et al., 2013, and Linzen & Oseki, 2019, or remarks by linguists themselves about lagging behind in quantitative empirical research, as in Gass et al., 2020, in the subfield of second language acquisition).

Third, there appears to be a widespread lack of understanding of what linguistics is about, often not just in the broader public, but also among academic researchers from other fields. Linguistics is once again not alone in this, as many people are unfamiliar with what many other experts do (with nuclear physicists as a classical example of an opaque profession), but everyday life and history do not aid linguists: as pointed out by Bugarski (1996), people experience language all the time (unlike nuclear physics) and tend to have strong opinions about it, often without seeing the need for expert study. Additionally, a lot of effort over time has been invested in prescriptive traditions, devoted to defining what language use should be like, an approach of marginal relevance for modern linguistics, but still very much alive in schools and in the public discourse of many countries, making the broader public “careful about errors” around linguists (Grandi, 2020; see also Spring et al., 2000), instead of asking them for opinions on truly linguistically relevant issues. Linguists, on their side, have not always been too willing to engage with the public to explain their work, contributing to not having a more prominent expert role in language-

related issues in broader society (as commented upon by Feldhausen, 2022, in relation to the debate on gender-neutral language in Germany; but see Jackendoff, 2007, for some notable exceptions, such as the societal acceptance of sign languages as natural languages). Outreach initiatives have lately started to grow; prominent examples include the community of Bilingualism Matters,¹³ the recently introduced outreach sessions at the annual conferences of the Societas Linguistica Europaea,¹⁴ as well as somewhat more local initiatives such as the volume dedicated to “Everything you ever wanted to know about language and languages”, edited by Masini & Grandi (2017), and the website *Linguisticamente* in Italy, the podcast *Word to the Whys* in Canada, or the *LingComm – Communicating Linguistics to Broader Audiences* community and biannual conference in North America.¹⁵

Looking at the listed issues, it is evident that some are being abundantly addressed. In addition to the growing number of outreach initiatives (see also Sections 3 and 4 on the interest in teaching at levels from school to university), an incredible amount of work is being dedicated to research designs, methods of data collection, and advanced statistical analysis (Kortmann, 2021; McGillivray & Jensen, 2023; Winter, 2022; among others), often incorporating experiences and insights from other disciplines, and adding concerns linked to open science and to making data FAIR – Findable, Accessible, Interoperable, and Reusable (cf. Collister, 2022, as well as the European Open Science Cloud and the initiatives by CLARIN ERIC).¹⁶ Importantly, there is also an increase in the attention paid to the education of future researchers, and language and linguistics students in general, with an awareness that the knowledge and skills traditionally associated with linguistic analysis no longer suffice.

2.3 In search of new skills

Due to its multi-faceted nature (cf. subsection 2.1), human language can be explored from many different angles, each requiring a different methodological approach. Contemporary (A)L sees the use of methods ranging from (growingly infrequent) introspection, fieldwork in communities whose language is being studied, analysis of large textual corpora, experimental language tasks, brain activity recording, application and training of computer algorithms, and a number of other approaches and techniques, many of which are data-intensive and require careful data management and quantitative analyses in addition to the qualitative ones. It is thus

¹³ The community is invested in making “the research-based evidence on multilingualism and language learning available and accessible to families, communities, and professionals in education, health or policy” (<https://www.bilingualism-matters.org/who-we-are>, last accessed on 16 August 2025)

¹⁴ Recordings at https://www.youtube.com/@Societas_Linguistica_Europaea (last accessed on 31 August 2025)

¹⁵ <https://www.linguisticamente.org>; <https://sites.google.com/view/word-to-the-whys-podcast/home>; <https://lingcomm.org> (all pages last accessed on 16 August 2025)

¹⁶ <https://www.clarin.eu/eosc>, <https://www.clarin.eu> (both pages last accessed on 31 August 2025)

beyond clear that narrow specialisation in “armchair” linguistic analysis is insufficient and additional knowledge and skills need to be acquired by (A)L specialists.

Work with language is at the same time one of the contemporary fields that is changing particularly rapidly in terms of job market opportunities and requirements. Linguists now have LLMs at their disposal both as assistants in traditional research (Ambridge & Blything, 2024; Koeva, 2024; Zappavigna, 2023) and as a research subject (Kallens, 2023). Translators learn how to use machine translation complemented by manual revision (paradigm known as Machine Translation Post-Editing; see e.g. Rothwell et al., 2023), and language teachers increasingly include language learning applications and chatbots in their teaching activities (Guaqueta & Castro-Garces, 2018; Huang et al., 2022). Parallel to the integration of new tools in old jobs, entirely new language professions are emerging, focused on the development and/or testing of language technologies – “prompt engineer”, “linguistic data analyst”, “language engineer” and “AI language specialist” are just some of the latest jobs requiring knowledge of languages and linguistics (Ferraresi, 2025; Secară et al., 2025). While a degree in linguistics (and to a lesser extent in modern languages) continues to be perceived as not linked to a very specific job profile outside academic research and teaching,¹⁷ the number and the range of available options are changing. And despite universities not being vocational schools, such changes in the job marked necessarily impact educational needs and degree programmes too need to address the advances in technology, by making new graduates familiar with it, and able to work with and on it. When it comes to languages, simple familiarity with a tool such as ChatGPT falls short of the target: language professionals are much better off having an idea of how LLMs and other computational algorithms work, what they are based on, and what they can – and cannot – do. This in turn clearly calls for a new skill set spanning languages and engineering/programming.

Numerous initiatives have already addressed the need for new knowledge and skills in language professionals, mapping them out, and providing training materials. EU-funded projects, especially in the Erasmus+ framework, have been particularly prominent; DigiLing (<http://www.digiling.eu>), EFFORT (<https://www.effortproject.eu>) and LT-LiDER (<https://lt-lider.eu>) are but some examples. Most relevant for

¹⁷ Cf. Lazzeroni (1992), on the absence in Italy of the profession of *glottologo condotto* ‘appointed historical linguist’ – contrary to an appointed family doctor – which, however, has never implied an absence of job positions open to linguists. The opportunities now typically listed on websites of study programmes and professional associations include a broad range of careers, ranging from translation to journalism, and even work for governmental services such as FBI and CIA in the US (see the leaflet published by the Linguistic Society of America, <https://as.nyu.edu/content/dam/nyu-as/linguistics/documents/WhyMajorinLinguistics.pdf>). Additional options include collaboration on the detection of language disorders and dementia, writing guidelines for easy/plain language to be used in public administration (see e.g. Grandi, 2020; also Hilpert (2022) and <https://www.linguisticscareerlaunch.com/resources/>; all pages last accessed on 16 August 2025).

the present paper is the UPSKILLS project (<https://upskillsproject.eu>), dedicated to *Upgrading the SKills of Linguistics and Language Students*; active from 2020 to 2023, this Erasmus+ strategic partnership looked at sources of information ranging from scholarly writings to university curricula, to job advertisements and interviews with representatives of the language industry, and it proposed a new, composite professional profile labelled the *language data and project specialist* (Miličević Petrović et al., 2021). The profile is summarised in Figure 4.

Language data and project specialist

- knowledge, skills and competences -

DISCIPLINARY

- Knowledge of specific languages
- Ability to conduct linguistic analysis
- Translation, interpreting, post-editing, localisation

(INTER)CULTURAL

- Awareness of specific cultural contexts and cultural differences
- Cultural agility

TRANSVERSAL

- Creative and innovative thinking
- Problem-solving skills
- Presentation skills
- Writing for different audiences



TECHNICAL

- Understanding and use of language technologies and resources
- Understanding of computational linguistics / NLP
- Knowledge of a programming language

DATA-ORIENTED

- Ability to collect, manage, curate, analyse language data
- Knowledge of statistics
- Familiarity with data standards

RESEARCH-ORIENTED

- Knowledge of research design
- Analytical, logical and hypothetical thinking
- Accessing and processing information critically

ORGANISATIONAL

- Entrepreneurship
- Project management
- Quality control
- Planning
- Teamwork

Illustration by Freepik Storyset, <https://storyset.com/data>

Fig. 4: The language data and project specialist profile

The central idea is for the language data and project specialist profile to serve as a guide in selecting the skills and competences to be taught and learned within language and linguistics degree courses. The skills are divided in seven clusters, and most new jobs in the industry call for all seven, with each cluster's relative contribution depending on the specific position, and with the specific skills dependent on the degree course specialisation. The clusters can also indicatively be grouped in “old” and “new” skills (cf. Miličević Petrović, 2025). The three to the left, namely disciplinary, intercultural and transversal cluster, have always been present in language- and linguistics-related education, and are generally judged by all stakeholders as being at a satisfactory level. The four clusters to the right, technical, data-oriented, research-oriented and organisational, lean more to the side of “new” – some elements more so than others – with the focus typically being on the technical and data-oriented ones. This is fully understandable given the historical moment: large amounts of data are easily accessible, but they require automatic processing and

analysis that is predominantly quantitative; this is precisely what contributes most to the impression that modern language professions require a degree not only in the domain of language/linguistics, but also in computer or data science. In fact, it is not uncommon to see job advertisements for positions that contain “linguist” in the title and list a degree in computer science among the requirements (cf. Ferraresi et al., 2021).¹⁸

A summary of the lessons learned in UPSKILLS is thus that both macro types of skills are required, with the new ones being more in need of improvement due to previously being largely absent from the curricula. Accordingly, projects typically offer pedagogical materials on programming, statistics, and related technological/big data areas. Nevertheless, it is important to recall that no new skills are useful in isolation and should instead be connected to disciplinary knowledge. Moreover, as will be discussed in the remainder of the paper, skill improvement is also desirable in the disciplinary sense, contra the current tendency to somewhat favour the method at the expense of content (cf. Sönning & Werner, 2021).

3. (A)L AND KAL: WHAT KIND OF KNOWLEDGE ABOUT LANGUAGE IS NEEDED TODAY?

3.1 What is typically taught in (A)L and what is missing?

Different sources of information point to the need to improve the position of (A)L in interdisciplinary research and in society. In addition to introducing new skills, a central path that can allow for changes in this sense is through teaching, in particular at undergraduate level (as mentioned by Liberman, 2007, and agreed upon by a number of other authors, see below). Teaching, however, can only help if it is fully adequate for the students at hand, providing them with knowledge about language – KAL – that is relevant to their studies and their future profession(s).¹⁹ While seemingly obvious and self-explanatory, this prerequisite is in fact not always fulfilled. In this subsection, I reflect upon some of the less prominent findings of the UPSKILLS project that point to this, analysing them in the light of common teaching practices in linguistics (see also Miličević Petrović, 2025).

While the results of the UPSKILLS needs analysis overall revealed that disciplinary knowledge, where KAL is comprised, is beyond satisfactory in graduates from language and linguistics programmes (Gledić et al., 2021), some observations were also made by industry representatives that point to possible issues with the kind of knowledge possessed. More precisely, while knowledge of specific languages and

¹⁸ Cf. the meme at <https://x.com/checarina/status/1394459967986442240> (last accessed on 31 August 2025)

¹⁹ KAL for ‘knowledge about language’, i.e. knowledge of linguistic facts and principles, is adopted following Hudson (2008, p. 54), who quotes it as an established term in the tradition of teachers and education managers in the United Kingdom.

linguistic theory are generally very much appreciated in the job market, what is also highlighted as central is the ability to apply the theoretical knowledge to practical tasks, “through reasoning about concrete problems, making choices and arguing for them” (Assimakopoulos et al., 2021, p. 7). Also deemed crucial for industry tasks is the ability to maintain multiple perspectives, while language and linguistics graduates “tend to lack the ability to abstract away from their own perspective and to look at problems from, say, an engineering or some other point of view”; in other words, our students have a “hard time detaching from their own interests, which are often very narrow and not relevant to the task at hand” (Assimakopoulos et al., 2021, p. 7). Possibly the most illustrative quote, also reported by Assimakopoulos et al. (2021, p. 7), is that:

“[...] rather than focusing on very specific problems of the academic type (e.g. by conducting detailed structural analyses), language and linguistics graduates should be prepared to ‘get out of their «linguistic boxes»’ and adopt a ‘bigger picture’ approach, in which the central element is the problem to be solved and the focus is on the kind of solution that is needed (which might or might not require a structural analysis.”

The UPSKILLS interviews involved an international (European) market and companies that are in contact with graduate from different countries, pointing to a discipline-wide, rather than a national or a regional problem. As lecturers, we might thus want to ask ourselves about what kind of KAL we are imparting that leads to rather shared non-academic employer views of our students and graduates as being fixed in a certain way of thinking (even though we like to see linguistic analysis as an excellent tool for the development of analytical and critical skills, also allowing for long-term intellectual benefits; see Hudson, 2008; Vallejos-Yopán & Rodríguez-González, 2022; Vo & Moore, 2024). While I am not aware of similar analyses performed in relation to interdisciplinary academic research, it is highly likely that the impressions would be similar (cf. subsections 2.1-2.2 above).²⁰

Despite their being directly called out in the cited comments, it would be unfair to look at the student and graduate populations evaluated in the UPSKILLS project as lacking; the responsibility is primarily to be looked for among their (former) teachers, who pass(ed) on a partly problematic paradigm of thinking and teaching about language. One of the central elements in this paradigm has to do with linguistics continuing to be a rather divided field with competing bigger and smaller theories, from generative vs. functional vs. cognitive/usage-based linguistics, to minimal attachment

²⁰ Anecdotes, or jokes even, are rather regularly being told in linguistic circles of interdisciplinary projects in which team members from other areas complain about spending the project waiting for linguists to agree on the analysis to be adopted.

vs. late closure principles in sentence processing (to name but one out of a myriad of specific examples). With all the benefits of having competing theories and models to keep the discipline lively and engaged in constant theory checking, linguistics also came to be known for “sectarian squabbling in public” (Lieberman, 2007; see also Jackendoff, 2007, and Hagoort’s, 2014, reference to the lasting “linguistic wars”), and for a low fraction of shared or theory-neutral concepts (cf. Haspelmath, 2021; Lehecka & Östman, 2022; Van Rijt & Coppen, 2017).²¹ If linguists are constantly at war in their research, they are likely to transfer the strong feelings into teaching, either by only presenting one theoretical approach, or by mentioning alternatives only to reject them, wasting an opportunity for analytical comparisons between competing views – an activity likely to lead to the development in students of the much valued ability to maintain multiple perspectives.

The theory-driven divisions, however, do not tell the whole story. The findings on rigidity of approach also apply to graduates from modern language and translation degree courses, only exposed to introductory linguistics subjects and/or KAL development within language courses, where the theoretical stance tends to be much less pronounced (see e.g. Kuiper, 2011b). An additional factor that comes into play in this case could be the partly prescriptive background of the discipline(s), involving heavy reliance on normative rules, still widely present in school and university subjects linked to national/dominant standard languages (cf. Wijnands et al., 2021), and possibly more implicit but still fundamental for the L2 classroom, even in communicative settings, through reliance on the target native model (see e.g. Gilquin, 2022).²² The situation could also be somewhat acerbated by the search for descriptive rules of language, inherent to the linguistic enterprise (cf. subsection 2.1); while a quest for laws and regularities is typical (if not defining) of scientific research in general, in linguistics an extra step is needed to tease it apart from prescriptivism. Put differently, much of the teaching about language(s) and linguistics revolves around rules, be it through discovering or prescribing them, and once this approach is internalised, the rules can be difficult to let go of in favour of a more flexible take on linguistic tasks.

It is evident that reliance on rules becomes particularly challenging when tasks to deal with go in the direction of computational linguistics/NLP, which is often the case in industry, but also in interdisciplinary academic research. Linguistic annotation of textual corpora, for example, is a very widespread task that linguists get involved in from their undergraduate studies onwards. A lot of the time, the task appears

²¹ Somewhat to the contrary, Kuiper (2011b, p. 183) asserts that “[w]hen you get a group of linguists together there is remarkable agreement about the domains that are central to linguistics”. However, as the author himself clarifies, this applies only to seeing the levels of linguistic structure from phonetics to semantics as foundational.

²² Many an L2 teacher will confirm that learners often ask for strict rules themselves, in an attempt to reduce the uncertainty and the general difficulty of the L2 learning process.

simple (albeit not particularly stimulating – think of checking or manually assigning thousands of part-of-speech tags), but what often happens next is linguists insisting on modifying elements of the annotation schema because it does not capture a given phenomenon in the best way, even when the choices made in the schema directly reflect the needs of an associated machine learning task (e.g. when it is known that an algorithm cannot learn a linguistically relevant distinction). The need for linguists to understand the basics of the NLP brand of language models and to be able to follow task guidelines is explicitly stated, among others, by Ljubešić (2021), in a talk overall highly appreciative of linguistic insights in NLP.²³ On a somewhat related note, in many situations it is also important for linguists to be able to adapt to topics and problems different from those covered in linguistic research; a possible example is the annotation of semantic similarity between texts, a common NLP task distributed in linguistics across a series of phenomena rarely tackled together (derivational morphology, lexical semantics, etc.).

Finally, a factor in the lack of analytical flexibility that is transversal to all of the above points can be identified in the scarcity of pedagogical research in (A)L. Linguists perpetuate in their teaching the paradigm they have been formed in – and quite unsurprisingly so, given that instructional change is driven by insights about what actually works for students, and in linguistics relatively little is known about that (see Petray, 2004; Taylor-Adams & Gunter, 2024; also Section 4 of this paper). Without careful consideration of the teaching practices, students who specialise in (A)L easily end up in single-approach environments, whereas those from other degree courses, even in adjacent areas such as language teaching or translation and interpreting, often find linguistics difficult and unattractive, falling back on the prescriptive tradition (cf. Spring et al., 2000; see also Berruto, 2020). In the next subsections, before returning in more detail to the topic of pedagogical research in linguistics, I outline some ideas about additional contents and alternative approaches that could be useful for linguistics students, or those specialising in other fields.

3.2 KAL for (future) linguists

What can and should be done in order to offer students a better education in (A)L, and provide them with the analytical skills that the study of linguistics has the potential to develop? How can language be explained to students? What kind of KAL should be taught? A partly different approach is clearly needed for students of (A)L, engaged in a number of specialised subjects, and those that only encounter linguistics through (possibly optional) introductory courses; the latter, for example, might not need detailed analyses by level of linguistic structure, benefitting more from the application of linguistics to real-life phenomena, while for the former a

²³ A summary and the recording of the talk are available at <https://upskillsproject.eu/every-time-i-hire-a-linguist/> (last accessed on 31 August 2025)

phonetics-to-semantics setup is mostly taken for granted, together with some of the interdisciplinary areas (cf. the chapters in Kuiper, 2011a).

Judging from the remarks cited in subsection 3.1, (future) linguists should be made aware of different theoretical paradigms, and rather than being presented with one, with the expectation of simply accepting it because the lecturer/supervisor said so (cf. Jackendoff, 2007), they should be made to focus on understanding and testing theories in a pluralistic perspective. Pedagogically speaking, this needs to be carefully planned, and in many cases it can be justified to initially introduce a single view – as argued by Kuiper (2011b, p. 186), “until a student is familiar with one way of seeing and doing things, providing multiple perspectives can be confusing” – following up with additional views later on. Also to be considered are the concerns of lecturers about having to teach on frameworks they know less about; one practical solution to this issue are courses co-taught by multiple teachers, but for less advanced classes diving into the unknown is probably good for the lecturers themselves (including positive consequences for their research; cf. Jackendoff, 2007).

Another recurring suggestion is to make students work (more) with languages unfamiliar to them; the ability to work with languages one does not speak is explicitly present in industry requirements (Assimakopoulos et al., 2021, p. 5-6), as well as when discussing linguistics as a tool for developing critical skills (cf. Vo & Moore, 2024). While the need to understand how languages pattern together and differ from each other is of course old news for linguists, and not just in the sense of comparative linguistics and linguistic typology (cf. the International Linguistics Olympiad, where tasks are almost entirely based on languages assumed not to be known to the participants),²⁴ there is no harm in reiterating that it is important to go beyond English (and other big European languages) in the classroom too; a typological perspective is useful also in terms of providing material for exercises, beneficial for the development of problem-solving skills. Ideally, exercises in linguistic analysis should be coupled with real-world problems to which KAL can be applied (cf. Assimakopoulos et al., 2021), such as rewriting texts in easy language, testing transcription or annotation systems, evaluating machine translation outputs, and similar (see also subsection 3.3 on the application of linguistics to socially or otherwise relevant topics).

Finally, given the intensive research and the growing number of job opportunities linked to automatic language processing (not to mention the widespread presence of AI in everyday life), linguistics students need to start learning about how language is represented in LLMs and in computational models more generally. While this might not be the same kind of KAL as in linguistics, with even the features previously fed to machine learning algorithms now mostly gone (cf. Zhao et al., 2023),²⁵ an elementary

²⁴ See <https://ioling.org> (last accessed on 2 September 2025); also Neacșu (2024).

²⁵ Features refer here to linguistically interpretable properties such as part of speech, case, number, animacy, etc.

understanding of concepts such as deep learning, neural network, model parameter,²⁶ subword token, or word embedding, is becoming a must for all linguists (not only for those who see themselves as venturing into computational linguistics and NLP). And, as mentioned above (subsection 2.1), these concepts are in fact neither new nor entirely removed from work in (A)L. In addition to connectionism as somewhat of an extreme, many approaches within linguistics assume distributed representations (think of Harris', 1954, distributional structure, or all of the subsequent work in distributional semantics based on vector spaces); even linguistic annotation is typically distributed across multiple features (see Divjak & Milin, 2025). There are even claims that the “space between connectionist and generative models of language is more fluid than the rhetoric might sometimes suggest” (Pater, 2019, p. e54). The indisputable differences, however, additionally highlight the need to present different views of language to students, actively engaging them in comparisons. Working on annotation exercises could be one practical way of doing so, not only for the previously outlined need to follow guidelines, but also for comparing dependency-based syntactic annotation with constituent analysis.

3.3 KAL for non-linguists

A core initial question in thinking about KAL for non-linguists is who needs to receive training in linguistics.²⁷ A distinction is typically made between (future) language professionals not specialising in linguistics (translators, language teachers, speech therapists, etc.) and experts from neighbouring fields, whose profile might or might not be directly linked to language (psychologists, sociologists, education specialists, etc.). Some attention has been dedicated in the literature to both macro groups, with a rather heavy focus on language teachers and translators on the one hand (teachers: Andrews, 2001; Bartels, 2005; Hudson, 2004, 2008; Mendelsohn, 2011; Rankin & Whong, 2020; translators: Almann & House, 2023; Brianti, 2020; Gatta & Mazzoleni, 2020; Malmkjær, 2005; see also Gagliardi, 2019, on linguistics for the health professions), and social sciences and humanities students on the other (see e.g. Correa, 2014, who claims that some form of linguistics should appear in all degree courses dealing with power relations, including political science, gender studies, anthropology, education, literature, communication studies, sociology, psychology, history). Interestingly, despite their increasing involvement with language processing over the past decades, much less has been said about computer scientists.

²⁶ While reminiscent of principles and parameters in generative linguistics, parameters here are mostly weights assigned to different aspects of data that determine how they are processed.

²⁷ In this paper, the focus is on tertiary education. Proposals to introduce linguistics in primary and secondary education are also present in the community, with important work published on the topic (Denham & Lobeck, 2010; van Rijt & Coppen, 2017; a.o.), and with initiatives such as the *Linguistics in Schools Manifesto* of the Societas Linguistica Europaea (available at https://societaslinguistica.eu/wp-content/uploads/2024/10/SLE-Linguistics-in-schools-manifesto_September2024-final.draft_.pdf, last accessed on 2 September 2025).

Views differ as to what linguistics courses for non-linguists should be like, with particular attention, as well as particular disagreement, linked to Introduction to linguistics / LING 101 / General linguistics, or similar, where labels change depending on the country and the programme, but the introductory dimension remains – for most students such a course is their first encounter with linguistics. In many traditions, this course can be described as “baby theoretical” (Spring et al., 2000): it is a survey of the main areas of linguistic inquiry, namely phonetics/phonology, morphology, syntax, and semantics, with a possible addition of pragmatics and discourse, and/or elements of historical linguistics, linguistic typology or sociolinguistics.²⁸ Abounding with new terminology, a linguistics course tailored to this model is likely to be perceived as technical and difficult by (many) students (in the words of Spring et al., 2000, p. 120, “students are often intimidated by a subject about which they know nothing”; see also Berruto, 2020), and as “tough but fair” by (many) lecturers (see e.g. Santilli, 2020, on “How to survive the general linguistics exam”).²⁹ Behind the scenes of similar courses, lecturers are undoubtedly aware of student struggles, but consider the theoretical content to be necessary, and the effort invested justified.³⁰

Multiple authors argue against insisting on the approach with similar core contents for linguists and non-linguists, proposing in the case of non-linguists to be well-informed about their needs and other courses they take (possibly also about what they find difficult),³¹ and to adapt the linguistics course(s) accordingly, making sure the contents are relevant and accessible. The rationale – in addition to not all students being particularly interested in languages and linguistics, and the lecturers wanting the courses to thrive and attract a broad audience (cf. Spring et al., 2000) – is that for many students the introductory course will be the only linguistics course they take, so it is less important to prepare the basis for further study, and it is vital instead to

²⁸ Spring et al. (2000) stress the baby-theoretical orientation also being reflected in textbooks; indeed, one of the few books explicitly defined as *Linguistics for Non-Linguists* (Parker & Riley, 2005) is in fact filled with complex and theory-specific analyses, including highly specialised terms such as X-bar syntax and movement.

²⁹ The cited article is among the most read ones on the Italian popularisation website *Linguisticamente*. The author states “Independently of what your future life choices may be, in ten years you will remember the general linguistics exam as the one you spilled most blood, sweat and tears over.”, and invites the students to accept the facts, “General linguistics exam is difficult: get over it” (Santilli, 2020; translations from Italian are my own).

³⁰ Note that the meaning of “theoretical” changes here compared to linguistics courses for linguists, where theoretical frameworks such as generative and usage-based linguistics are invoked; such frameworks are typically not discussed in detail at the introductory level (see Kuiper, 2011b, p. 186, on LING 101 needing to be, as much as possible, theory-neutral), and the reference here is more generally to an approach that mirrors research in linguistics with few student-friendly adaptations (see e.g. Spring et al., 2000; Feldhausen, 2022).

³¹ Berruto (2020), for example, reports syntax and phonetics to be seen by students as particularly problematic. Bartels (2005), on the other hand, points out that language teachers appreciate the KAL gained in university courses, but struggle to actually implement it in their classroom activities.

leave the students with something they will more easily internalise and apply in their future professional and everyday life.³² Feldhausen (2022) suggests that changing the way linguistics is taught, by focusing more on practical issues and relevance, equals working on the creation of a linguistically more educated public that will more readily seek linguists' advice when appropriate.

Typical topics suggested for introducing linguistic concepts in a way relevant to non-linguists include contextually and socially oriented areas of pragmatics, discourse and sociolinguistics (esp. language variation), and more specific practical components such as language and law, language and power, or the language of politics (see e.g. Correa, 2014; Spring et al., 2000). A key cognitive aspect is language acquisition, especially in the case of language students and future language teachers, given that for them linguistics can play a supporting role for the language learning process (Correa, 2014; Treffers-Daller, 2004); the study of language as cognitive capacity and part of the human mind is naturally central for psychologists. Note that theoretical elements and analysis by level of linguistic structure are not banned in this approach, they are simply introduced through or alternated with more practical topics (Spring et al., 2000). Moreover, some central assumptions about language and linguistics are necessarily covered under all approaches, e.g. that all varieties are equally natural and systematic, and that the higher status assigned to some is not due to linguistic reasons. In other words, students are in any case led towards distancing themselves from prescriptive grammar, taking a more descriptive stance, and understanding what it means to study language scientifically (see Correa, 2014, on “elementary literacy in linguistics”).

Assuming that successful linguistics courses share a willingness to move beyond “baby theory” and to innovate based on students' needs and interests, a question that remains open is what kind of linguistics is appropriate for computer science students. Courses in (A)L are less typical outside social sciences and humanities, and less previous experience about this context is present in the community; yet, with the growth of computational linguistics and NLP, the need for better defining the target KAL for them is also growing. One possible entry point is again the social dimension of language; with computational processing, the focus is particularly appropriately placed on ethics and on biases introduced by the use of large amounts of automatically collected language data and black-box algorithms – computational models and tools often fail to incorporate demographic variation, overrepresenting some speakers and underrepresenting others (by age, gender, native language, etc.), and perpetuating stereotypes such as associating specific professions to specific genders (see e.g. Hovy & Prabhumoye, 2021). While linguists will likely always remain more versed in

³² An exception is given by future language professionals, who tend to have more than one course in (A)L in their curricula. However, they too benefit from a more “gentle” introduction tailored to their specific interests (see e.g. Almann & House, 2023, and Malmkjær, 2005, for translation).

analyzing such phenomena, their basic understanding is also important for computer science students, and it will stay preventively important even if biases decrease over time.

In identifying the biases, basic linguistic concepts and elements of linguistic typology can also be introduced to computer science students,³³ ultimately leading to a comparison between linguistic analysis and the workings of LLMs and other computational language models, similarly to what has been argued for in subsection 3.2 for linguists. Emily Bender's *Linguistic fundamentals for natural language processing* (Bender, 2013; Bender & Lascarides, 2019) are a step toward this goal; even though the #0 premise, "Knowing about linguistic structure is important for feature design and error analysis in NLP" (Bender, 2013, p. 1), appears less relevant today when linguistic features have been largely replaced by enormous quantities of raw text, linguistic knowledge is needed for multiple aspects of NLP tasks (cf. Opitz et al., 2025), as well as for moving towards interpretability and more human-like AI (McShane & Nirenburg, 2021). Moreover, having some such knowledge presented in computer science degree courses facilitates collaboration with linguists – there is in fact no reason to assume that only linguists should actively care about bridging the distance between the fields. Writing for and about computational linguists, Church & Liberman (2021) stressed that it is important to give the next generation as broad a perspective as possible, since the future is likely to be quite different from the present; while knowledge of linguistics was not necessarily among the first things on their mind, their view is quite broadly applicable, and it is quite a useful reminder of university education being more about ways of thinking than about the technicalities of possibly transient specific approaches.

4. (A)L AND SOTL: DO WE GIVE TEACHING THE ATTENTION IT DESERVES?

4.1 Pedagogical research across disciplines

Previous sections of this paper have hopefully conveyed and justified the message that teaching is important for the overall health of a scientific discipline. And indeed, many academic fields have an associated strand of research on how the disciplinary knowledge is transferred, with dedicated journals, associations and conferences. This is particularly true of fields that are also school subjects, and/or tend to be perceived as difficult. Taking statistics as an example, *Teaching Statistics* and *Journal of Statistics and Data Science Education* are but two journals with decades-long tradition, and the International Association for Statistical Education, the Teaching

³³ Automatic processing often involves technology transfer between different languages, giving relevance to typology and, at a more basic level, to different writing systems. Phonetics and phonology will, on the other hand, be particularly relevant for speech technologies.

Statistics Trust, and the Teaching Statistics Section of the Royal Statistical Society are only some of the organisations caring for how statistical education is organised and implemented at different stages of formal education.

Pedagogical research running in parallel with core disciplinary inquiry came to be known under the name of *scholarship of teaching and learning* – SoTL (initially introduced by Boyer, 1990, without the “learning” part). While no generally accepted definition of SoTL exists (cf. Anderson et al., 2024, pp. 277-278), there is somewhat of a consensus on its objective being systematic investigation of students’ learning (in addition to adequate valuing of the teaching aspect of academic careers). Overall, in terms of professional bodies and publications, SoTL has seen livelier developments in the United States and Canada compared to Europe (with the exception of the United Kingdom), possibly reflecting the general tendency of Anglo-American university systems to be more explicit about teaching (think of teaching philosophy statements often required for university positions, cf. Schönwetter et al., 2002, a practice less common in continental Europe). However, European systems compensate by assuming an even stronger upstream definition of education as the first task of universities (cf. the Italian terms *prima, seconda e terza missione* ‘first, second and third mission’, for teaching, research and public outreach respectively); furthermore, SoTL is not the only term to look out for, as *teaching, education/educational* and *pedagogy/pedagogical* are also widely used, especially in discipline-specific contexts – *pedagogical linguistics* can be taken as an example, in addition to the titles cited from statistics. In fact, the choice of SoTL in this paper does not reflect a strong terminological stance, but rather a wish to use a label associated with peer-reviewed research and applicable beyond single disciplines.³⁴

When it comes to SoTL in language-related disciplines, the more vocationally oriented areas, tightly linked to well-identified professions, and either to an industry branch or to public systems, thrive with publications as well as other kinds of teaching-related scholarly activity.³⁵ To take translation and interpreting as an example, *The Interpreter and Translator Trainer* journal is at volume 19 in 2025, having grown from two to four issues per year, and is an impact factor journal that publishes peer-reviewed empirical research on the effectiveness of teaching approaches and classroom practices, as well as work covering curriculum design and trainer training.³⁶ More generally, there is timely and widespread reflection in the field on the changes brought about by developments in society, especially by language technology, and on how to prepare future professionals for what awaits them; the field also regularly takes

³⁴ As is often the case in (A)L, very specific terms such as *Romance pedagogical linguistics* (Feldhausen, 2022) have also been proposed; the specificity, however, often comes at the expense of generalisability.

³⁵ The term “training” is often preferred to “teaching” in these cases, as evidenced by some of the cited titles.

³⁶ <https://www.tandfonline.com/journals/ritt20/about-this-journal> (last accessed on 5 September 2025)

stock of its own pedagogical research (see e.g. Li, 2024). In the language teaching domain, even though it can be difficult to disentangle the pedagogical research from the subject matter that is also pedagogical,³⁷ the field's prominent journals such as *TESOL Quarterly* and *Language Teaching Research* have long been publishing articles dedicated to teacher variables such as attitudes or self-efficacy, and on (L2) teacher training. Less attention, at least internationally, is dedicated to how native language classes are taught, partly due to these classes being a mix of language and literature, and partly due to L1 teaching being, more so than L2 teaching, deeply rooted in specific linguistic/national contexts and traditions (where the language part primarily involves grammar and orthography in some contexts, e.g. Serbia,³⁸ and writing skills in others, such as the United Kingdom).³⁹

The research on pedagogical aspects becomes even less when we zoom in on linguistics, although it must be emphasised that relevant work is fast growing; while classroom experiments might still be infrequent (cf. Terry et al., in press, on getting started with educational research in statistics), there is raising awareness of their importance, as well as an increasing number of peer-reviewed pedagogical papers, recounted teaching experiences and shared teaching materials.

4.2 Pedagogical initiatives in (A)L

As reported by Bunger (2017), the first institutionalised effort to promote communication about the way linguistics is taught was the journal *Innovations in Linguistics Education*. The journal was edited by Daniel Dinnsen of Indiana University starting from 1979; it published articles about the development of courses for other disciplines for which linguistic insights were valuable, attempting to vitalise conventional linguistics courses, with a focus on content, methods and materials, including how to introduce the core concepts of linguistic analysis to different student audiences. The journal was witness to one of the field's first pedagogical conferences, "The Teaching of Linguistics", held in New York in 1981. Despite its considerable modernity, it does not seem to have attracted sufficient attention from the community,

³⁷ Cf. the somewhat ambiguous term *educational linguistics*, used for studies on language teaching and for SoTL.

³⁸ Serbia is also known for attempts at introducing compulsory Serbian language courses in all undergraduate degrees, still focusing primarily on prescriptive rules (see e.g. Arsić, 2023).

³⁹ As briefly mentioned in subsection 3.3, there is a growing interest for the teaching of linguistics through L1 and L2 school classes. Pedagogical research from both areas, L1/L2 teaching and linguistics, will need to come together in this particularly sensitive venture, as large gaps between linguistic theory and school grammar are constantly being reported (see e.g. Van Rijt & Copen, 2017). Valuable work in the direction of bridging this gap has already been published (Sanz & Igoa, 2012; Trotzke & Kupisch, 2020; Whong et al., 2013), but the focus often falls outside schools, and complex theoretical frameworks such as generative linguistics are given more prominence than the development of theory-neutral approaches that would be more accessible to teachers, and ultimately learners (cf. Van Rijt & Copen, 2017).

as evidenced by an irregular pattern of publication, and its fairly short life, with the last issue appearing in 1991 without a successor.⁴⁰

Another historically important publication dedicated exclusively to the teaching of linguistics came with the PhD thesis by Petray (2004), titled *Changing linguistic pedagogy*. The author criticised linguistics' focus on research as superior to teaching, stating that this was reflected in the "apprentice/expert relationship" typically present in classrooms (where a student-centred approach would be desirable), and calling for more attention towards textbooks, asking their detailed analyses to replace traditional cursory reviews. Not too much later, *Teaching linguistics: Reflections on practice*, edited by Koenrad Kuiper in 2011, became the first volume entirely dedicated to the teaching practices specifically in the field of linguistics (as reported by Anderson et al., 2024). A welcome contribution with 18 chapters covering the core linguistic subdisciplines as well as additional topics such as postgraduate supervision, the volume narrates first-hand experiences of the authors; it is a collection of suggestions for best practices more than a SoTL collection, as student experience is not tackled in any empirical way (cf. Lichtman, 2012). The volume is nonetheless very important as a clear statement of interest for how linguistics is taught.

In 2012, an important milestone was that *Language* introduced a section dedicated to "Teaching Linguistics". It took some time for this section to gain prominence – the journal's publisher, the Linguistic Society of America, took stand to affirm the scholarly merit of SoTL research only ten years later (LSA, 2022). At the moment, the section is online only, and holds a relatively modest but growing number of papers; in addition, LSA introduced a Resource Hub with a section called *The Teaching Resources and Innovations in Linguistics Library* – TRILL, a journal-like venue containing peer reviewed evidence-based teaching resources.⁴¹ In parallel, a new dedicated journal, *Pedagogical Linguistics*, was started in Europe in 2020, published by John Benjamins and mostly dedicated to school-level teaching of linguistics, and to some extent to L2 teaching to adults.⁴² As mentioned above, the Societas Linguistica Europea also started engaging more with outreach and published a manifesto on linguistics in schools, further underlining somewhat of a geographical division in interest for teaching at university vs. school levels, with so far more attention to the former in North America, and to the latter in Europe. More locally, the Italian Linguistic Society provided an example of good practice with the 2019 edition of its annual conference dedicated to "Teaching linguistics: epistemological bases, methods, applications" (see Sansò, 2020).

⁴⁰ The *IULC Working Papers* reissued all articles originally published in *Innovations in Linguistics Education* in a series of special volumes (vol. 17, numbers 2-6); the articles are available in open access at <https://scholarworks.iu.edu/journals/index.php/iulcwp/issue/archive> (last accessed on 16 August 2025).

⁴¹ <https://resourcehub.lsadc.org/Channel/TRILL> (last accessed on 4 September 2025)

⁴² <https://benjamins.com/catalog/pl/board> (last accessed on 3 September 2025)

Edited volumes and individual papers dedicated to the teaching of linguistics would at this point already be difficult to list extensively (cf. Feldhausen, 2022, p. 3, for a useful initial listing), and (A)L seems willing to engage in SoTL more. The trend goes hand in hand with the language professions being heavily impacted by rapid developments in AI, with a consequent need to redefine target competences and study programmes, as well as with (A)L generally losing some of its interdisciplinary ground and some of the respect it once enjoyed. The next subsection tries to place linguistic SoTL in the broader perspective outlined in previous sections, summarising some points to focus on in (A)L in the coming years.

4.3 Some possible steps forward

Several main requirements appear recurrent and transversal to the topics covered in this paper. Some have already been summarised by Jackendoff (2007, p. 253):

“The most important challenges for linguistics in the coming years involve making better contact with colleagues, with other frameworks and subdisciplines within linguistics, with theories of meaning and conceptualization, with psycholinguistics, with theories of other domains of cognition, with neuroscience, and with education.”

The years since Jackendoff’s words have seen some of these challenges addressed, but the situation in linguistics is not radically different today, and is further complicated by the rise of artificial intelligence and ruleless language technologies. So which actions can be singled out as desired in order to move the field (fast) forward? The list below provides some suggestions specifically for teaching, alternating between more general and very concrete steps.⁴³

A possible action plan for enhancing the position of (applied) linguistics in contemporary academia and society through teaching:

Action 1: Defining a fundamental body of knowledge about language, as theory neutral and as non-technical as possible, to include in introductory courses in (applied) linguistics;

Action 2: Developing methods and strategies for presenting core knowledge about language in different disciplinary contexts, adapting to the needs and interests of the target audiences;

⁴³ Several actions mentioned here have already been called for by multiple authors; references are not reported in the text for ease of reading, see in particular Anderson et al. (2024); Feldhausen (2022); Lehecka & Östman (2022); Petray (2004); Spring et al. (2000); Taylor-Adams & Gunter (2024); Weninger & Andres (2007).

Action 3: Making sure students are exposed to more than one view of language, fostering tolerance and curiosity in dealing with competing theoretical approaches and interdisciplinarity;

Action 4: Developing exercises and problem sets that capture diverse languages and/or multiple perspectives on the same problem, promoting flexibility of analysis;

Action 5: Introducing in (applied) linguistics the core concepts and approaches from computational linguistics and computer science relevant for language processing;

Action 6: Systematically engaging in linguistic scholarship of teaching and learning, including classroom experimentation and analyses of curricula, syllabi and textbooks;

Action 7: Building a stronger network by forming special interest groups, organising scholarly events and performing outreach activities dedicated to pedagogical linguistic research;

Action 8: Collaborating in project applications and projects dedicated to different aspects of the teaching of (applied) linguistics;

Action 9: Developing training programmes for (future) lecturers in (applied) linguistics;

Action 10: Battling for teaching and teaching-related activities to become more and more systematically valued at the institutional level.

A trait implicitly present in most if not all listed items is the requirement for (applied) linguists to abandon the somewhat arrogant attitude towards other disciplines interested in language, and towards rival linguistic theories, letting go of insistence on a specific kind of rules and principles in all contexts, moving instead towards inclusivity and collaboration; to quote Jackendoff again, this equals to “inculcating the attitude that one is not in this field to score points off someone else, but rather to find out how language works” (2007, p. 255). Another cross-cutting dimension in the list is, somewhat more evidently, high appreciation of teaching. Some of the items reflect this through ideas about what could be improved in current pedagogical practices in linguistics, while others emerge from a less fortunate necessity – as underlined by Taylor-Adams & Gunter (2024), academics almost by definition face a tension between research and teaching duties, with research achievements valued more; (A)L appears to have additionally contributed to this internally (see Anderson et al., 2024; Liberman, 2007; Petray, 2004). In linguistics, work leading to more value assigned to teaching is therefore beneficial for students and lecturers alike. More generally, with teaching being the bridge to the next generation, and right now one growing up in extremely complex social and ecological circumstances, it appears more essential than ever to use all disciplinary teaching for developing problem-solving skills, flexibility of thought, and a spirit of collaboration with others.

5. CONCLUSION

A well-known line from George Bernard Shaw's *Man and Superman* states that "Those who can, do; those who can't, teach" (to which applied linguists jokingly add "those who can't teach, teach teachers"); the time seems ripe to challenge this view in (A)L. In the words of Feldhausen (2022, p. 1), "[l]inguists tend to underestimate their educational and societal role, but linguistics matters".

Countries and academic cultures differ, but it is universally true that (applied) linguistics is filled with passionate researchers working hard on language exploration, theory and methods development, and knowledge application. Many do an excellent job at teaching, but there is room for improvement, and we need to act on that. The world is changing, but rather than lamenting over AI taking away our and our students' jobs, we should as a community put the present situation to good use, embracing that linguistics is becoming more vocational, and that a broader, open-minded interdisciplinary perspective will help the field more than continued transfer of rigid disciplinary knowledge within narrow interested circles, divided on top of that in theoretical camps that still struggle to communicate with each other. We need to adapt our teaching accordingly, including not just new transversal skills, but also new ways to teach about language, all the while without forgetting to push others to change, by insisting on (at least) introductory linguistics courses in other areas working with language. Needless to say, most mentioned action points require a joint effort from the community, and many take time, but this should not become an excuse for not taking any action.

Lastly, instead of final words, I would like to offer some disclosure. First, this paper is much longer than initially intended, with occasional stream-of-consciousness narration; this is mostly because I had superficially assumed much less previous work to be available. Second, the range of topics tackled in the paper is rather broad, inevitably leading to some of them being covered rather sketchily; I can only commit to adding more depth and more empirical evidence in future writings. Third, I admit to being guilty of occasionally teaching courses not fully tailored to student needs, for lack of time (and sometimes will) to innovate; I address this paper to myself as much as to the community of fellow linguists.

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**(PRIMENJENA) LINGVISTIKA U DOBA VEŠTAČKE INTELIGENCIJE:
IZAZOVI I PRILIKE U NASTAVI**

Rezime

Diskusije o budućnosti (primenjene) lingvistike često uključuju njen odnos sa napretkom u domenu veštačke inteligencije i razvoja velikih jezičkih modela, koji uprkos neoslanjanju na lingvistička pravila postižu odlične rezultate u brojnim složenim jezičkim zadacima. U ovakvom kontekstu često se dovodi u pitanje ne samo opstanak jezičkih profesija, već i sam značaj tradicionalnih lingvističkih znanja i istraživanja. Rad se ovom širom problematikom bavi iz perspektive nastave lingvistike i obrazovanja budućih lingvista, ali i stručnjaka iz drugih oblasti koje se bave (i) jezikom, od psihologije do informatike. Polazeći od savremenih tehnologija, višedimenzionalne prirode jezika i interdisciplinarnosti nauke o jeziku, središnja tvrdnja rada jeste da pažnja koju jezičke tehnologije trenutno dobijaju u javnosti može i treba da se iskoristi za promociju univerzitetske nastave osnova lingvistike i izvan filološki orijentisanih studija, uz istovremeno delimično prilagođavanje pristupa nastavi i nastavnih sadržaja za buduće lingviste. Najзад, podvlači se kako bi unutar (primenjene) lingvistike uporedo trebalo u većoj meri podsticati empirijska pedagoška istraživanja posvećena tome kako studenti usvajaju znanja o jeziku i kakvi nastavni pristupi i materijali daju najbolje rezultate.

Ključne reči: interdisciplinarnost, nastava (primenjene) lingvistike, veštačka inteligencija, znanje o jeziku, naučno istraživanje nastave i učenja