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POLITICS, ASSISTANCE, AND AESTHETIC ASPECTS IN KEMPELEN'S SPEAKING MACHINE

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Abstract

The paper explores an important trajectory in the prehistory of mechanical and/or virtual assistance, focusing on Wolfgang von Kempelen's "speaking machine", which proved to be the most advanced of its kind for a long period, and, in a sense, can be seen as a precursor to natural-language user interfaces such as Siri. Four main contexts of Kempelen's invention are discussed. First, the linguistic-phonetic considerations that preceded the creation of the speaking machine. Second, the political implications of the argument in his treatise *Mechanismus der menschlichen Sprache* (1791), inspired by Enlightenment ideas and, further, shaped by the then lively discourse on the origin and evolution of language. Third, the role of his ideas on assistance and the forms of human-machine interaction in the concept of the envisioned tool. Finally, the sensory-aesthetic specificities of the speaking machine with regard both to its production and the operation principles: from the ghostly sound of its replicas to contemporary reflections in the contemporary art exhibition *Kempelen – Man in the Machine* (Budapest/Karlsruhe, 2007–2008).

Keywords: assistance, Enlightenment, interaction, Wolfgang von Kempelen, Christian Kratzenstein, speaking machine, speech synthesis

After more than two decades of experimenting with several versions of his speech machine, Wolfgang von Kempelen published his treatise on *The Mechanism of Human Speech* in 1791 (in a parallel German/French edition). This elaborates on three major themes. First, he presents an argument, typical of the second half of the 18th century, on the origin of language (connecting mainly to Johann Gottfried Herder's thoughts), followed by a phonetic instruction to the production of phonemes (Kempelen often calls these *letters*), and finally a description of his speaking machine – the latter telling the long and cumbersome process, slowed down by a series of wrong decisions, that led to the perfection of his invention. The machine itself consists of bellows, a wooden box called "windchest" attached to them, a reed pipe, and valves. Although the analogy between the machine and the anatomical apparatus of human voice articulation is obvious (e.g., the bellows are intended to replace the lungs), Kempelen's description makes it clear that, of the two possibilities documented by similar experiments at the time, the first option being that the machine is based on the recognition and reconstruction of human articulation, the second on the reproduction of acoustic impressions of human speech, he chose the latter (see on this Felderer 2002: 264–265). Indeed, one finds convincing arguments that the phonetic part of the treatise does not derive from the laws of human sound formation, but from mechanical principles attributed to the machine (Gessinger 1994: 585–586). This is why the machine (a wooden box with a pump) is not intended to take on human form (in contrast to his most famous invention, the "chess Turk", which he put on show in various European cities from 1783 to 1884, together with the speaking machine). Moreover, Kempelen was even indifferent to the fact that in the case of humans, airflow and speech use the one and same orifice. For technical reasons, he opted for two openings: "it would make no alteration to the speech of a person were he to have a hole in his chest, which was covered by a flap on

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the inside, and through which he drew in air" (Kempelen 2017: 559). However, again unlike the chess Turk, the speaking machine is not based on anthropological illusion: there is no man in the box.

In the following, some major contexts of Kempelen's invention will be discussed. First the paper looks at Kempelen's linguistic-phonetic considerations. Secondly, it discusses the political implications of the argument in his treatise *Mechanismus der menschlichen Sprache* (1791), inspired by Enlightenment ideas and, further, shaped by the then lively discourse on the origin and evolution of language. From these contexts follows also the question of his ideas on assistance: that is, to what extent can his ideas about the interaction between human speaker and machine be linked to the contemporary forms of such interactions. Since, according to the paper's thesis, aesthetic responses contribute in many ways to the contemporary understanding of such interactions, the concluding section aims to touch upon the sensory-aesthetic specificities of the speaking machine both in its contemporary context and in recent artistic reflections as presented in the contemporary art exhibition *Kempelen – Man in the Machine* (Budapest/Karlsruhe, 2007–2008).

However, it is important that the breakthrough came when Kempelen realised that he had to depart from the path taken by contemporary scholar Christian Kratzenstein. Although Kratzenstein had won a prize for his discoveries on the mechanical production of vowels, which in some respects surpassed Kempelen's insights (for details on Kratzenstein's mechanical conception see Gessinger 1994: 547–582), he did not manage to go beyond the five vowels, the reason for which, as Kempelen's experiments would show, was that he had insisted on separating the different sounds by means of different whistles of an organ-like construction. Kempelen first took the same direction, and then realised that human speech sounds could only be produced if they all were emitted by the very same articulation organ, as in the case of human anatomy (Kempelen 2017: 509).

The causes and consequences of this insight are of phonetic nature. For Kempelen, the greatest difficulty was not the production of individual sounds, but their combination into syllables or words, the fact that the extent of different sounds cannot be clearly marked off from one another – this is the same issue that led Ferdinand de Saussure, more than a century later, to the distinction between phonology and the acoustic materiality of phonetic articulation.[1] The issue of this distinction still haunts more recent discourses on phonology: according to some findings, segmentation cannot be considered a universal consequence of word recognition and speech comprehension (see, e.g., Morais–Kolinsky 1994). Herein lies the reason why it is important to privilege acoustic impressions over articulation, since, as Homer Dudley, creator of the Voder and Vocoder devices, who praised Kempelen as a forerunner of electronic speech synthesis, points out, Kempelen's machine really performs well "when given some clue beforehand" (Dudley–Tarnoczy 1950: 164), e.g., when the context of larger units, words is known. Kempelen's main concern was with consonants, where he must admit that the machine might "deceive" the ear. This underlines the childlike character of the machine, which is emphasised throughout the treatise: "the machine's childlike voice comes into play and one allows it to pass as a child, when it sometimes babbles, or replaces one letter with another" (Kempelen 2017: 595, 597).

Unsurprisingly, Kempelen's general linguistic theories, which question the thesis of the divine origin of language, focus on two principles: conventionality and universality. The first is proved by the sign language of so called "deaf-dumbs": "And herein lies the best proof that language is not inevitably endowed by the Creator, but rather that people can create it stepwise themselves. Because, if one can invent a language based on hand signs for the eye, there is no basis for believing that one could not also invent one based on tones for the ear, reproducing and building one as with the other" (73, 75). A language created without any human intervention would mean that language could exist without reason, which Kempelen refutes with a particularly telling analogy: "But what does it mean *to have a language before the development of reason*? Isn't that *speaking, before thought or reasoning*, words without understanding, like parrots?" (97) The question is highly

[1] "Even if all the movements made by the mouth and larynx in pronouncing a chain of sounds could be photographed, the observer would still be unable to single out the subdivisions in the series of articulatory movements; he would not know where one sound began and the next one ended" (Saussure 1983: 38).

relevant precisely in the context of a speaking machine, since it considers and rejects an option that is, in principle, implied in the production of speech by machines. A machine may be able to speak without reason, without the capacity of understanding. However, Kempelen's machine, as will be discussed, does not allow for such an isolation of the machine from the human, since the machine is captured more like an assemblage (see Pennycook 2018: 142–143) with its operator: e. g., it is the human ear, in a kind of acoustic feedback, that guarantees correct pronunciation, and it is the human hand that pumps the machine's lungs and adjusts the glottis.

However, deaf-mutes are a testimony not only to the conventionality of language, but also to its naturalness. Kempelen recalls that he was able to communicate with an unknown deaf-mute without knowing sign language, because the deaf-mute made himself understood through a "universal language" (71). Moreover, animals also might have a certain kind of language, and right at the beginning of the treatise Kempelen gives a quite funny transcription of a conversation with his dog (5, 7). Elsewhere, however, a man born deaf, who has not learned sign language, is likened to a "wild animal" in terms of "spiritual strength" (91). In other words, Kempelen does not make a clear decision. Advanced language is essentially conventional, a human product, but in the ability to have language, its universal, one might say natural, character is also reflected – even though this is expressed in the use of conventional language.

The assumption of the universality of language is crucial for Kempelen and his machine in several contexts. 1. The machine is polyglot in nature, speaking all languages – even if, as the thesis concludes, it does not speak different languages with equal perfection (German, because of its frequent consonant combinations, seems to be more difficult than French or Italian [623]). 2. If, as he points out in his reference to the universal language plan of his compatriot György Kalmár (see on this Hegedüs 2011), sign language serves as evidence for the universality of language, then this means that language can be visualised. This is essential to produce sounds through manual operations. 3. The example of the deaf-mute boy who reads lips proves that the "operational laws" of speech organs are also universal (Kempelen 2017:81). 4. Language is in principle accessible to all.

This universal concept of language also has political implications, of course. Kempelen's invention ideas were undoubtedly influenced by the Baroque fascination with mechanical games and riddles, but Enlightenment ideology is at least as significant. He received numerous commissions from the courts of monarchs influenced by Enlightenment, Maria Theresa, and later Joseph II, even if his relationship with the House of Habsburg eventually turned worse, probably for political reasons. The idea of a universal language can quite clearly be understood as the central principle of the political idea of giving a voice to all, including those who had previously been unable to express their political will. The speaking machine can be understood as a committed step towards a universal right to vote, a right to a public voice, since in all its aspects it serves the purpose of conveying what its user has to say, regardless of the latter's individual characteristics or disabilities (see on this Felderer 2002: 275–276). The late successors of Kempelen's machine, personal assistants based on natural language user interfaces, do not assume such social isolation of their users, but they still do serve to involve them as much as possible in the web of public communication and material environment. Thanks to the machine, anyone who has been excluded for whatever reason should be able to speak up in public space. It is striking that Kempelen's examples, as well as the metaphors he uses to describe the machine's voice, predominantly refer to members of society deprived of public discourse: deaf-mutes and children. It is as if, in this respect, Kempelen's idea of the speaking machine came close to the Rousseauian vision of the uncorrupted savage and thus to the assumption that the anthropological question of the nature of man can be answered by making those individuals speak who were previously unaffected by society. This question, in a curious twist in the political subtext of Kempelen's treatise, is in fact answered by a machine.

Of course, this implies, on the one hand, a certain impersonality that characterises the machine as an apparatus of political publicness (which fits in well with the administrative practices of enlightened absolutism). On the other hand, however, it allows precisely for personalised subjects (actually, rather semi-agents) entering the space of communication. In the last paragraph of Kempelen's treatise, the much-quoted scene of the machine's coming to word is described as a

repetition, but it is still about a speaking self: "Ich spreche ein jedes französisches oder italienisches Wort, das man mir vorsagt, auf der Stelle nach" (Kempelen 2017: 622–623).[2] *I speak* through the machine.

It is obvious that the machine was also intended as a kind of helping aid and was supposed to function as an early personal assistance device. This aspect is not unfamiliar in the context of an age when the first institutes dedicated to the education of the deaf-mutes were founded and is in line with the ideas behind Kempelen's further inventions (and with the contemporary fantasies about mechanical speech in general):[3] he designed a printing machine for the blind, and in the description of the speaking machine he refers several times to speech therapy aspects, e.g. in the preface, he expresses the hope that "a portion of those people who have a faulty pronunciation, might be cured of this by my guidance" (Kempelen 2017: 19). Nevertheless, the feedback process that determines the use of the machine has a missing link. Since the operator of the machine can produce the right sounds after hearing, that is, based on acoustic impressions, it is highly questionable how the deaf-mute user could find the right manoeuvres of sound production (see on this further Felderer 2002: 274 and Gessinger 1994: 597–600). Clearly, Kempelen's machine could not rely on the conditions of modern technologies of speech recognition and speech synthesis: there was no database of recorded speech available to perform phonetic transcription in speech-to-text transformation, and for text-to-speech transformation it could not rely on more (e.g., large language corpora) than observations of phonetic regularities. This is why the speaking machine is unable to function without the involvement and presence of the user, and, unlike Siri, Alexa and all the others, cannot communicate with partners (nor rely on deep learning processes) on its own.[4]

This, on the other hand, also suggests that Kempelen's machine apparently remains completely indifferent to its user. Its impersonality is also reflected in the fact that the machine itself is not anthropomorphised. Its only human trait (its voice) does not serve the illusion of an autonomous personality since it is intended to replace the voice of the user. This is in clear contrast to the speech synthesis programs that run personal assistants, which are available to the client in a personalised form: they have a name, can be addressed or even must be spoken to and can be assigned a personalised tone and, of course, different languages. On the other hand, Kempelen's machine is not yet entirely impersonal, since the way it speaks is ultimately based on close interaction with its user, which extends not only to the acoustic dimension but also to tactile contact. However, it does not store and "learn" from the experience of interaction, in contrast to digital assistants. It is amusing that the Apple website felt it necessary to stress in the privacy notice that the assistant remains indifferent to its user. "Siri learns what you need. Not who you are."[5] Of course, there might be doubts here.

While Siri carries the promise of multitasking and primarily relieves texting hands of their burden, Kempelen's machine occupies precisely the hands. It is interesting in this respect that, from the evolutionary perspective of the emergence of language, Kempelen's machine seems to react to a blocked process. André Leroi-Gourhan has suggested a close link between the freeing of hands or of the mouth, which follow from bipedalism, and the emergence of language: one of the preconditions for language is that the mouth does not have to be used as a mechanical tool (e.g., as a claw) and that certain tasks are taken over by the hands (see Leroi-Gourhan 1993: 89, 244). Kempelen's machine ends up with a mechanical mouth: here, the mouth becomes a tool again, and

[2] Such a reading of the sentence goes lost in the English translation cited here: "I can repeat any French or Italian word that one gives me on the spot."

[3] The mathematician Leonhard Euler, for example, hoped that such machines would improve the efficiency of public speaking: "Die Prediger und Redner, deren Stimme nicht stark oder nicht angenehm genug wäre, könnten alsdann ihre Predigten und Reden auf einer solchen Maschine spielen, so wie jetzt die Organisten musikalische Stücke spielen" (quoted by Gessinger 1994: 525).

[4] However, contemporary sources show that the machine was able to give the illusionary impression that it speaks entirely without any human contribution, see Brackhane 2017: CVII.

[5] https://www.apple.com/siri/

the machine makes use of the hands – in this way, the machine testifies to this evolutionary pattern in a negative way. That means that the support capacity does not extend to all aspects of Kempelen's machine

From this point of view, the question of the aesthetic aspects implied by the machine can also be interesting. As mentioned above, Kempelen refrained from a consistent anthropomorphisation for reasons of technical necessity. While he adopts certain features of human sound articulation, he does not seek to anthropomorphise the appearance of his machine in any way – in contrast to the chess Turk, which attempted to distract attention from the real human being hidden in the machine by using a life-size human figure. The speaking machine neither hides a human being nor bears human features. But there is still some similarity. Kempelen's machine is covered by a box, which he himself says is "not at all necessary for speech", but which was intended to protect the machine from dust and to prevent sound scattering (Kempelen 2017: 565). At the same time, this box also covered the hands while operating the machine – in a sense, it evoked the same illusion on which the pseudo-automatic of the "chess Turk" was based. It is interesting that it is the hands that should remain hidden.

The 2007 exhibition *Kempelen – Man in the Machine* shown at the Kunsthalle Budapest and the ZKM Karlsruhe featured contemporary artists reflecting on Kempelen's inventions – mostly the "chess Turk", but there were also number of artists who dealt with the speaking machine instead. Not surprisingly, these works show that the issues raised by the machine are also a challenge for contemporary technology. On the other hand, they brought to the fore those aspects of the human-machine relationship (e.g., anatomical equivalence and anthropomorphisation, and the role of the hand) that have been discussed above. Several installations use the technology of electronic speech synthesis. Ken Feingold's 2007 computer installation *Box of Men* generated a real-time dialogue between six virtual ventriloquist puppets. The program's unique feature is that it has attributed "personalities" to the puppets, who expressed even their opinions about each other's feelings and thoughts. In other words, the software compensates for the shortcoming of Kempelen's machine in that it could not personify the artificial voice – the machine is a ventriloquist, too, but it can only imitate the discourse of the human with whom it directly interacts. The visual appearance of the puppets (in which the open or closed position of mouths plays a major role) is reminiscent, further, of the illusion of the "chess Turk". Kathrin von Maltzahn's series of watercolour paintings entitled *Instructions for the Most Perfect Pronunciation of the Hungarian Language* (1998) follows the opposite path. The pictures represent the mouth while pronouncing Hungarian sounds, detached from the broader visual and corporal context of the body or face. The isolated images stand for Kempelen's phonetic aspiration to find a separate position for each "letter" using the machine – a phonological abstraction of speech, which here, as in Kempelen's work, also presupposes the visualisation of language. While these images depict the organ of sound articulation in its bodily reality, that is, not as a puppet, the detachment from the body and the abstract moment of sound production still alienates the anatomical mouth – it is at least as uncanny as if the images were of artificial mouths. The mouth as a sound-producing organ appears to some extent as a machine in these images. Furthermore, the absence of any textual elements in the "instructions" evokes the option of lip reading, which played an important role in Kempelen's reflections on language. One could, among others, refer to his experience of witnessing a deaf-mute boy being able to write down the text read to him after reading it from the lips: "The boy wrote identically word for word on the board. This shows, that our speech apparatus always has the same operational laws, that each sound is distinguished from the others by the position of this apparatus, and that one can by precise and repeated observation of oneself and others, finally distinguish, how nature makes use of manifold means to bring forth what is basically a simple sound" (81).

Martin Riches's sound installation *The Talking Machine* (1989–1991) is an archaeological intervention in the history of technology: it starts from an insight not unlike the one reported by Kempelen ("While I was voicing the pipes for a mechanical organ I noticed that when they were playing incorrectly they would sometimes make sounds quite similar to human speech."), but it leads him down a path that Kempelen finally did not choose (Serexhe–Weibel (eds.) 2007: 68, cf.

Kempelen 2017: 399, 401). Riches's talking machine, which the artist calls an "acoustic speech synthesiser", is basically a computer-controlled organ with 32 pipes, each pipe corresponding to a distinct sound. Each pipe was designed according to the measurements of X-ray photographs taken of a person speaking – as a result, a rival to Kempelen's machine, namely Kratzenstein's vowel organ, of which there is no known contemporary representation, is realised in computer-steered version.

But there is also an example of a computer program simulating the principle of Kempelen's machine. Michael Markert's sound installation *kII (Kempelen 2.0)* (2007) is "a voicetopological interface for gestural navigation in linguistic space" (Serexhe – Weibel [eds.] 2007: 74). This device creates an equivalence between the hand and the organs of speech articulation through the sensory measurement of hand movements. The hand, so to speak, takes over the task of sound production, made possible by the fact that its positions correspond through the interface to those of the latter. This device envisages a sign language that provides a translation between gestural language and articulated speech through an iconic correspondence rather than a conventional one. While in Kempelen's machine the hand is supposed to control the artificial speech organs that produce sound, here this translation is rendered superfluous by a kind of immediacy, the hand does not have to interact or come into sensual contact with the machine. In fact, of course, there is no absolute immediacy: it would be more accurate to say that the machine is virtualised, since there is obviously still a mediating transformation between the machine and speech: this is the interface itself. Only this allows the hand to become mouth.

Finally, another approach to the idea of immediacy between body and machine is presented in Georg Winter's installation *Mobile Harajuku* (2007), which is based on the technology of mobile telephony and its impact on the experience of the relationship between man and his environment, i.e., the radical separation of the message conveyed in speech from the environment in which the event of speech takes place. The device responds to this experience by promising to recover a specific immediacy by eliminating the distance between the speaking body and the message. As the device is directly controlled by the mouth (thus implicitly carrying or reflecting on the utopistic promise of the most direct communication possible), in a sense the basic scheme of the "chess Turk" gets reversed: here it is not the man in the machine, but the machine in the man, so to speak. The device, which promises to eliminate the externalisation of speech, raises the possibility of a direct (self-)expression of the articulation apparatus, but at the same time highlights the fact that this immediacy is produced by machines. This presents a contradictory account of the extent to which Kempelen's invention could have been a precursor to algorithmic speech synthesis. As some of the artworks discussed above have shown, the analogy between the operations of the machine and human voice production is not self-evident (e.g., it requires the intervention of digital data analysis), and the speaking machine can at most be related to contemporary language technologies within the framework of a kind of media archaeology. On the other hand, it establishes a perspective that reveals the non-human, e.g., machine-like factors of human speech. This contradiction is not unknown in linguistic theory. Saussure, who wanted to liberate the phonetic reality of sound formation from the regime of the alphabet, as his earlier quoted statement attests,[6] dreamt of devices that provide direct access to language, e.g., by "filming" the movements of mouth and larynx. For Kempelen too, the phonetic reality of human language was revealed in the design of a machine. There is indeed machine in the man.

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[6] See note 1.

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POLITICAL PERSONALISATION IN HUNGARIAN STATE-OF-THE-NATION SPEECHES

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Abstract

The examination of political personalisation has recently come to the fore in the international literature as a result of the general finding that politicians increasingly highlight their own personality instead of political groups, i.e. politics is becoming increasingly person-centred (Rahat–Kenig 2018; Szabó 2020, 2021, 2022a, 2022b). The study reflects on this issue by adopting the background assumptions of functional pragmatics, interpreting the phenomenon of personalisation within the scope of social deixis (Tátrai 2017). It is a linguistic tool for the social construction of power relations created within the framework of public discourses, which is created primarily using first-person linguistic forms (Ballagó 2024; Liu 2022). However, it is not only the ratio of 1Sg and 1Pl that is decisive, but it is also important what function person-marking forms fulfil in the discourse, determined by the context: for example, in the case of 1Pl, at what distance are the persons who can be interpreted as a group from the speaker (cf. Szabó 2022a, 2022b), and with 1Sg, to what extent forms appear in a discourse-organizing, metapragmatic function. The investigation is based on four Hungarian state-of-the-nation speeches, 10 years apart from the same two leading political actors. After the transcription and annotation, the analysis identified the functions of the person-marking utterances based on the context, and distinguished gradualism accordingly. The main research question was the following: To what extent do first-person singular and first-person plural person markers compare to each other in these Hungarian politicians' state-of-the-nation addresses over the interval of roughly 10 years? The qualitative examination carried out with detailed analysis shows that the level of personalisation is relatively low in all four speeches, and no growth can be detected over time. This can be explained by the speech genre as a genre-specific characteristic.

Keywords: political personalisation, functional pragmatics, social deixis, first-person singular and first-person plural elements, state-of-the-nation speeches

1. Introduction

Recent years have seen an upsurge of interest in the study of political personalisation in both Hungarian and international research. One reason behind this is the recognition that political personalities, rather than political groups, increasingly receive the spotlight of attention in the public sphere, i.e. that politics is becoming increasingly person-centric (Rahat–Kenig 2018; Szabó 2020, 2021, 2022a, 2022b). Adopting the background assumptions of functional pragmatics (Versucheren 1999; Tátrai 2017), the paper engages with this ongoing academic discourse by interpreting personalisation, primarily by first-person linguistic forms, in the context of social deixis as a linguistic device for the social construal of power relations created through public discourses. The empirical basis of the study consists of four state-of-the-nation speeches, two each with in interval of 10 years from two leading Hungarian political actors. The state-of-the-nation speeches were annotated for 1SG and 1PL forms. The subsequent analysis of person-marking utterances then proceeded to identify functions in a context-sensitive manner.

First, within the theoretical background assumptions (2.), I discuss political communication in general and political personalisation in particular, then turn to the issue of social deixis, focusing

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primarily on the functioning of the first-person singular and plural. Next, I put the material and method (3.), and the research questions (4.) into focus. Then I present the results, analysing in detail the realisations of one of the speeches, making the methodology of the analysis explicit, and finally comparing the data of the individual speeches (5.). The study concludes with a summary (6.).[1]

2. Theoretical background

2.1. Political communication and political personalisation

Political communication is a complex and dynamic process, wherein political actors and the public exchange verbal or written messages and information of various political content through various media platforms. Mazzoleni's brief definition of political communication is the following: "...the exchange and confrontation of content of public interest and political content created by the political system and citizens-voters" (2002: 28). Although the practice of political communication dates to ancient times — it was already present in the political systems and decision-making processes of ancient Greece and the Roman Empire — its definition and analysis as an academic discipline began mainly in the mid-20th century, after World War II. Mazzoleni, who characterises political communication as a process (public-dialogue model), emphasises that different approaches cannot fully cover the complexity of political communication (2002: 28). The purpose of political communication is to influence people's thinking, opinions, and behaviour (to inform, persuade, manipulate, control, exercise power, etc.), so it fundamentally requires political publicity, and its actors are the political system, the media, and the electorate. These forms of communication include speeches, election campaigns, political advertisements, press conferences, political debates, and interactive platforms offered by social media. A characteristic feature of political communication today is its two-way nature, which means that not only do political actors have the opportunity to convey their messages to the public, but the public also follows and responds to them, with public opinion feedback also forming part of this increasingly dynamic communication process.

The issue of political personalisation is essentially a part of political communication. When considering political personalisation as a political science issue, there are several interpretations of the phenomenon in the literature. On the one hand, political personalisation can be a process whereby the leader emerges from the ranks of party politicians and begins to represent the party in the eyes of the electorate (cf. Papp 2013: 37–38). On the other hand, personalisation can also refer to the expression of the phenomenon whereby individual politicians develop a personal image that distinguishes them from their party or from other politicians in their party (cf. Karvonen 2004; Papp 2013: 38). It is therefore a process whereby political leaders are becoming increasingly dominant in political discourse and in the minds of the electorate, and as a result, individual political personalities are becoming more influential in the functioning of the political system, thus increasing the role of individual leaders in political decision-making and communication processes (cf. Farkas–Bene 2020). The focus on the individual rather than on political groups is becoming more visible in politicians' messages, i.e. politics is becoming increasingly person-centred (Rahat–Kenig 2018; Szabó 2020, 2021, 2022a, 2022b; Horváth 2023).

The literature links the personalisation of politics to three main phenomena: 1. the individualisation of society, 2. mediatisation and 3. the changing functioning of political parties (cf. Szabó 2022a). Individualisation is a phenomenon whereby both politicians and voters increasingly define themselves as individuals rather than as members of a group, and this also influences their electoral preferences (cf. Rahat–Kenig 2018). Mediatisation refers to the fact that politics is increasingly dependent on the media and its influence (cf. Mazzoleni–Schulz 1999; Merkovity 2008), with social media platforms playing an increasingly important role in this regard in the first half of the 21st century. The popularity of social media also represents a new platform in the sense that it can capture the attention of large numbers of voters directly and continuously (cf. Merkovity 2018). The

[1] The study is a further developed version of my analysis published in Hungarian (Laczkó 2025).

consequences of individualisation and mediatisation are that political parties and individual politicians are adopting increasingly personalised communication strategies, thus reinforcing the person-centredness of politics.

There are several factors behind the phenomenon of political personalisation (cf. Szabó–Burai 2019), including:

- The rise of the role of individual political leaders.
- In parallel, the relative decline in the role of political parties.
- The rise of emotional components and the personalisation of political communication also play an important role.

The personalisation of political discourse thus refers to the phenomenon of increasingly personal content and information in the discourses, either through the primacy of the individual over the group or through the increasing private content shared by politicians in public life.

2.2. Social deixis

The phenomenon of political personalisation also has linguistic implications. The linguistic approach to the study is based on the theoretical framework of functional social pragmatics, which characterises the phenomenon of personalisation as an intersubjective direction of attention that interprets linguistic activity as an essentially intersubjective action (cf. Tátrai 2017). Personal construing, according to this view, is the intersubjective sociocultural relation of the speaker to his or her discourse partner, i.e. the speaker makes his utterance accessible by making it linguistically reflective from his own sociocultural situation, i.e., from his interpersonal positioning in relation to his discourse partner (cf. Ballagó 2024). In this framework, personalisation can be understood as being graded in the way in which the intersubjective sociocultural relation of the speaker to his discourse partner is construed. As part of this, political personalisation examines this issue in the context of the shaping of social relations, interpreting it as a linguistic tool for the social construction of power relations in public discourse. It is worth examining this phenomenon essentially from the point of view of deixis, and particularly of social deixis, since the question of personalisation is profiled through the first-person singular and plural elements in deictic operation (cf. Liu 2022; Szabó 2022a, 2022b).

According to the functional social pragmatic approach, deixis is a comprehensive term for the linguistic operations that designate context-dependent reference points (Brisard 2021: 344–358) from the physical and social world of the intersubjective context of shared attention (cf. Tomasello 2001; Croft 2009) for the observation and understanding of the spatial, temporal and socio-cultural relations of the so-called referential scene (Tátrai 2017: 899–1058, 2022: 19–52). Context in this framework is understood as an intersubjective set of relations in a dynamic process of meaning forming, which includes the physical world of the discourse (space and time), the social world of the discourse, and the mental world of its participants (cf. Tátrai 2017: 929–931). The operation of social deixis thus asserts the roles of the participants in a speech event through person deixis, anchoring them in the discourse world essentially through person marking, as well as the sociocultural attitudes of the participants, which is interpreted as social attitude deixis (Tátrai 2017: 972–974, 2025: 62–65).

The first-person singular is the central element of person deixis, the fundamental point of interpersonal orientation of the context-dependent vantage point, the deictic marker of the speaker. The first-person singular makes the speaker objectified. An event or thing is constructed objectively from the speaker's point of view when it is made observable as an object of attention through linguistic expressions, i.e., it reflects on itself as the constructor of discourse, meaning that the speaker becomes linguistically explicable through personal designation (cf. Langacker 2006, 2008; Kugler 2013, 2015). The objectivised construction of the speaker is based on the ability of the self to understand and linguistically represent itself (make itself observable to others) (cf. Tolcsvai Nagy 2012: 103).

The first-person plural denotes heterogeneous plurality, with the central element being the "I". It metonymically constructs the speaker and/or the recipient as a group, as well as the 3rd person actor(s) outside the joint attentional scene and is also suitable for marking attitude by deictic projection (see Tátrai 2017: 976–980; Laczkó 2021a). Accordingly, inclusive, exclusive and virtual uses can be distinguished. In the inclusive use, the first-person plural includes the recipient in addition to the speaker, as well as an additional third person actor or actors. The exclusive use does not include the recipient; it constructs the third person actor or actors as a group with the speaker (cf. Laczkó–Tátrai 2015). Virtual use, on the other hand, is a case of deictic projection, i.e. a shift of the perspective, whose three central patterns can be identified as follows: the first person plural (1) instead of the first person singular, (2) instead of the second person singular, (3) instead of the third person is closely related to attitude marking (cf. Laczkó 2024; also Versucheren 1999; Tátrai 2017, 2025). Accordingly, the first-person plural is either metonymically construed as referring to a group with the speaker and the other persons, or it is used virtually, to indicate responsibility, solidarity, and identification.

3. Material and method

To examine political personalisation, I analysed four state-of-the-nation speeches given by two Hungarian political figures as case studies:

1. Ferenc Gyurcsány 2012 (1 hour 25 minutes, 6455 words)
2. Ferenc Gyurcsány 2022 (41 minutes, 4179 words)
3. Viktor Orbán 2010 (49 minutes, 5349 words)
4. Viktor Orbán 2023 (50 minutes, 4521)

(Sources: YouTube, Indavideo, Facebook)

The state-of-the-nation speech was introduced in Hungary by Viktor Orbán in 1999 following the American patterns.[2] In the 26 years since then, it has become an important political event and an essential form of political communication. It is a tool for leading politicians to summarise the political, economic and social events of the previous year and to present future and goals of the political party. These speeches offer an opportunity for political leaders to address the people directly, to assess their own work, to reflect on events, to express their attitudes, to formulate their views and to outline future possibilities. The protagonist of these events is a politician who is considered in political communication literature as a leader or messiah-type "actor" (cf. Kiss 2019: 65–115), a person who is treated as a charismatic person by his "followers", and at the time of the speeches in Hungary, the Prime Minister and Ferenc Gyurcsány were such leader-type politicians.[3]

My aim was to compare two speeches each of the two leading political actors at the time of the speeches, in terms of the implementation and extent of personalisation. This gives the opportunity to see, on the one hand, whether the practice of personalisation has changed in relation to the politician in question and, on the other hand, to compare the speeches of the two actors in this respect.

The texts of the speeches were transcribed into separate Word documents. First and second person marking constructions and linguistic forms of addresses were annotated separately in each speech. The table shows the distribution of the data.

[2] Cf. https://mediakutato.hu/cikk/2022_03_osz_tel/05_orban_aldozatai.pdf

[3] Viktor Orbán has been Prime Minister of Hungary since 2010 and is still a well-known figure in international politics. Ferenc Gyucsány was Prime Minister of Hungary between 2004 and 2009 and became part of the opposition in 2010. From 2007 to 2009, he was president of the Hungarian Socialist Party, and from 2010, he was president and faction leader of his party's Democratic Coalition Platform, which became the Democratic Coalition party in 2011 under his leadership, until his resignation in 2025. During this time, he became an iconic figure of the left-wing opposition, so the ruling power construed him as their main enemy.

	Gyurcsány 2012	Gyurcsány 2022	Orbán 2010	Orbán 2023
Sg1.	128	112	85	32
Pl1.	166	154	190	244
Sg2.	3	1	3	17
Pl2.	3	0	0	1
Forms of addresses	18	39	49	38

Table 1. The distribution of the data

I have 1283 linguistic data in total. Of these, now the focus of the analysis is on the first-person singular and the first-person plural forms,[4] for a total of 1111 data. The analysis is qualitative; I use numerical data only to show the tendencies.

4. Research questions and hypotheses

Q1. What is the proportion of the Sg1 and Pl1 elements in the speeches of the two politicians in relation to each other and over a period of about 10 years?

Q2. How does the use of these person-marking elements in the texts show the personalisation and the identification attitude of the two politicians compared to each other and over a period of about 10 years?

H1. In all four speeches, the first-person plural numerically outnumbers the first-person singular due to the genre of the state-of-the-nation speech, primarily constructing the leader and his party as a community, reporting on the events, actions and achievements of the year.

H2. Over time, the personalisation of the speeches intensifies, as both politicians have remained in the same position over the years, and this is also reflected in the pattern of Sg1 and Pl1 elements.

5. Results

In the presentation of the results, I detail the analytical methodology developed, focusing on Ferenc Gyurcsány's 2012 speech. The analysis was the same for all four state-of-the-nation speeches.

Among the elements indicating the first person anchoring, the first person singular can be approached in terms of political personification from the aspect that the representation of the "I" signifies a kind of commitment to the message conveyed by the politician (Beard 2000; Szabó 2022a), i.e. it can signify a kind of real or apparent assumption of responsibility with regard to the topic, the content, and the opinion. On the other hand, the first-person plural can indicate that the politician is speaking on behalf of a group, and that he or she is showing authority, but also communion with the group (cf. Pennycook 1994; Szabó 2022a). It therefore means that the politician is a member of the group and has the right to speak on behalf of the group.

5.1. First-person singular

The proportion of the first-person singular and plural forms in the speech is as follows: 128 Sg1 and 166 Pl1 elements were annotated. The difference between singular and plural forms is only 38. If we only consider the high number of singular forms, it seems that in this speech the speaker is strongly constructing himself as an individual. To confirm this, however, it is necessary to analyse

[4] In Hungarian, person is marked by personal pronouns and inflectional suffixes. Inflectional suffixes appear in verbal constructions and possessive structures in agreement with personal pronouns. As a result, pronoun elements do not necessarily appear in the subject and possessor positions. During the analysis, if both the pronoun and the inflectional suffix appeared within a single construction in the sentence, I counted them as one. For example: ***én*** *vezet**em** az országot* ('I am leading the country'), *az **én** ország**om*** ('my country').

the discursive role of the first-person singular. First person forms typically occur in verb structures and possessive structures.

The possessive structures (11) appear in the speech in two functions. Roughly half of them (5) are found at the point in the text where the speaker uses the moral example of his own family, evoking positive emotions in the listeners.

(1) Hányszor és hányszor hallottuk, hallottuk szüleinktől, én magam is **édesanyámtól, édesapámtól,** hogy hát **fiam** az élet ilyen, de majd legalább neked jobb lesz. **Én anyám** azt szokta mondani, hogy azért gürcöl, hogy nektek jobb legyen, és gyanítom, hogy a szülők nagy többsége ezt mondja. Hogy odaadnám a **szemem** világát is értetek, gyerekeinkért, unokáinkért, ami egy fantasztikus dolog.

'How many times and how many times we heard from our parents, and I from **my mother and father**, that this is life, **my son**, but at least it will be better for you. **My mother** used to tell me that she works hard so that it will be better for you, and I suspect that most parents say the same.'

This point of the speech can be considered as highly personalised, since the politician is giving an insight into his own personal sphere, sharing personal content. The other possessive structures of the text, however, have a much more reflective function on the discourse.

(2) és akkor most ezen a ponton a **példázataim** a Magyarországon meghatározó szerepben lévő keresztény egyházakhoz fognak szólni

'and now at this point **my examples** will be addressed to the Christian churches that are dominant in Hungary'

(3) Profán a példa. Nem is a **magam találmánya,** bár a múlt héten egy éjszakai parlamenti vitában már használtam.

'The example is profane. It is not one of **my own inventions**, although I used it in a late-night parliamentary debate last week.'

In the examples, the speaker is clearly reflecting on his own speech activity. In example (2) the speaker reflects on the use of parables in his speech, and in example (3) he reflects on the fact that the example given is not his own. It can therefore be seen that the speaker only highlights himself in possessive constructions in a single section of the text, and even then, as an example and in a positive context.

In the case of the verbal constructions, there are two instances where the speaker uses the first-person singular while addressing the audience directly, and this is not accompanied by a speech act of greeting or saying goodbye.

(4) De ezernyi részlet **(még itt vagyok),** minden bizonnyal lehetett volna arról tárgyalni…

'But with thousands of details **(I'm still here)**, it certainly could have been discussed…'

(5) **Nézek körbe ebben a teremben**, és **látok olyan tanárnőt**, akinek Budapesten nincsen munkája másfél évben, másfél éve...

'**I am looking around** this hall and **I can see** a teacher who hasn't had a job in Budapest for a year and a half…'

In (4), the speaker is interrupted by a listener, that is why the speaker interrupts his speech and addresses the listener directly. After the interruption, he leaves the sentence unfinished and restarts what he was saying. Although oratorical speech as a genre presupposes one-way direct

communication, in this case the speaker breaks off his speech due to the disruptive factor and responds to the interrupter. In (5), he deictically includes the specific place and someone in the audience, while elaborately construing his visual perception with the verbs *look* and *see*.

The first-person singular verb constructions in the speech have a metapragmatic function in the highest proportion (as we have seen, examples 2 and 3 from the possessive adjective examples can also be included here). The concept of metapragmatic awareness refers to the reflexive attitude of discourse participants towards linguistic activity and the dynamic meaning-construction that takes place within it (see Versucheren 1999; Tátrai 2017: 1045–1053). The speakers can reflect on their own, the other's, or other third persons' speaking and receptive activities, and they can also reflect on the ongoing discourse and its organisation. All this means that participants can relate reflexively to various linguistic representations and the associated social cognitive processes and sociocultural expectations. Metapragmatic awareness has observable linguistic traces, which we call metapragmatic signals. However, metapragmatic awareness does not simply mean the use of linguistic signals, but rather the participants' varying degrees of reflexive attitude towards their shared linguistic activity, the dynamic meaning-construction to which the speaker draws attention with these signals (cf. Laczkó 2021b).

In this speech, constructions that refer to the speaker's speech activity predominate, and these appear with verb constructions that represent saying in a relatively highly elaborated way.

(6) **Mindamiről eddig beszéltem,** lényegében meghatározza mindazt, ami Magyarországon az elmúlt 2 évben történt és történik.

'Everything **I have said** so far essentially defines everything that has happened and is happening in Hungary in the last 2 years.'

(7) **Arról nem is beszélek,** hogy a szóban forgó nemzetközi vállalat ottani első számú vezetője, Magyarország egyik korábbi miniszterelnöke, az olyan valaki csöngetett be a magyar miniszterelnökhöz, aki, ha úgy tetszik, kollégája.

'**I'm not even talking about** the fact that the number one executive of the international company in question there, one of Hungary's former prime ministers, is the person who rang the bell to the present Hungarian prime minister, who is, if you like, a colleague of his.'

(8) **Nem mondom én azt,** hogy szótlanul kell nézni, hogyha egy nagy nemzetközi áruházlánc visszaél hatalmával.

'**I am not saying** that we should stand by and watch a large international supermarket chain abuse its power.'

(9) **Csendesen és visszafogottan mondom,** hogy ezt egy alávaló dolognak gondolom.

'**I say quietly and reservedly** that I think it is a despicable thing to do.'

(10) Én e kormányzati ciklus egyik legpusztítóbb, legellentmondásosabb, **nem akarok ennél brutálisabb jelzőt használni,** intézkedéssorozatát abban látom…

'I see one of the most destructive, controversial, and **I will not use a more brutal adjective**, series of measures of this government's term of office as…'

The most used verbs are *say* and *talk/speak* in first-person singular. In example (6), the past tense verb form (*beszéltem* 'I have said') reflects on what the speaker has said previously, with a discourse-deictic, anaphoric pronoun (*eddig* 'so far'), while in example (7), the reflection is directed at the current discourse in a specifically negative form. The verb *mondom* ('I am saying') in example (8) is also in the negative form, with the personal pronoun *én* ('I') appearing after the verb, while in example (9), the manner of the speech activity is elaborated: *csendesen és visszafogottan* ('quietly

and reservedly'). In example (10), the speaker also elaborates on linguistic construal as the object of reflection.

Equally numerous are the first-person singular forms that refer to the speaker's perception, opinion, thinking, these are mainly the so-called cognitive verbs.

(11) **Képtelen vagyok megérteni**.
'**I am unable to understand.**'

(12) **én azt gondolom,** azonosak a jogok, azonosak a kötelességek, azonos a felelősség
'**I think** the rights are the same, the duties are the same, the responsibilities are the same'

(13) Nem érti, nem érti, mert ő még, **úgy látom,** hogy mindig azt hiszi, hogy a politikai hatalom birtokában fel lehet morzsolni a köztársaságpárti Magyarországot
'He doesn't understand, he doesn't understand, because he still thinks, **as I see**, that with political power the republican Hungary can be broken up'

(14) **Gyanítom,** abban több volt a mi hibánk, mint az ő erénye.
'**I suspect** that it was our fault and not his virtue.'

(15) **Nem tudom,** hogy ők hogyan gondolják.
'**I don't know** how they think about it.'

The primary function of these verb constructions is therefore to organise the discourse. They are mainly characteristic of spoken conversations and not of written, edited texts. In this speech, their presence is not justified by the speaker's desire to put himself into focus or to share personal content, but by the fact that he speaks freely. This is partly related to the fact that a significant proportion of the verbs are in the present tense (105 out of 117). In addition, verbal constructions also include speech acts in which the first-person singular is very unobtrusive, as they are practised, everyday forms, such as for example *thank you very much*. In comparison, the number of constructions in which the speaker is foregrounded is very low. For example:

(16) **Én** egyébként **nagyon szeretem** a monokróm festészetet.
'I really like monochrome painting.'

(17) Nem akarok cinikus lenni, de bár így lenne, **amennyire ismerem őt,** hát ennek nincsen nagy valószínűsége.
'I don't want to be cynical, but even if I did, **as far as I know him**, it's not very likely.'

In (16) he talks about his own individual taste, and in (17) he talks about his own knowledge of Prime Minister Viktor Orbán, so this shows the foregrounding of his own cognitive functioning.

5.2. First-person plural

Among the first-person plural forms in the speech, there are 127 verbal and 39 possessive constructions. Compared to the singular data, it is also striking that the speaker uses possessive structures to a greater extent in the plural, and this is obviously because speech constructs possessive relations from the perspective of group formation, especially from the perspective of the nation or the party as a group, rather than from his own more subjective perspective.

(18) Könnyű lenne **a dolgunk,** ha csak azon kell törni **a fejünket**, hogy előbb-utóbb politikai vereséget kellene mérni Orbán kormányára.

'**Our task** would be easier if we only had to trouble **our heads** with the fact that sooner or later Orbán's government should be politically defeated.'

(19) Még mielőtt azt hinnék jobb oldali **kritikusaink,** hogy ez valami magyar blődli…

'Before **our** right-wing **critics** think that this is some Hungarian blunder...'

(20) Ez a Magyarország azt gondolja, hogy bár közösek vagyunk **történelmünkben, kultúránkban, nyelvünkben**

'Hungarian people think that although we share history, culture, language… [lit. **our history, our culture, our language**]'

In example (18), the first-person plural possessive construction reflects the attitude of the party as a group, metonymically reflecting the mental functioning of this group, in example (19) it conceptualises the political group opposing the party. And in example (20), it is clearly about the nation as a group, thus representing a broader set than the previous ones.

In verb constructions, the speaker uses less discourse organising elements than in the first-person singular; he rather displays events, opinions and attitudes related to the group (examples (21)–(23)):

(21) majdnem 20 évvel ezelőtt 1992-ben megrepedt az addig egységesnek, egésznek és erősnek hitt köztársaságpárti politikai közösség, megjelent valami új, egy régi-új gondolat, egy régi-új eszme vagy olyasmi, amivel **azt hittük,** hogy már **leszámoltunk,** vagy **túl vagyunk rajta**.

'Almost 20 years ago in 1992, the republican political community, which had been thought to be united, whole and strong, was shattered, something new, an old-new idea, an old-new thought or something came which **we thought we had dealt with, or we had overcome.**'

(22) **mi magunkat** köztársaságpárti hazafiaknak, köztársaságpárti magyaroknak **tartjuk.**

'**We consider ourselves** republican patriots, republican Hungarians.'

(23) **Mi 2010 után azért küzdtünk, küzdöttünk,** hogy Magyarországon legyen egy erős, nagy, balközép demokratikus politikánk.

'After 2010, **we fought and fought** to have a strong, big, centre-left democratic politics in Hungary.'

(24) Nem mondom el mindazt, amiben **egyetértünk,** és hát majdnem mindenben **egyetértünk mi** itt ebben a teremben legalábbis.

'I will not tell you everything **we agree on**, and **we agree on** almost everything, at least in this hall.'

Example (24) shows that the first-person plural is used as a metapragmatic signal: first the speaker uses the verb *agree* in a more general sense, then he addresses the people in the room directly (gesturally pointing to the place of the speech event), thus involving them in the discourse. The ratio of present and past tense verb usage also confirms that first-person plural forms occur more frequently to describe events rather than as a metapragmatic device: of the 106 cases in which the first-person plural is the primary figure (trajector, see Langacker 2008; Tolcsvai Nagy 2017a, 2017b), 40 occurrences appear in the past tense, representing past events and opinions.

Lilla Petronella Szabó (2022a) developed a radial model based on the centre-periphery schema, which illustrates the relative distance of the first-person plural from the speaker, which is in the centre, and shows the metonymic grouping characteristics of the first-person plural (see Figure 1). The model uses the starting point of Rees (1984), who, based on English personal pronouns, analysed the metaphorical near-far relationships according to their role in political communication, starting from the central deictic function of I and the group-forming property of WE (heterogeneous majority).

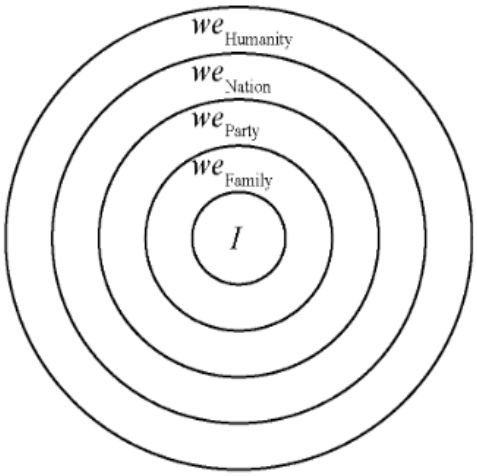

Figure 1. The relative distance of the first-person plural from the speaker (based on Szabó 2022a)

The categories in the diagram can be used in a first-person plural function in political communication. This classification could be applied to the speech text with only minor additions. The family as a set, which is the group closest to the speaker, does not appear in the speech. However, the categories WE_{Party}, (56 occurrences), WE_{Nation} (33) and $WE_{Humanity}$ (16) are found in greater numbers, the order also indicating the distance from the speaker: party is the group of people who share a political identity with the speaker, nation is the group of the citizens of Hungary, and humanity is the most common set. A further category appearing in the speech is the $WE_{Left\text{-}wing}$ (34), which can be placed between party and nation in a metaphorical near-distance relation, a group of people who share the same political views, which also has several occurrences in the speech and must be separated from the categories of party and nation, since it includes a part of the nation, but is a larger set than the party, which it includes. In addition, the purely inclusive use in the speech, when the speaker directly understands the listeners in the plural, occurs twice, and the virtual plural, when the speaker constructs himself as plural (5 times), can be identified.

(25) WE_{Party}: Sokszor **gondoltuk,** hogy ehhez nagyon sokat kell változnia korábbi **pártunknak,** a szocialista pártnak. Ugyan **mi magunk** is **részei voltunk, részesei voltunk** a párt múltjának, tévedésének is.

'**We have** often **thought** that **our** former **party**, the Socialist Party, would have to change a lot to achieve this. **We ourselves were part of it, we were part** of its past, also of its mistakes.'

(26) $WE_{Left\text{-}wing}$: A barakkon belül lehet, hogy ő [Orbán Viktor] azt gondolja, hogy **mi szuverének vagyunk, mi meg úgy látjuk,** hogy magunkra maradtak, magunkra hagyottak

'Within the barrack, he [Viktor Orbán] may think that **we are sovereign**, but **we see ourselves** as being left alone, abandoned'

(27) WE_{Nation}: Ez a Magyarország azt gondolja, hogy bár **közösek vagyunk történelmünkben, kultúránkban, nyelvünkben**, és létezik, a határon túl is átnyúlik a magyar nemzeti közösség, de nem éri be ennyivel, ki kívánja terjeszteni politikai fennhatóságát.

'Hungarian people thinks that although **we share** a common history, culture and language, and that there is a Hungarian national community extending beyond our borders, it is not satisfied with just that, it wants to extend its political sovereignty.'

(28) $WE_{General}$: Magyarország Európa negyedik, ötödik legiparosodottabb országa, ha azt **tekintjük** az iparosodás mércéjének, hogy közös nemzeti jövedelmüknek hány százalékát állítja elő az ipari termelés.

'Hungary is the fourth or fifth most industrialised country in Europe, if **we take** industrialisation as a measure of the percentage of their combined national income that is generated by industrial production.'

(29) Inclusive: **egyetértünk mi** itt ebben a teremben legalábbis.

'**We** in this room at least **agree**…'

(30) Virtual: és őszintén szólva, hogy ez tetszik-e Orbán Viktornak, vagy nem, **mi erre teszünk rá**. [Nevetés, taps.] És barátaim, van egy dolog, **amiről ritkábban beszélünk,** és szeretnék róla egy pár mondatot szólni.

'Honestly, whether Viktor Orbán likes it or not, we don't care. [Laughter, applause.] And my friends, there's one thing that we talk about less often, and I'd like to say a few sentences about it.'

The reference of the sets could not always be clearly determined during the analysis, not even in the thematic context. The reason for this is that, for example, the left wing and the party group are more difficult to separate, in many cases both options proved to be relevant, or the reference was dependent on a certain interpretation. For this reason, the analysis was performed by two annotators, and where there was no agreement, categorisation was based on the most likely interpretation. The figures show that the focus is on the WE_{Party}. This is mainly because the most important event of the past year for the speaker was clearly the formation of his new party. After the party as a group, the left-wing and the nation appear in roughly equal numbers, and this can be explained by the fact that in the first half of the speech the speaker focuses on the political division of the country in relation to different issues.

5.3. Comparison

I followed the same analysis method as above for all four speeches, so that they can be compared. Since the lengths of the speeches are not equal, I have normalised the data, divided the total number of occurrences by the word length of the texts. I use these data in the table later.

5.3.1. Gyurcsány's speeches

In the 2012 text, the first-person singular indicator was 0.020 and the first-person plural indicator was 0.025 (128 and 166 data points per 6,455 words). In the 2022 speech, which contains 4,179 words, these figures are as follows: first-person singular = 0.026 (112 data points in total), first-person plural = 0.036 (154 data points in total). Comparing the speeches from 2012 and 2022, we can see that the use of the first-person singular has increased slightly but not significantly, and its function is quite similar: the speaker uses these forms as metapragmatic signals when reflecting mainly on his own speech activity. In contrast, the use of the first-person plural increases in latter

speech, and the analysis shows that the referentiality of the first-person plural is different. The 2012 speech follows the pattern established in the literature more closely, with references to the party, the left-wing, the nation, and humanity, among which the party reference dominates. In the second speech the category of the party is further divided, the opposition coalition which formed at the time and mavericks in general. The categories of party and nation completely dominate the speech; we can find first-person plural forms with general meaning only in metapragmatic reflections. The reason for this is probably that the speech also functioned as a campaign text before the election; therefore, the politician is obviously reflecting primarily on the category of party over everything else. To explain the increase of the first-person plural, further fine-grained analyses would be needed, as well as the examination of additional state-of-the-nation speeches of the period between the two speeches. Regarding the presence of personal content in the speech, it can be stated that the reference to family does not appear in the first-person plural in the speeches, and the reference to personal content occurs 7 times in the 2012 speech, and only 4 times in the 2022 speech. Examples from the 2022 speech:

(31) Legvégül, legvégül, amikor átsétálok ide, gyalog jöttem. Kabát nélkül, remélem, nem fáztam meg. Megállítanak az utcán mindig.

'Finally, finally, when **I walk** over here, **I came** on foot. Without a coat, I hope **I didn't catch a cold**. They always stop **me** on the street.'

(32) én azt hiszem, hogy a nézőink többségénél én jobban ismerem ezt az ellenzéket

'I think that **I know** this opposition better than most of our viewers'

In example (31), the speaker shares stories of a highly personal nature before the speech, while in example (32), the cognitive verb explicitly indicates the actor's mental state in relation to the opposition.

5.3.2. Orbán's speeches

In the 2010 text, the first-person singular indicator was 0.015 and the first-person plural indicator was 0.035 (based on 5,349 words). In the 2023 speech, these figures are as follows: first-person singular = 0.007, first-person plural = 0.053 (based on 4,521 words). The indicators of the two texts show that the use of the first-person singular has significantly decreased, while its function is completely similar in the two speeches: the speaker uses these forms either as metapragmatic signals when reflecting on his own speech activity or mental state, or they appear as speech acts. There is also data when he talks about himself. The decreasing number is probably explained, in addition to the unchanged functions, by the fact that the text of the speech was structured, written on paper, which the speaker used during the speech. Thus, in this case there is no need to use a great number of metapragmatic signals, and they even decreased over time, the texts use rhetorical devices much more. These metapragmatic reflections mainly appear in the introductory part of the speech, for example in the 2023 speech:

(33) Mégis inkább **rövidebbre fogom,** mert egy hosszú politikai előadás alatt az embernek még az élettől is elmegy a kedve, márpedig nem azért jöttünk össze, hogy elmenjen, hanem éppen, hogy megjöjjön az életkedvünk, és ezzel **fejest is ugrottam a mondandóm közepébe**.

'However, **I will keep it short**, because a long political speech can make people lose their zest for life, and we did not come together to lose our zest for life, but rather to gain it, and with that, **I jumped right into the middle of what I wanted to say**.'

In addition, the proportion of first-person plural forms increases significantly, which probably reflects a conscious effort by the speaker. The increase in the use of first-person plural is particularly striking in the 2nd speech, although the reference of the first-person plural does not fundamentally change, the focus is on the party and the nation, the nation/Hungarians category has got the highest number. Compared to the previous one, due to the Russo-Ukrainian war, a different group appears here, the European Union, which appears as an enemy in the speech. We can assume that by the beginning of the 2020s, the state-of-the-nation speech has already become a conventional political rhetorical genre, for which certain formal criteria have also been developed.

Regarding the appearance of personal content in the speeches, the family set cannot be found in the first-person plural, while the first-person singular appears 18 times in the first speech and only 8 times in the latter one, meaning that its usage rate typically decreases in parallel with the increase in the first-person plural. This also indicates the development and practice of the genre characteristics of the speech. Some examples from the two speeches:

(34) **Forgolódom** a nemzetközi politikában, és gyakran **eszembe jut** a régi magyar sláger.

ʿ**I am involved** in international politics, and **I often think of** an old Hungarian hit song.'

(35) Ahogy **édesanyám** mondaná: Kisfiam, ez nem kívánságműsor, és igaza van.

ʿAs **my mother** would say: "My son, this is not a request show," and she is right.'

(36) 17 éves koromban **nem gondoltam volna,** hogy 30 évvel később egy Emerson Lake and Palmer dal **jelenthet nekem** bármit.

ʿAt the age of 17, **I would never have thought** that 30 years later, a song by Emerson Lake and Palmer **would mean anything to me**.'

(37) Már jó ideje mindenki, akivel **találkozom,** és minden, amit **látok, hallok, tapasztalok** Magyarországon, azt mondja, üzeni, sőt kiáltja, változtass. Ez az üzenet nekem és mindannyiunknak szól.

ʿFor quite a long time now, everyone **I meet** and everything **I can see, hear, and experience** in Hungary has been telling me, sending me a message, even shouting at me: change. This message is **for me** and for all of us.'

(38) **Gyermekkoromban** a kertajtót, de sokszor még a ház ajtaját se zártuk be, vagy egyszerűen a lábtörlő alá tettük a kulcsot, sőt amikor még **lakótelepi panelházban laktam,** ott sem voltak sem berácsozva, sem bevasalva az ajtók.

ʿWhen **I was a child,** we didn't even lock the garden gate, and often didn't even lock the front door, or simply put the key under the doormat. In fact, when **I lived in an apartment block,** the doors weren't even barred or bolted.'

Concerning the use of person-marking elements, a genre-specific characteristic can be seen in the increase of the first-person plural. Due to its heterogeneity, first-person plural is the most suitable form to express attitude, identification, and identity towards both the audience and other persons and groups, and even to influence and manipulate those belonging to the group.

5.3.3. Comparison of the two actors

The diagram shows the proportion of the personalisation in the four speeches (Figure 2).

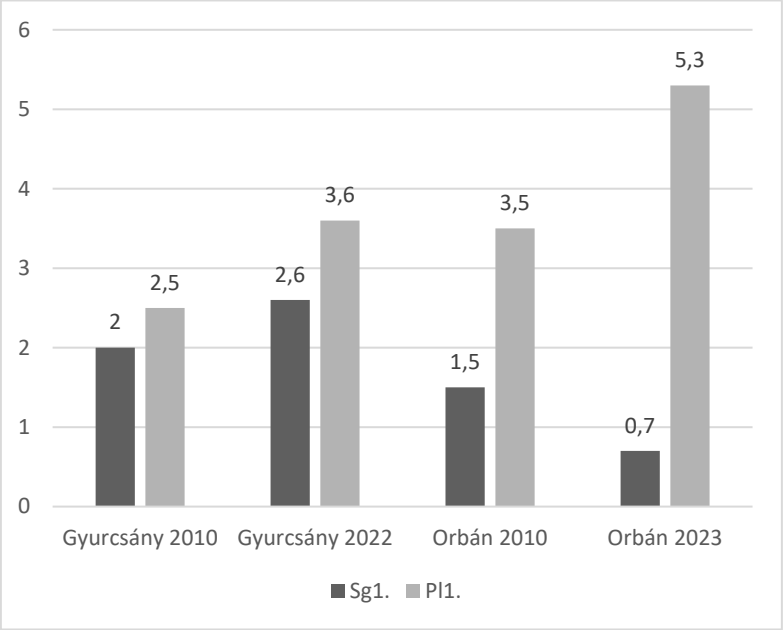

Figure 2. The proportion of the personalisation in the 4 speeches

The most first-person singular forms were used by Ferenc Gyurcsány in 2022, and the most first-person plural forms were used by Viktor Orbán in 2023. The fewest first-person singular forms are found in Viktor Orbán's latter speech, and the fewest are found in Ferenc Gyurcsány's first speech. In the case of the two Gyurcsány speeches, the use of the first-person in both numbers visibly increases, while in Viktor Orbán's the singular forms decrease, while the plural forms increase significantly. Some of the international literature on personalisation draws conclusions from sheer numbers regarding the extent to which the speaker puts himself forward, shares personal content, and the extent to which the texts under study can be considered personalized. However, sheer numbers alone are not sufficient for this. If we only took this into account, Gyurcsány's speeches would seem more strongly personalised, but detailed analysis made it clear that because he spoke freely, many more spoken language elements appeared in his text, and some of these are first-person singular metapragmatic signals and reflect on the speech activity. Table 2 summarises the percentage of first-person singular anchoring elements of the speeches that have personal content, i.e., that play a significant role in the personalised construal of the given text.

	The proportion of personal reference in all first-person singular forms	**The proportion of first-person singular forms in all first-person forms**
Gyurcsány 2012	7/128 – 5%	128/294 – 43%
Gyurcsány 2022	4/112 – 3,5%	112/266 – 42%
Orbán 2010	18/85 – 21%	85/275 – 31%
Orbán 2023	8/32 – 25%	32/276 – 11,5%

Table 2. Proportions of personal references

The proportion of personal references is shown as a percentage, based on the number of first-person forms relating to personal content and the total number of first-person singular forms. In the other column, for the sake of consistency, I have also given the total number of first-person singular forms and the total number of first-person forms, i.e. the combined proportion of singular and plural forms, also expressed as a percentage. According to this, despite the smaller number of first-person singular forms, Viktor Orbán has a stronger degree of personalisation, referring to

himself and to personal content in more cases than the other actor who uses much more first-person singular forms, even if this number is not high, but especially in comparison to the first-person plural.

6. Summary

The study addressed the issue of political personalisation by applying the assumptions of functional pragmatics. Within the operation of social deixis, it interpreted the phenomenon of personalisation as a linguistic tool for the social construction of power relations created in the context of public discourse, which is fundamentally achieved using first-person linguistic forms. In order to truly measure the degree of personalisation, it is not only the mere ratio of singular and plural first-person forms that is relevant, but also the question of what function the personal pronouns perform in the discourse, as determined by the context: how far away from the speaker the persons are who can be interpreted as a group constructed by the first-person plural, or to what extent the first-person singular forms appear in a discourse organising, metapragmatic function, and to what extent they actually refer to personal content. The study is based on four state-of-the-nation speeches delivered at 10-year intervals by the same two political actors. After transcribing and annotating the speeches, I identified the functions of the personal pronouns in the context and distinguished between degrees of intensity. The analysis showed that the personalisation of the speeches is not strong; first-person singular forms appear much more in a metapragmatic function, expressing reflections on the speech activity or the speaker's mental activity. Proportionally, these forms decrease in the texts of the two actors, with a difference of nearly 10 years between them. In the case of the heterogeneous first-person plural, reference to the family closest to the speaker in a metaphorical sense could not be identified, although the proportion of first-person plural usage increased during the period under review.

The qualitative analysis of the speeches confirmed that the quantitative analysis of first-person singular and plural linguistic elements can be misleading, and a fine-grained analysis is essential. The fact that Gyurcsány's speeches contain numerically more first-person singular forms does not in itself translate into a higher degree of personalisation, so it is important to examine function. Orbán's speeches are more personalised, while the other actor's first-person singular constructions are tools of metapragmatic awareness, discourse organising elements characteristic of spoken language.

The first of my two hypotheses was fulfilled. In all four speeches, the first-person plural forms numerically outnumbered the first-person singular ones, due to the genre of the state-of-the-nation speeches, primarily constructing the leader and his party as a community, reporting on the events, actions, and achievements of the given year. However, the second hypothesis was not fulfilled: the emphasis on the speaker's person did not increase over time, despite the fact that both politician remained in the same position over the years in the examined period, and in fact, it showed a decreasing trend in both cases, and in parallel, the share of first-person plural forms with varying references increased. This may well be considered as a feature of the genre that has developed and become traditional over time.

Speeches available online

Gyurcsány Ferenc 2012. https://www.youtube.com/watch?v=1EdiBJkZsFI
Gyurcsány Ferenc 2023. https://www.facebook.com/watch/live/?ref=watch_permalink&v=657210069043363[5]
Orbán Viktor 2010. https://index.hu/video/2010/02/05/orban_viktor_teljes_evertekelo_beszede/
Orbán Viktor 2022. https://www.youtube.com/watch?v=ic25DgzE2DI

[5] The link to the speech is no longer available; it has been deleted from the site.

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VERB-SEMANTIC GROUPS IN THE CORPUS OF HUNGARIAN LYRICAL POETRY: THE DISTRIBUTION OF MENTAL VERBS IN THE SUBCORPORA

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Abstract

The Corpus of Hungarian Lyrical Poetry, compromising four subcorpora containing texts related to contemporary and canonical Hungarian lyricism, is of sufficient size to facilitate detailed qualitative analyses of verb semantics (Horváth et al. 2025). As lyrical discourses feature fictional apostrophe, the presence of apostrophic speakers allows for research not only on emotions but also further mental states that are in the semantic category of mental verbs.

The category of mental verbs as a verb-semantic class has appeared both in Hungarian and international scholarship over the past thirty years, following a traditionally inherited definition, while corpus-based definitions supported by empirical examples remain scarce. In this study, I present possibilities for the qualitative analysis of mental verbs within the Corpus of Hungarian Lyrical Poetry, revealing that the generic characteristics of the individual subcorpora also become examinable through the integration of verb-semantic analysis. My study can be interpreted as pilot research contributing to a broader work that demonstrates the stylistic properties of the Corpus of Hungarian Lyrical Poetry.

Keywords: mental verb, corpus, lyric texts, qualitative analysis

1. Introduction

The appearance of mental verbs and references to them first emerged in works examining the psychology of child development, particularly in studies concerning expressions related to mental development and thought (cf. Piaget 1929). Within this framework, the groups of verbs that can be classified under the category of mental verbs have remained a prominent topic of the psychological literature, with an emphasis on the verb-semantic significance of particular elements of the category (cf. the verbal forms of *think* and *know*, Johnson–Maratsos 1977).

In the Langackerian cognitive linguistic framework, which also underlies the theoretical framework of this paper, this verb category is interpreted from a functional perspective (cf. *imperfective verbs*, Langacker 2008). In the context of linguistics, the definition of mental verbs has not become standardised, over time it has remained varied: certain subgroups of the category have often been used to define the entire category, such as psychological predicates (cf. Jackendoff 2007) or verbs expressing mental processes (cf. Tolcsvai Nagy 2017).

Although research on mental verbs has gained increasing prominence across the interdisciplinary fields of international studies (see, e.g., neurological research by Bruggeman et al. 2016, an analysis of mass-media materials by Pavlenko-Suetina 2024, and a study of song lyrics by Heller 2024), a comprehensive and precise definition of the verbs belonging to the category has not yet been achieved.

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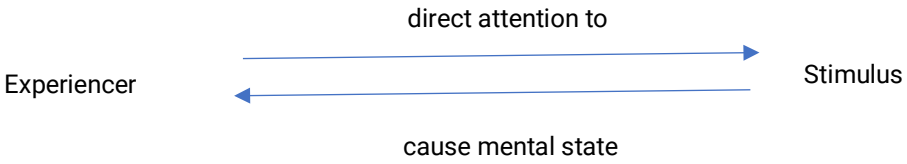
The term *mental verb* as a verb category label can be traced back to Croft's (1993) study. In that study, the author classified the verbs in question according to categories and function.[1] He identified three main classes: perception (e.g. *hear*), emotion (e.g. *love*), and cognition (e.g. *know*). In his view, mental verbs can be interpreted either as experiencer-subject verbs (e.g. *admire*) or as taking an experiencer-object verbs (e.g. *please)*.[2] Later interpretations of mental verbs were aided by definitions stating that the verbs belonging to this category refer to an inner, mental state or mental activity, and are not associated with any overt (physical) action (Biber–Conrad–Leech 2002).[3] Thus, it can be said that every subsequent definition of mental verbs has been based on Croft's study and the tripartite classification found therein. Accordingly, in the case of mental verbs, the experiencer directs their attention towards a stimulus, which, in its entirety or in part, brings about a change in the experiencer's mental state.



(Croft 1993: 64).

In this study, adopting Croft's tripartite classification and testing its annotation applicability, I demonstrate what proportion of verbs expressing perception, emotion, and cognition (belonging to the class of mental verbs) are found in the texts of the subcorpora of the Corpus of Hungarian Lyrical Poetry (Horváth–Simon–Tátrai 2022; Horváth et al. 2025). Through this verb-semantic approach, I also show whether the texts of the subcorpora can be differentiated or perhaps exhibit similarities. It is important to bear in mind that the subcorpora, while their texts are all considered as lyrical texts, belong to different stylistic categories. My paper presents some of the partial results of my doctoral dissertation, and can also be regarded as a preliminary study of a forthcoming study that aims to map the verb-semantic stylistic patterns of the subcorpora of the Corpus of Hungarian Lyrical Poetry.

In what follows, I describe in detail the properties of the subclasses, the characteristics of the texts in the Corpus of Hungarian Lyrical Poetry the process of annotation, and the results that have been produced.

2. Croft's categories in the case of mental verbs

Although Croft classified mental verbs and divided them into categories, he illustrated the group elements only with certain examples, and the classification of the elements was based on linguistic tradition. In my dissertation, and likewise in the present study, I first defined the category labels to allow for an appropriate annotation of the individual elements.

Concerning the category of perception, although it is generally referred to as sensation in the Hungarian literature (cf. Tolcsvai Nagy 2017; Kugler 2024), I use the term perception in my own definition. I interpret perception as describing the process whereby environmental information is

[1] Although this study does not deal with Croftian mental function verbs, due to their importance, they are listed here as the following: 1) causative mental verbs (e.g. *please*), 2) static mental verbs (e.g. *like*), 3) mental activity verbs (e.g. *think of/about*), 4) inchoative mental verbs (*get mad at*).

[2] Experiencer-subject verbs are realised as static, the experiencer is purely in a static mental state regarding the stimulus. By contrast, experiencer-object verbs are causative, the experiencer enters a mental state caused by the stimulus (cf. Croft 1993: 56).

[3] This is contradicted by Israel's (2008) study, as well as the expanded and complete version of this paper, and the data presented in my dissertation also seem to support contradictory claims. However, it is not the purpose of this study to elaborate on this issue.

transformed into experience with the help of sensory organs, that is, it comes into being through the results of interpretative cognitive processes (for a more detailed distinction between sensation and perception, see the definition of philosopher Thomas Reid and its contemporary psychological interpretations, e.g. Dúll 2001). This category thus includes five basic senses related to the sensory organs, namely verbs related to vision, hearing, smell, taste, and touch. Based on previous psychological literature, I have also classified expressions related to pain into this category in my current analysis, in view of the fact that they represent the internal sensory processing of an external stimulus (Dúll 2001).[4]

In the case of emotions, I relied on the six basic emotions defined by Ekman and his colleagues (1972, see Nábrády 2002): happiness, surprise, fear, sadness, anger, and disgust. This list was further expanded by Izard's (1977, see Nábrády 2002) ten basic emotions: interest, joy, surprise, sadness, anger, disgust, contempt, fear, guilt, and shame. To this day, there is still no consensus on the exact number of basic emotions that can be distinguished or defined. In my paper, I therefore employed the verbal manifestations of the conceptual categories used by the aforementioned authors.

Verbs belonging to the category of cognition have often been overlapped with the general conceptual definition of mental verbs. In this conflation, they have been referred to as private verbs, psychological verbs, or psychological predicates (Fetzer 2008), or, in the Hungarian context, they have been reflected as mental processes (cf. Tolcsvai Nagy 2017), thus not distinguishing the connecting term from the unity of the subgroup. In some studies, verbs expressing volition or intention (cf. Givón 1993; Israel 2008) and those expressing beliefs (cf. Montgomery 2002) were treated as a separate group from verbs of cognition. In my study, I have classified under cognition all verbs capable of expressing knowledge (*know*), intention (*want*), belief or conviction (*believe*), etc. Verbs of cognition can therefore generally be characterised as those that designate the speaker's internal mental starting point (Fetzer 2008: 387).

In the following, the annotation carried out in my study therefore employs the categories described above when identifying mental verbs. Below, I briefly present the Corpus of Hungarian Lyrical Poetry and the methodology of the annotation carried out on it.

3. The Corpus of Hungarian Lyrical Poetry and the methodology of the analysis

The Corpus of Hungarian Lyrical Poetry aims to compile texts into a searchable and annotated corpus that includes not only canonical literary works but also other lyric texts, and thus supports a detailed description of the personal reference constructions in lyric discourses (Horváth–Simon–Tátrai 2022; Horváth et al. 2025). The corpus is divided into four subcorpora: (1) canonical Hungarian lyric texts from the first half of the twentieth century (hereinafter referred to as canonical), (2) contemporary lyric texts (i.e. since second half of the twentieth century, hereafter contemporary), (3) contemporary song lyrics (from the 2010s, based on top lists, hereinafter referred to as lyrics), and (4) slam poetry texts (based on recordings from the Slam Poetry Hungary YouTube channel, hereafter slam).

In the present study, I analyse the lyrical texts of the corpus. My choice was motivated, on the one hand, by the corpus's relatively small yet qualitatively suitable size (approximately 790,000 tokens), and, on the other hand, by the fact that fictional apostrophe appearing in lyrical discourse is suitable not only for the expression of emotions but also for articulating various other mental states (Tátrai 2024: 16). It can therefore be assumed that the analysis of mental verbs may yield a large and detailed dataset.

[4] Also including emotional pains, based on that emotional pains are often related to physical pain (cf. Dúll 2001), e.g. *my heart is broken*.

The annotation of the texts was carried out using the qualitative data analysis software MAXQDA[5], within which I tagged the texts with various verb labels. Looking at the corpus as a whole, I created the general *verb* tag, as well as *perception*, *emotion*, and c*ognition* tags, and in uncertain cases an additional *questionable* label. Furthermore, I marked the total number of verbs (excluding the copula) and auxiliary verbs. Non-finite verb forms were not included in the tagging system, nor were inchoative mental verbs (e.g. *get mad at*, cf. Croft 1993). Among mental verbs, I identified absolute mental verbs (cf. Vincze–László 2006), such as verbs that inherently bear the mental property. In cases where researcher intuition or the context of the text did not suffice for determining meaning, I relied on the relevant dictionary entries of the Explanatory Dictionary of Hungarian (ÉrtSz.) or the Comprehensive Dictionary of the Hungarian (Nszt).

In my present research, I aimed to determine in what proportion of prototypical mental verb group elements, those which are clearly identifiable and classifiable on the basis of the literature, occur within the individual subcorpora of the corpus. To this end, I applied Croft's tripartite categories: perception, emotion, and cognition, and each of these categories also received the verb label.

When examining the corpus, I first organized and summarised the annotation with a view to verb tokens rather than their lemmatised forms[6]. Accordingly, taking duplicates into account, I annotated a total of 23,283 verb occurrences in the corpus.

4. The distribution of mental verbs in the Corpus of Hungarian Lyrical Poetry

The distribution of mental verbs within the subcorpora of the Corpus of Hungarian Lyrical Poetry may reveal textual differences and similarities among the various subcorpora. For this reason, I do not include in the present study the so-called questionable category, as analysing the verbs belonging to that category is a larger and more detailed task than the phenomena presented here. I therefore apply the above-mentioned categories when analysing the four subcorpora: canonical, contemporary, lyrics, and slam.

The number of texts in the subcorpora is roughly similar, with minor deviations. The canonical corpus comprises 158 texts, while the contemporary and lyrics corpora contain 120 and 121 texts respectively; and the slam corpus includes 105 texts. Although the number of slam texts are the smallest, in terms of genre, slam is more prose-like, containing longer monological texts, therefore, the subcorpora can overall be considered proportionally balanced.

[5] MAXQDA, Software for qualitative data analysis, 1989–2024, VERBI Software Consult. Sozialforschung GmbH, Berlin, Germany.

[6] Based on the fact that verbs appear more than once in each and every stanza may carry a different meaning related to the context.

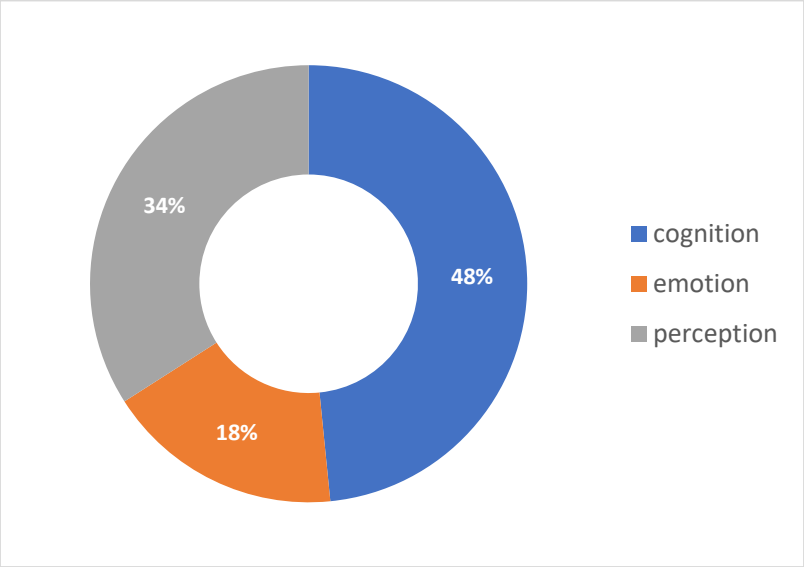


Figure 1. Distribution of Mental Verbs in Lyric Corpus

In the corpus, a total of 23,283 verbs were annotated. The chart above shows that 14% of all verbs were part of prototypical mental verbs categories. The overall number of mental verbs were 3, 313 from which with the most density the category of cognition stands out (1,604) followed by the category of perception (1,128). Lastly, the category of emotions contains 581 verb occurrences.

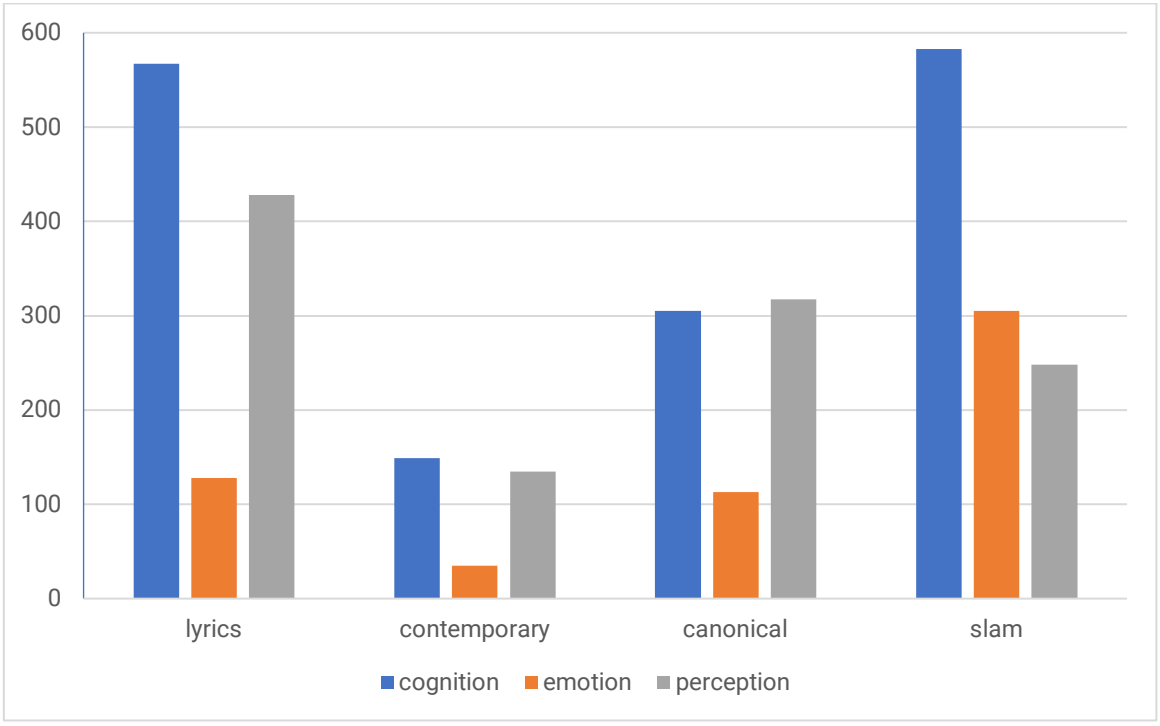


Figure 2. Distribution of mental verb tokens across the subcorpora

The figure above displays the distribution of the mental-verb subcategories across the subcorpora. Since the annotated verbs are presented in their occurrence forms rather than lemmatised versions, the chart reflects token frequency.

In the lyrics subcorpus, a total of 7,376 verbal tokens are recorded, with 1,123 verbal tokens falling within the mental verb category. Notably, verbs expressing constitute the largest number, accounting for 50% of mental verbs. It is followed by perception at 38%, and emotion at a mere 11%.

In comparison of other subcoprora, the contemporary poems subcorpus contains a relatively modest number of 2,903 verbal tokens, of which 319 are categorised as mental verbs. Similarly to most of the subcorpora, tokens of cognition dominate with 47%. As it was seen in lyrics also, cognition in contemporary poems are followed by perception at 42%, while emotion remains infrequent, representing only 11% of the mental verbs in the subcorpus.

The canonical Hungarian poems exhibit more than double the number of verbal tokens compared to the contemporary Hungarian poems with 5,922 occurrences and 735 mental verbs. Contrary to the previous two subcorpora, perception verbs dominate this group at 43%, closely followed by those of cognition at 41%. Verbal tokens of emotions appear in smaller numbers, totaling with 15%.

The slam poetry subcorpus is comparable to the lyrics corpus in terms of the total number of verbal tokens, with 7,082 occurrences and 1,136 mental verbs. With the exception of the canonical poetry subcorpus, slam poetry is predominantly characterised by tokens of cognition at 51%. However, unlike the other subcorpora, tokens of emotion appear in a relatively high proportion at 27%, while those of perception at 22%.

Collectively considering the subcorpora, it is evident that the slam poetry and lyrics contain the largest overall number of verbal tokens, followed by canonical, and then contemporary Hungarian poems. Furthermore, within the mental verb subclasses, tokens of cognition are the most frequent, followed by perception, and finally emotion. Although mental verb tokens overall constitute, as mentioned above, only 14% of the entire corpus, this proportion, nonetheless, renders the Corpus of Hungarian Lyrical Poetry suitable for mental-verb analysis.

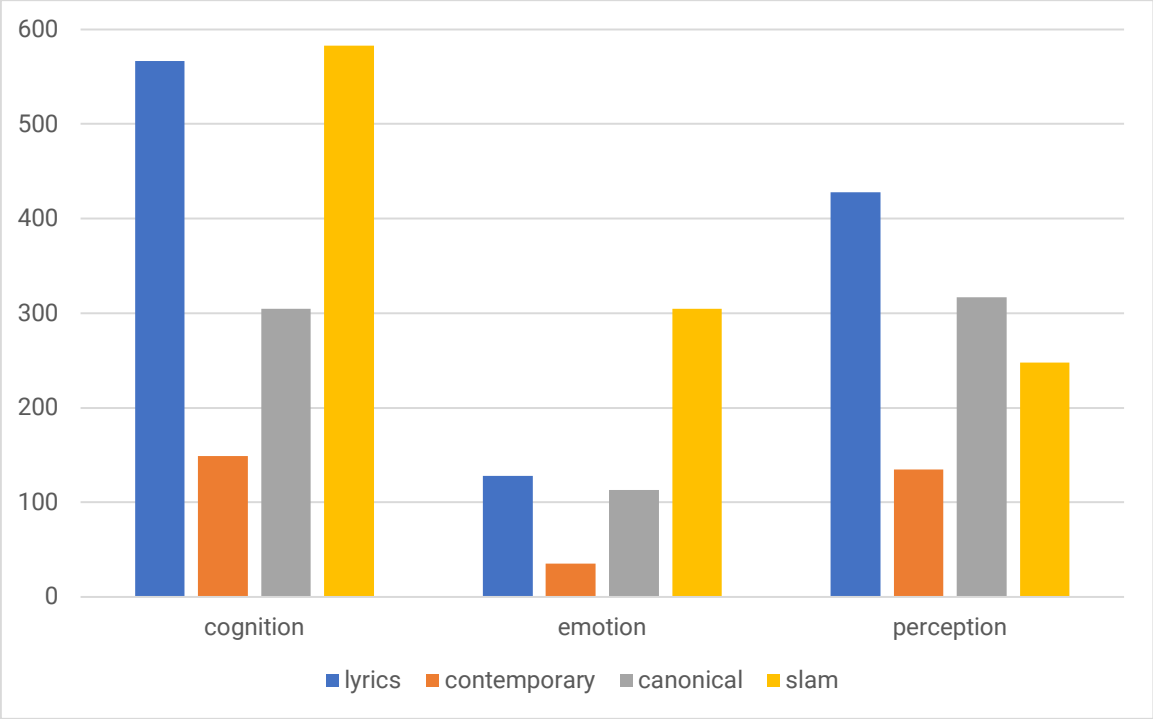


Figure 3. Distribution of mental verb tokens in subcorpus comparison

The figure above reveals that the lyrics and slam subcorpora demonstrate a comparable occurrence of verbal tokens expressing cognition, each representing approximately 50% or more of their overall mental verb occurrences. The verbal forms *akar* ('want') and *elfelejt* '(forget') are prevalent in both subcorpora. Verbal tokens representing emotions exhibit similar frequencies in the lyrics and canonical poems, accounting for 11% and 15%, respectively, with notable verbal forms such as *bán* ('grieve') and *fél* ('fear'). In contrast, the slam corpus distinguishes itself by featuring a significantly higher number of emotional verb tokens at 27%, compared to other subcoropora. This includes notable verbal forms such as *gyűlöl* ('hate'), *imád* ('adore'), *irigyel* ('envy'), and *un* ('be bored'). In terms of perception, the lyrics corpus records the highest number of tokens, while the canonical and slam subcorpora exhibit similar figure, with verbal form such as *bámul* ('stare') and *megnéz* ('look at').

When examining the most frequent lemmas of mental verbs across the subcorpora, the verb *tud* ('know') emerges as the most frequently occuring in every subcorpus. While the verb *tud* functions as main-verb 'know', it also serves as an auxiliary meaning 'can'. For the purpose of assigning verbs to the cognitive category, I have excluded auxliary forms, focusing solely on main verbs, as illustrated in (1). The instances below show that the cognitive category comprises only main verbs, even when the verbs in question also have auxiliary counterparts in the language:[7]

(1) Te jól **tudod**, a költő sose lódít
'You **know** very well that poets never lie' (LE_Jozsef_01)

(2) Nem **kell** a könny meg a komor tekintet, a lefele görbülő szájak
'There is no **need** for tears and gloomy looks, for downturned mouths' (LS_Baranyai_01)[8]

(3) minket **akar** e szerelem
'This love **wants** us' (LC_Varady_03)[9]

Among verbs expressing emotion, the lemma *szeret* 'love, like' occured most frequently across subcorpora. It should be noted that I treated the different verbal forms of *szeret* 'love, like' (*szeret* as 'love, like' and *szeretne* as 'would like') together based on definitions of the Explanatory Dictionary of Hungarian (see definition 6 under *szeret* 'love').

(4) Apa, képzeld, nem **szeretek** focizni
'Dad, imagine, I don't **like** playing football' (LS_Hlinyanszky_01)[10]

(5) Majd kiderül az ég, de ha szivárványt **szeretnék**, számítani kell a felhőkre
'The sky will reveal all, but if you **want** the rainbow, you have to expect clouds' (LL_Follow_01)[11]

[7] The examples are indexed with their codes in the corpus. Song lyrics are marked with LL, contemporary poems with LC, canonical poems with LE, and slam poetry texts with LS in the corpus and in the examples shown here. References to the examples also include the abbreviated surname and/or stage name of the authors, followed by their serial number. The translations of the Hungarian texts are my work.
[8] In Hungarian, the verb *kell* ('need') can also function as an auxiliary verb. In this example, both in Hungarian and English, it is a main verb.
[9] The same appears here, the Hungarian verb *akar* ('want') can also be an auxiliary verb, but not in the example.
[10] In Hungarian, 'like' and 'love' can be expressed with the same verb form *szeret*, while 'like' can have other meanings too. The example here shows an auxiliary like function of szeret 'love' as *nem szeretek* [love.1sg] *focizni* [verb = playing football.INF].
[11] The plain Hungarian text would be closer to *should love*, however, it could not be understandable in the translation. The translation of the verb, due to sentence coherence, does not follow the original first person singular form.

(6) hát nem **szeretnek**! csak a szemedbe tükröznek a szemétdombról összeszedett apró tükördarabokkal…
'They don't **love** me! They just reflect the tiny pieces of mirror they picked up from the garbage dump in your eyes...' (LC_Dobai_01)

(7) Óh mennyire **szeretlek** téged
'Oh, how much I **love** you' (LE_Jozsef_10)

Among verbs of perception, *lát* 'see' appeared with the highest frequency in the lyrics, canonical, and contemporary subcorpora, whereas in the slam poetry corpus, *néz* 'look' was the most frequent.

(8) Semmit se **lát**, ha táncol fényes vizek varázsa
'He **sees** nothing when the magic of sparkling waters dances' (LE_Kosztolanyi_05)

(9) Ajtórésben foszlik köddé borostás, sovány apám, élve, halva soha többé nem **látom** már ezután
'My stubbly, skinny father fades into mist in the doorway, alive, dead, I will never **see** him again after this' (LC_Orban_02)

(10) OTL család az oppok meg sírnak mert **látják**, hogy folyamat halad a cég
'The OTL is a family, the opps are cying because they **see** that the company is progressing' (LL_Ekhoe_01)

(11) És hogy ha hozzátok jövök, értetlenül **néztek**, hogy ez meg hogyhogy tud magyarul beszélni.
'When I come to you, you **look at** me in bewilderment, wondering how I can speak Hungarian.' (LS_Melecsky_03)

The analysis of the Corpus of Hungarian Lyrical Poetry indicated significant similarities across the subcorpora, suggesting the emergence of discernible patterns. One such pattern is observed in the contemporary and canonical poetic subcorpora, which exhibit comparable proportions of verbal tokens expressing perception and cognition. In contrast, the lyrics and slam poetry subcorpora are characterised by a notably high number of verbal tokens pertaining to cognition. Nonetheless, a further comparison with other verb classes is essential to robustly substantiate these stylistic patterns.

5. Summary and outlook

In my study, I undertook the classification of mental verbs present within the Corpus of Hungarian Lyrical Poetry, utilizing Croft's tripartite model as a framework. The primary aim was to analyse the distribution of these subclasses of mental verbs across various text types associated with lyric genres.

The analysis indicated that the Corpus of Hungarian Lyrical Poetry is particularly suitable for examining mental verbs, given their relatively high frequency of occurrence. Additionally, the results unveiled observable correlations between the distribution of these verbal tokens and their respective subcorpora.

This study serves as a segment of a more extensive research initiative aimed at exploring the nuanced meanings of mental verbs. It functions not only as an individual investigation but also as a pilot study for a broader project that seeks to examine the verb semantic categories within the Corpus of Hungarian Lyrical Poetry more thoroughly.

As part of continuation of this research endeavor, I intend to conduct a follow-up study with the collaboration of annotators. The objective will be to delineate the specific stylistic charachteristics of these subcorpora in greater detail, thereby contributing to a more comprehensive understanding of the role mental verbs in the lyrical context and enchancing our grasp of their semantic intricacies within the corpus.

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THE ARTICLE AS A CHALLENGE: ARTICLE USAGE IN SENTENCE TRANSLATIONS MADE BY STUDENTS FROM POLISH TO HUNGARIAN

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Abstract

This paper examines the (in)definiteness expressed by Hungarian articles from a foreign language learning perspective, aiming to identify problems that article usage may pose for learners. The analysis is based on a survey conducted among native Polish speakers, who were asked to translate given sentences from Polish into Hungarian. These sentences contained noun phrases which were potentially challenging in terms of article usage. The selected sentences represent two extreme types of (in)definiteness: specific reference and generics. The category of specific reference includes both situational reference and reference based on general knowledge. The study results reflect the variety of answers provided by participants. These answers are analysed in terms of their correctness and the potential reasons behind incorrect choices. The evaluation uses as its reference point the original Hungarian sentences and the linguistic knowledge of the author. The analysis of the collected data allows for drawing conclusions regarding which type of (in)definiteness presents the greatest challenge for Polish students in the correct use of Hungarian articles.

Keywords: Hungarian as a foreign language, definiteness, indefiniteness, articles, translation

1. Introduction

The expression of (in)definiteness is one of the most complex aspects of grammar in many – if not all – languages. Describing this linguistic phenomenon becomes even more challenging within a comparative framework. Although this paper does not provide a comprehensive analysis of (in)definiteness in Hungarian and Polish, it aims to highlight a significant aspect of this phenomenon.

This paper seeks to examine how Polish speakers, whose native language lacks an article system, employ these linguistic elements to express definiteness in Hungarian, which they are learning as a foreign language. To achieve this goal, a survey was conducted in which participants were asked to translate sentences from Polish into Hungarian. The sentences contained noun phrases expected to be challenging with respect to article usage. The survey was designed in such a way that participants could not omit these problematic noun phrases. Based solely on the provided context, they had to decide which form (no article, indefinite article, or definite article) would best express the same type of definiteness as visible in the original sentence.

The respondents' answers are analysed in groups according to specific aspects of definiteness expressed in the examined noun phrases. The analysis of the collected data does not consider the overall quality or grammatical correctness of the translations, but focuses exclusively on article usage within the selected noun phrases. The goal of the research is to provide answers to the following questions:

Q1. Do the linguistic devices used by the respondents closely match those in the original sentences?

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Q2. If not, what could be the reason?
Q3. Are the other linguistic devices proposed by the respondents correct? If not, why is that?
Q4. In which sentence do the most respondents use the wrong solution? What are the reasons behind this?

The analysis of the results follows a short theoretical outline in which the most crucial concepts are explained

2. Article usage in Hungarian concerning types of (in)definiteness

Article usage in Hungarian is determined by either the type of nominal phrase or the type of (in)definiteness the speaker intends to express. In the former case, there is typically only one correct option. For instance, names of rivers require the definite article (e.g. *a Duna* 'the Danube'), while names of cities usually do not (e.g. *Budapest*). The type of the noun phrase can also be interpreted in a broader context. For instance, the definite article is generally not acceptable in nominal predicates (see Examples (1) and (2)) – unless required by the nature of the noun phrase, for example with the expression of unique reference (see Example (3)). In such cases, learners of Hungarian must memorize specific grammatical rules to use articles correctly.

(1) Katalin **orvos**. 'Katalin is **a doctor**.'

(2) János **egy jó tanár**. 'János is **a good teacher**.'

(3) János **a legjobb tanár**. 'János is **the best teacher**.'

These cases fall outside the scope of this paper, which focuses on the second perspective. Here, the learners' task becomes considerably more complex: to use an article appropriate to the type of definiteness they wish to express, they must first understand what type of definiteness they intend to express. However, native Polish speakers often struggle to grasp how to achieve this using linguistic means absent in their mother tongue.

In Polish, (in)definiteness is expressed either through pronouns (e.g. *każdy* 'every', *pewien* 'some', *zawsze* 'always', *gdziekolwiek* 'anywhere'; Koseska-Toszewa 1982: 61–62), which Polish learners may easily transfer to Hungarian, or through context (Święczkowska 2004: 115). In the latter case, a bare nominal phrase can express all types of (in)definiteness. Definiteness is realized through structures that Święczkowska (2004: 104) terms "situational descriptions", understood as information linked to conditions enabling object identification. For example, referents of nouns like *papież* 'pope' or *rektor* 'rector' are identifiable to the listener based on the time and place of communication. When the speaker does not refer to the current pope or the current rector of their university, this must be explicitly indicated. It is understandable then that native Polish speakers may perceive article usage as redundant.

The learners' task is further complicated by the fact that in Hungarian, there is no simple correspondence between meaning and form, as articles and bare forms can express various types of (in)definiteness. Nevertheless, certain types of reference require specific devices, while others exclude them. (In)definiteness is a complex phenomenon and can be examined from multiple perspectives. For the purposes of this paper, it suffices to analyse article usage in relation to the types of specifics proposed by Chesterman, which can be represented as follows:

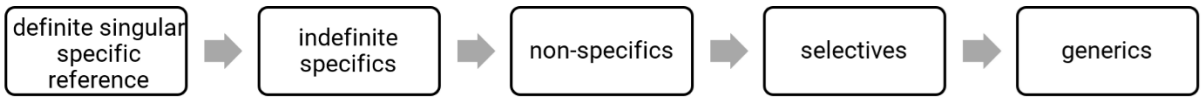

Figure 1. The types of specifics (on the basis of Chesterman 1991: 189)

The definite article *a/az* can be used in most of the types presented in Figure 1. The most prototypical is the first group, which includes definite singular specific reference, where the speaker refers to a concrete object that is definite – meaning it is uniquely identifiable to both the speaker and the hearer (Tolcsvai Nagy 2017: 457). This type of reference is often realized within the framework of the communicative act: the deictic function of the articles enables reference to elements of the communication situation in space or time (Tátrai 2022: 24, 29), as illustrated in the examples below:

(4) **Ez a ruha** nem áll jól rajtad, drágám. '**This dress** does not suit you, darling.'

(5) Csak gyorsan töröld le **a polcot**, mielőtt ezt a vázát ráteszem. 'Just give **the shelf** a quick wipe, will you, before I put this vase on it.' (Lyons 1999: 3)

(6) Add ide nekem **a kalapácsot**! 'Pass me **the hammer**, will you?' (Lyons 1999: 7)

(7) Azt hiszem, **most** már fél tőlem. 'I think she is scared of me **now**.'

(8) **Szerdán** kocsmába megyek. 'I am going to a pub **on Wednesday**.'

(9) Találkozhatunk **a héten**? 'Can we meet **during the week**?'

The examples (4)–(6) present spatial deixis. However, only in (4) does the speaker use a demonstrative pronoun, which in Hungarian – if used with the noun – always co-occurs with the definite article. In (5) and (6) deixis is realized only through the article: the definite article is used because the speaker assumes the hearer can identify the intended referent. This implies there is likely only one shelf or hammer in the immediate context, or the action performed by the speaker sufficiently narrows down the hearer's interpretation.

Examples (7) and (9) demonstrate temporal deixis. In all three sentences, the time of utterance serves as the reference point. This is explicit in (7), but it can also be easily understood that in (8) the speaker is referring to the nearest Wednesday, and in (9), to the upcoming week.

Nevertheless, this type of reference can also extend beyond the immediate communicative situation and rely on shared general knowledge between the speaker and hearer – whether sociocultural, as in (10), or related to a shared temporal and spatial context, as in (11). Moreover, the speaker may invoke an even broader frame of reference, as shown in (12).

(10) Befizetted **az adót**? 'Have you paid the tax?'

(11) Azt hallottam, hogy a miniszterelnök ma megint botrányosan viselkedett 'I hear **the prime minister** behaved outrageously again today' (Lyons 1999: 3)

(12) Mi **az élet**? 'What is **life**?'

The next type discussed, indefinite specifics, primarily involves the use of the indefinite article. In this type of reference, the speaker refers to a concrete object that is indefinite – typically identifiable to the speaker but not to the hearer, as in:

(13) Sam vett **egy képet**, amelyet később a falra akasztott a konyhájában. 'Sam bought **a picture**, which he then hung in his kitchen.' (Chesterman 1991: 80)

The third category contains non-specific references, where the speaker refers to any object matching a given description. For instance, in example (15), the indefinite article indicates that any coffee would be acceptable, as the hearer appears tired and in need of caffeine:

(14) Igyál **egy kávét**! 'Drink **a coffee**!'

The following category is selectives, where the speaker refers to a subgroup or type. Chesterman (1991: 189) illustrates this with the following sentence:

(15) The empress wants **a new elephant**, but she can't find one that pleases her.

This example demonstrates that the empress desires an unspecified, non-concrete elephant – yet not just any elephant, as she has previously rejected some.

The final category is generics, i.e. references which connect to an entire genre or class, or rather express generalizations about those (Lyons 1999: 179), like in the following example: *Dogs have four legs* (while some dogs may lack four legs due to surgery or accident, this does not negate their classification as dogs). It is worth mentioning here that although the type of nominal phrase can influence article usage, Hungarian permits the expression of generics with all possible forms, e.g.:

(16a) **Barátságos kutya** csóválja a farkát.

(16b) **Egy barátságos kutya** csóválja a farkát.

(16c) **A barátságos kutya** csóválja a farkát.

(16d) **Barátságos kutyák** csóválják a farkukat.

(16e) **A barátságos kutyák** csóválják a farkukat.

In English however, bare singulars and the definite article with plural forms cannot be used in the same context:

(17a) ***Dog** has four legs.

(17b) **A dog** has four legs.

(17c) **The dog** has four legs.

(17d) **Dogs** have four legs.

(17e) ***The dogs** have four legs.

Differences in article usage between Hungarian and English are relatively common, as shown in examples (16a)–(16e), (17a)–(17e), as well as (1) and (12). This raises the risk of negative interference as most Polish students learn English in school.

The empirical part of this paper focuses on both extremes: definite specifics (including both deictic and general references) and generics.

3. Material and methods

3.1. Respondents

The survey study was conducted in late April 2023. The participants were 20 Polish native speakers, primarily current or former students of Hungarian Philology at Jagiellonian University. The limited sample size enabled both quantitative and qualitative analysis of the responses.

The participants' average age was 23.5 years. The youngest participants (four individuals) were 20 years old, while the oldest (two individuals) were 32 years old. The age distribution also included two 21-year-olds, one 22-year-old, four 23-year-olds, five 24-year-olds, and two 25-year-olds. In terms of Hungarian language study, the participants' experience ranged from at least 1.5 years (nine persons) to a maximum of 13 years (one person), with an average duration of 4 years. This amount of study time is sufficient to learn that articles are the primary linguistic means of expressing (in)definiteness in Hungarian, though not always adequate to fully master their usage.

3.2. The survey

The participants received a Google Form containing 25 sentences in Polish. The form displayed only the following instruction: "Below you will find some short sentences. Please translate them into Hungarian as accurately as possible." The respondents were unaware of the study's subject, which prevented them from concentrating particularly on article usage or consulting external sources.

Most sentences were originally composed in Hungarian and subsequently translated into Polish by the author of this paper. Only a few cases required such specific grammatical constructions that the sentences had to be created independently. The sentences were designed to be short and simple both structurally and lexically, enabling participants to achieve maximum translation accuracy.

The Table 1 below presents the source of the sentences considered in this paper (eight sentences in total, containing ten nominal phrases, as sentences [3] and [17] each include two noun phrases relevant for analysis). For each sentence, three versions are provided: the original Hungarian version (which served as the reference point for translation evaluation), the Polish version (used in the survey), and an English translation (prepared for this paper, which also demonstrates potential for comparative analysis between Hungarian and English):

No.	Original sentence	Source	Polish translation	English translation
2	**A halak** nem beszélnek.	MNSZ2[1]	Ryby nie mówią.	Fish don't talk.
3	**A hold** is megjelent **az égen**.	MNSZ2	Księżyc też pojawił się na niebie.	The moon also appeared in the sky.
4	A KSH legfrissebb, januári adatai szerint 222 forint **egy kiló kristálycukor** Magyarországon, míg tavaly júliusban csak 184 forint volt.	MNSZ2	Według najświeższych, styczniowych danych KSH kilo cukru na Węgrzech kosztuje 222 forinty, podczas gdy w czerwcu zeszłego roku kosztowało tylko 184 forinty.	According to the latest January data from the KSH, a kilo of sugar costs 222 forints in Hungary, whereas in June of last year it cost only 184 forints.
7	**1922 és 1924 között** Bécsben járt egyetemre.	MNSZ2	Między 1922 a 1924 uczęszczał na uniwersytet w Wiedniu.	Between 1922 and 1924, he attended university in Vienna.
8	**A strandokon** vagy nincs sör, vagy van, s akkor meleg és importált.	MNSZ2	Na plażach albo nie ma piwa, albo jest, ale ciepłe i importowane.	On the beaches, there is either no beer, or if there is, it's warm and imported.
11	Az egyik új ismerősöm viszont azt mesélte, hogy **nyáron** rengeteg itt a kacsa.	MNSZ2	Natomiast jeden z moich nowych znajomych opowiadał, że latem jest tu mnóstwo kaczek.	However, one of my new friends told me that in summer there are lots of ducks here.
17	És **idén**? Mit csinálsz a **nyáron**?	my proposition	A w tym roku? Co robisz latem?	And this year? What are you doing in the summer?
23	Miért nem mondtad, hogy **a földön** egyedül csak **színésznőt** érdemes szeretni!	Wilde, Oscar: *Dorian Gray arcképe*	Czemu nie mówiłeś, że na świecie warto kochać tylko aktorkę!	Why didn't you tell me that the only thing worth loving is an actress?

Table 1. The list of the sentences included in the survey with the analysed noun phrases in bold

[1] Magyar Nemzeti Szövegtár 2. (Hungarian National Corpus: https://clara.nytud.hu/mnsz2-dev/).

The respondents' translations are analysed below in groups based on the type of (in)definiteness expressed in the examined nominal phrases: (1) situational definiteness (Sentences [7], [11], [17]), (2) general definiteness ([3], [8], [23]), and (3) generic usage ([2], [4], [23]).

4. Results

4.1. Situational definiteness

The category of situational definiteness examined in this paper pertains to temporal deixis. One of the examples turned out to be an unexpecting challenge:

Respondent No.	Adnotations	Translation prepared by the respondent
1	*	**A 1922 és 1925 között** a Bécsi egyetemre járt
2		**1922 és 1924 között** járt az egyetemre Bécsben
3		**1922 és 1924 között** az egyetemre járta Bécsben.
4		**1922 és 1924 között** a bécsi egyetemen járt
5		**1922 és 1924 között** a bécsi egyetemre járt.
6	*	**A 1922 és 1924** között Bécsi egyetemre járt.
7		**1922-1924 között** Vien egyetemre járt.
8		**1922 és 1924 között** Bécsi egyetemen járt.
9	*	**A 1922 és 1924 között** a bécsi egyetemre járt.
10	*	**A 1922–1924 között** egyetemre járt Bécsben
11		1922 és 1924 között járt az egyetemre Bécsben.
12		1922 és 1924 között a Bécsi egyetemre részt vett.
13		1922 és 1924 az egyetemre Bécsben járt.
14		1922 és 1924 közben járt egyetemre Bécsben.
15	*	**A 1922 és 1924 között** az egyetemre járt Bécsben.
16		**1922 és 1924 között** a bécsi egyetemre járt.
17		**1922 és 1924 között** Bécsben járt az egyetemre.
18		**1922 és 1924 között** a bécsi egyetemre járt.
19	*	**1922 és 1924 év között** egyetemre járt Bécsben
20		**1922 és 1924 között** a bécsi egyetemre járt

Table 2. The translations of Sentence [7] (*1922 és 1924 között Bécsben járt egyetemre* 'Between 1922 and 1924, he attended university in Vienna')

The analysed phrase could be considered as a simple one, typically introduced at the very beginning of language courses. However, 30% of respondents incorrectly used the definite article. The sentence would likely have been less problematic if it had contained a single year (e.g. *1922-ben* 'in 1922'). Nevertheless, it is noteworthy that so many participants assumed an article was required merely because the structure was more complex than usual. Participant 19 produced a structure close to the correct form (*a 1922-es és az 1924-es év között*), though it could not be considered fully correct due to missing suffixes and, more importantly, the missing article.

The next example involves an even more elementary construction, yet students still provided varied responses:

Respondent No.	Adnotation	Translation prepared by the respondent
1	!	De **ebben az évben**? Mit csinálsz nyáron?
2	!	És **ebben az évben**? Mit csinálsz nyáron?
3		És **idén**? Mit csinálsz nyáron?
4	*	És **mai évben**? Mit csinálsz nyáron?
5		És **idén**? Mit csinálsz nyáron?
6		És **idén**? Mit csinálsz nyáron?
7	*	És **jelenlegi évben**? Van terved nyár idejére? (Mit csinálsz nyáron?)
8		És **idén**? Mit csinálsz nyáron?
9		És **idén**? Mit csinálsz?
10		És **idén**? Mit csinálsz nyáron
11	!	És **ebben az évben**? Mit csinálsz nyáron?
12	!	És **ebben az évben**? Mit csinálsz nyáron?
13	!	És **ebben az évben**? Mit csinálsz nyáron?
14	!	És **ebben az évben**? mit csinálsz nyáron?
15	!	És **ebben az évben**? Mit csinálsz nyáron?
16	!	És **ebben az évben**? Mit csinálsz nyáron?
17		És **idén**? Mit csinálsz nyáron?
18		És **idén**? mit csinálsz nyáron?
19	!	És **ebben az évben**? Mit csinálsz nyáron?
20		És **idén**? Mit csinálsz nyáron?

Table 3. The translations of Sentence [17]
(*És idén? Mit csinálsz a nyáron?* 'And this year? What are you doing in the summer?')

Only nine respondents used the lexeme *idén* 'this year', which also appears in the original sentence. Another nine used the phrase *ebben az évben*, which is also correct. Both expressions are equivalent in meaning, though the latter's structure more closely resembles the analogous phrase in Polish *(w tym roku)* – and, it should be added, in English. Naturally, the Polish equivalent does not include an article, yet – as shown in Table 3 – the students correctly remembered to use it in Hungarian. Two incorrect answers (*mai évben* – Respondent 4, and *jelenlegi évben* – Respondent 7) are ungrammatical, as such phrases do not exist in Hungarian. The students may have formed them by analogy with existing temporal expressions like *jövő évben* 'next year' and *múlt évben* 'last year'. These established phrases, however, are typically used with the definite article – which is notably absent in the participants' translations.

Given the variety of responses observed above, it is particularly interesting to examine another deictic phrase in the same sentence: *a nyáron* 'in the summer'. In this context, none of the students (with the exception of Respondent 9, who omitted this information entirely) used an article. This includes even Respondent 7, despite their use of such a possessive phrase (*nyár idejére* 'for the time of summer') in the translation which is not very common in Hungarian.

This observation can be usefully compared with the next example, which includes a very similar deictic phrase:

Respondent No.	Adnotation	Translation prepared by the respondent
1		Márpedig az egyik az új ismerősömök között mesélte, hogy **nyáron** csomó kecse itt található
2		Azonban egyik az új ismerőseim között mesélte, hogy **nyáron** sok kacsa itt van
3		Ezzel szemben egyik ismerősöm mesélte, hogy **nyáron** itt van sok kacsa.
4		Ezért egy az új barátoimból mesélt, hogy **nyáron** sok kacska itt
5		Viszont az új ismerőseim egyike mesélt, hogy **nyáron** rengeteg kacsa itt van.
6		Egyik az új barátaimból pedig azt mesélte, hogy **nyáron** rengeteg kacsa itt található.
7		Viszont az egyik új ismerősöm elmesélte, hogy rengeteg kacsa itt van **nyáron**
8		Egyik új ismerősöm inkább azt mondta, hogy **nyáron** rengeteg kacsa itt van.
9		Egyik új barátom azonban azt mondta, hogy sok kacsa van itt **nyáron**.
10		De az egyik új ismerősöm mondta, hogy **nyáron** sok kacsa itt van
11		Viszont az egyik új barátom mesélt, hogy **nyáron** itt sok kacsa van.
12		Az egyik új barátoim vissza mesélt, hog **nyáron** sok kacsa itt van.
13		Mivel egyik új ismerőim mondt, hogy **nyaron** sok kacsák van itt.
14		míg egy új ismerősöm mesél , hogy **nyáron** it rengeteg kacsavan
15		De egyik új barátaimmal mesélte, hogy **nyarallal** itt van sok kacsa.
16		Azonban egy új barátom azt mondta, hogy sok kacsa van itt **nyáron**.
17		Az egyik új ismerősöm pedig elmesélte, hogy **nyáron** itt rengeteg kacsa van.
18		Egyik új barátom azonban azt mondta, hogy sok kacsa van itt **nyáron**.
19		Az egyik ismerősöm pedig mesélte, hogy **nyáron** itt rengeteg kacsa van
20		Egyik új ismerősöm mesélte, hogy **nyáron** sok kacsa van itt

Table 4. The translations of Sentence [11] (*Az egyik új ismerősöm viszont azt mesélte, hogy nyáron rengeteg itt a kacsa*. 'However, one of my new friends told me that in summer there are lots of ducks here.')

In this case, all respondents provided the same answer, which was also correct. The solution used by Participant 15 was also considered acceptable because – despite the incorrect grammatical form (likely formed by analogy with other seasonal expressions like *tavasszal* 'in spring' and *ősszel* 'in autumn') – no article was used.

Summing up, the consistent omission of articles in both instances should not be regarded as coincidental. It is highly probable that respondents are unaware that in Hungarian, supplementary information can be indicated using the definite article: the form *a nyáron* ('in the summer') refers to the upcoming summer and would have been more appropriate in translating the previous sentence, which explicitly references the current year (*És idén? Mit csinálsz a nyáron?*). It appears that respondents only remember to use articles in more complex structures (such as *ebben az évben* or **a 1922–1924 között*), which does not always align with grammatical rules. It can be also assumed, however, that students omit the articles in the expressions where they do not perceive and which they treat only as an adverb, even if the adverb's base can function as a noun as well (e.g. este 'in the evening' or 'evening').

4.2. General definiteness

The general definiteness presented in the sentences taken into consideration within this paper varies slightly across examples. What links them, however, is that all nominal phrases refer to elements existing outside the immediate situational context, accessible only through sociocultural knowledge and shared background understanding.

In this context, Sentence [3] represents a prototypical example of general definiteness:

Respondent No.	Adnotation	Translation prepared by the respondent
1		**A hold** is megjelent az égen
2		**A hold** is felbukkant az égen
3	*	**Hold** megjelent az égen is.
4	*	**Hold** is feltűnt az égen
5		**A hold** is jelent meg az égen.
6	*	**Hold** az égen megjelent is.
7	*	**Hold** megjelent az égen
8		**A hold** megjelent az égen
9		**A hold** is megjelent az égben.
10		**A Hold** is jelentett meg az égben
11		**A hold** megjelent az égen.
12	*	**Hald** megjelent az égen.
13		**A hold** is megjelent az égen.
14	*	**Hold** feltűnik az egén.
15	*	**Hold** is megjelent az égen.
16	*	**Hold** is megjelent az égen
17		**A Hold** megjelent az égen is.
18		**A hold** is megjelent az égen
19		**A hold** is megjelent az égbolton
20		**A hold** is megjelent az égen

Table 5. The translations of Sentence [3]
(*A hold is megjelent az égen*. 'The moon also appeared in the sky.')

Just over half of the participants translated the sentence correctly. 40% of respondents omitted the article, which is ungrammatical in this context. This omission was likely influenced by the similarity between the given nominal phrase and proper names, which typically do not require articles in Hungarian. It is worth noting that in the Polish version, the nominal phrase referring to the Moon appears as the first word of the sentence and is capitalized like a proper noun. Nevertheless, some participants (No. 10 and 17) used both capitalization and the definite article, indicating their awareness that this Hungarian noun requires an article even when functioning as a proper name. Respondent 12's answer was considered incorrect solely due to the lack of an article, as spelling errors were not considered in this analysis.

Additionally, Sentence [3] contains another nominal phrase where article usage expresses general definiteness: *az égen* ('in the sky'). This phrase does not require separate analysis, as all participants provided the same answer, using the definite article (the only exception being Respondent 19, who used a different noun but also with an article). Although the uniqueness of the referent

(there being only one sky) might theoretically preclude other options, this is unlikely the reason for the unanimous responses. Conclusions drawn from other sentences suggest that this expression is fixed in the participants' memory due to its frequent occurrence as a set phrase in texts and lyrics.

A similar nominal phrase appears in Sentence [23]; in this case, however, the responses show considerable variation:

Respondent No.	Adnotation	Translation prepared by the respondent
1		Miér nem mondta, hogy **a világon** érdemes szeretni csak a színésznőt
2		Miért nem mondtad, hogy **a világon** csak színésznőt érdemes szeretni
3		Miért nem mondtad, hogy érdemes szeretni csak egy színésznőt **az egész világon**!
4		Mert nem mondtál, hogy **a világon** értelmes csak színésznő szerelmi!
5		Miért nem mondtad, hogy csak színésznőt érdemes szeretni **a világban**!
6		Miért nem szóltál semmit arról, hogy **a világban** érdemes csak egy színésznőt szeretni.
7	!	Miért nem mondtad, hogy **világszerte** nem hiába csak egy színésznő szeretni lehet!
8		Miért nem mondtad, hogy **a világon** csak a színésznőt érdemes szeretni.
9		Miért nem mondtad, hogy **a világon** csak egy színésznőt érdemes szeretni!
10		Miért nem szóltál, hogy érdemes csak színésznőt szeretni **a világban**
11		Miért nem mondtad, hogy **a világon** érdemes szeretni csak a színésznőt!
12		Miért nem mondtál, hogy **a világon** csak érdemes a színésznőt szeretni!
13	*	Miért nem mondtál, hogy **világon** csak a színesznőt érdemes szeretni!
14	*	Miért nem mondtad, hogy **világon** csak színésznőt szeretni érdemes.
15	*	Miért nem mondtad, hogy **világon** csak színésznőt érdemes szeretni.
16		Miért nem mondtad, hogy **a világon** csak egy színésznőt érdemes szeretni
17		Miért nem mondta, hogy **a világon** csak a színésznőt érdemes szeretni!
18		Miért nem mondtad, hogy **a világon** csak egy színésznőt érdemes szeretni!
19		Miért nem mondtad, hogy **a világon** csak a színésznőt érdemes szeretni!
20		Miért nem mondtad, hogy csak színésznőt érdemes szeretni **a világon**

Table 6. The translations of Sentence [23] (*Miért nem mondtad, hogy a földön egyedül csak színésznőt érdemes szeretni!* 'Why didn't you tell me that the only thing worth loving is an actress?')

Although it is not the subject of the study, it is worth noting that participants used the noun *világ* 'world' rather than *föld* 'earth' as in the original Hungarian sentence, due to the author's translation choice. The survey employed the Polish expression *na świecie* 'in the world', which sounds more natural in Polish, and this lexical substitution did not affect the relevant article usage patterns.

As shown in Table 6, the vast majority of respondents (80%) correctly used the definite article. The responses from Participants 5, 6, and 10 were also considered correct, as their use of the inessive case did not impact article usage. Participant 7 employed an alternative phrase that is grammatically correct without any article. In summary, while the proportion of correct answers is significantly higher than for the phrase "the Moon" in Sentence [3], the responses show less uniformity than those for the phrase "in the sky" from the same sentence.

The last example in this category involves a plural noun form:

Respondent No.	Adnotation	Translation prepared by the respondent
1		**A strandokon** vagy nics sör, vagy van, de meleg és importált
2		**A strandokon** vagy nincs sör, vagy van, de túl meleg és importált
3		**A strandokon** vagy nincs sör, vagy van, de meleg és importált.
4		**A strandon** nincs sör, vagy van, de meleg is importált
5	*	**Strandokon** vagy nincs sör, vagy van, de meleg és importált.
6		**A strandokon** vagy nincsen sör, vagy ha van, meleg és importált.
7		**A strandon** akár nincs sör, akár van, de a másik esetében csak meleg és importált.
8	*	**Strandokon** vagy nincs sör, vagy meleg és importált.
9		Nincs sör **a strandokon**, vagy van, de meleg és importált.
10	*	**Strandokon** vagy nincs sör, vagy van, de meleg és importott
11		**A strandokon** nincs sör vagy van, de meleg és importált.
12		**A strandokon** nincs sört vagy meleg és importált van.
13	*	**Strandokon** vagy nincs sör, vagy van, de meleg és importált.
14	*	**Strandon** vagy nincs sör, vagy van, de meleg és import.
15		**A strandokon** vagy nincs sör, vagy van, de meleg és importált.
16		Vagy nincs sör **a strandokon** vagy van, de meleg és importált.
17		**A strandokon** vagy nincs sör, vagy van, de meleg és importált.
18		**A strandokon** vagy nincs sör, vagy van, de meleg és importált.
19		**A strandokon** vagy nincs sör, vagy van, de meleg és importált
20	!	**A strandon** akár nincs sör, akár van, de meleg és importált

Table 7. The translations of Sentence [8] (*A strandokon vagy nincs sör, vagy van, s akkor meleg és importált.* 'On the beaches, there is either no beer, or if there is, it's warm and imported.')

In one quarter of the responses, the article was omitted, which is grammatically incorrect in the given context. Only Participants 14 and 20 used the singular form of the noun; however, only the latter provided a correct answer with appropriate article usage.

Based on the analysed sentences, it appears that Polish learners are uncertain how to express definiteness that extends beyond the immediate situational context and relies on shared general knowledge. Although they avoid the indefinite article in such cases, they often incorrectly assume that a bare noun phrase is suitable for expressing referents that are not strictly defined or limited by the closest context.

4.3. Generic usage

Generic reference is illustrated in Sentences [2], [4], and [23], each exhibiting distinct characteristics. The most prototypical example appears in Sentence [2], where *halak,* the plural form of the Hungarian noun for 'fish', refers to the entire species:

Respondent No.	Adnotation	Translation prepared by the respondent
1		**A halok** nem beszélnek
2		**A halak** nem beszélnek
3		**A halok** nem beszélnek.

4	*	**Halok** nem beszélnek
5	*	**Halak** nem mondanak.
6	*	**Halak** nem beszélnek.
7	*	**halak** nem tudnak beszélni
8	*	**Halak** nem beszélnek.
9		**A halak** nem beszélek.
10	*	**Halak** nem beszélnek
11		**A halok** nem beszélnek.
12	*	**Balam** nem beszélnek.
13	*	**Halok** nem beszélnek.
14	*	**Halok** nem beszélnek.
15	*	**Halak** nem beszélnek.
16	*	**Halak** nem beszélnek
17	*	**Halak** nem beszélnek.
18		**A halak** nem beszélnek.
19	*	**Halak** nem beszélnek
20	!	**A hal** nem beszél

Table 8. The translations of Sentence [2] (*A halak nem beszélnek*. 'Fish don't talk.')

As shown in the table above, only 30% of respondents used the definite article. Participant 20 used the singular form of the noun; although this differs from the original sentence, it is still grammatically correct as it includes the article. This case is particularly interesting, as it demonstrates the respondent's awareness that the singular form can refer not merely to an individual object but to an entire category. Nevertheless, most participants omitted the article. This likely stems from the tendency among native Polish speakers to perceive the bare noun form as appropriate for expressing generalized reference rather than denoting specific entities. However, this approach is grammatically incorrect in Hungarian and can be seen as an interference from English, which is commonly familiar to Polish students.

In Sentence [4], generic reference is expressed by an indefinite article:

Respondent No.	Adnotation	Translation prepared by the respondent
1		A legfrissebb, janúari KSH adatok szerint, **egy kilo cukort** 222 forintot kerül, miközben júniusben, múlt évben, csak 184 forintot került
2		A KSH legfrissebb, januári adatai szerint **egy kiló cukor** Magyarország 222 forintba kerül, időközben tavaly júliusban csak 184 forintba került
3		A legfrissebb, januári KSH datai szerint, Magyarországon **egy kiló cukor** 222 forintba kerül, míg tavaly júniusban csak 184 forintba került.
4		A legfrissebb, januári KSH adatai szerint, az **egy kiló cukor** 222 forint kerül Magyarországon, időközben júniusban tavaly csak 184 forint
5		A KSH-es legfrissebb, januári adatok szerint Magyarországon **egy kiló cukor** 222 forintba kerül, míg tavaly júniusban csak 184 forintba került.
6	*	A legfrissebb, januári KSH adatai szerint cukor 222 forintba került, amíg múlt év júniusában csak 184-be.
7		KSH szervezetnek a legfrissebb, januári információjának alapján

		Magyarországon **egy kiló liszt** 222 HUF-be kerül, pedig tavaly júniusban csak 184 HUF(Ft)-be(a).
8		A legfrissebb KSH januári adatai szerint **egy kiló cukor** 222 forintba kerül, míg tavaly júniusban 184 forintba került.
9		A KSH legfrissebb, januári adatai szerint Magyarországon 222 forintba kerül **egy kiló cukor**, míg tavaly júniusban már csak 184 forintba került.
10		A legújabb januári KSH adatai szerint **egy kiló cukor** Magyarországon 222 huf-ba kerül, amikor tavaly júniusban csak 184 huf-ba került
11	*	A legújabb, januari KSH adat szerint, hogy Magyarországon **kiló cukor** kerül 222 forintbe, miközben múlt júniusban csak 184 forintbe került.
12		A KSH legfrissebb, januári adatai szerint Magyarországon 222 forintba kerül **egy kiló cukor**, míg tavaly júniusban már csak 184 forintba került.
13		Szerint a legfrissebb KSH juniusi adataik **egy kilo cukrot** Magyarországon 222 ft bekereül, míg a múlt év juniusban csak 184 ft bekerült.
14	*	legújabb januári adok szerintik, hogy **kiló cukra** kerül 222 forintot, miközben tavaly júniuban került 184 forintot.
15		A legfrissebb janauári adatok KSH szerint, hogy Magyarországon **egy kiló cukor** kerül 222 forintba, míg múlt júniusban került csak 184 forintba.
16		A KSH legfrissebb januári adatai szerint **egz kilo cukor** Magyarországon 222 forintba kerül, de tavaly júniusban csak 184 forintba került.
17	!	A legfrissebb, januári KSH adatainak alapján Magyarországon **1 kiló cukor** 222 forintba kerül, mikor tavaly júniusban csak 184 forintba került.
18		A KSH legfrissebb, januári adatai szerint Magyarországon 222 forintba kerül **egy kiló cukor**, míg tavaly júniusban már csak 184 forintba került.
19		A KSH legfrissebb, januári adatai szerint, Magyarországon **egy kiló cukrot** 222 forintba kerül, amikor tavalyi júniusban csak 184 forintba került be
20	!	A legújabb, januári adatok szerint **1 kg cukor** 222 forintba kerül Magyarországon, mivel tavaly júniusban csak 184 forintba került

Table 9. The translations of Sentence [4] (*A KSH legfrisebb, januári adatai szerint 222 forint egy kiló kristálycukor Magyarországon, míg tavaly júniusban csak 184 forint volt*. 'According to the latest January data from the KSH, a kilo of sugar costs 222 forints in Hungary, whereas in June of last year it cost only 184 forints.')

This construction appears in 75% of the translations, which represents a favourable outcome given that the Polish source sentence contains no determiner to suggest the use of the indefinite article. Two participants omitted the article – or three, if including Participant 6, who also omitted the quantifier. These responses cannot be considered correct. Interestingly, two participants (17 and 20) used a numeral, which in Hungarian is compatible with the indefinite article. These answers were accepted as correct since even native Hungarian speakers might find it challenging to distinguish between these forms in many contexts.

The final example of generic reference features an original nominal phrase without any article:

Respondent No.	Adnotation	Translation prepared by the respondent
1	**!**	Miér nem mondta, hogy a világon érdemes szeretni csak **a színésznőt**
2		Miért nem mondtad, hogy a világon csak **színésznőt** érdemes szeretni
3	**!**	Miért nem mondtad, hogy érdemes szeretni csak **egy színésznőt** az egész világon!

4		Mert nem mondtál, hogy a világon értelmes csak **színésznő** szerelmi!
5		Miért nem mondtad, hogy csak **színésznőt** érdemes szeretni a világban!
6	**!**	Miért nem szóltál semmit arról, hogy a világban érdemes csak **egy színésznőt** szeretni.
7	**!**	Miért nem mondtad, hogy világszerte nem hiába csak **egy színésznő** szeretni lehet!
8	**!**	Miért nem mondtad, hogy a világon csak **a színésznőt** érdemes szeretni.
9	**!**	Miért nem mondtad, hogy a világon csak **egy színésznőt** érdemes szeretni!
10		Miért nem szóltál, hogy érdemes csak **színésznőt** szeretni a világban
11	**!**	Miért nem mondtad, hogy a világon érdemes szeretni csak **a színésznőt**!
12	**!**	Miért nem mondtál, hogy a világon csak érdemes **a színésznőt** szeretni!
13	**!**	Miért nem mondtál, hogy világon csak **a színesznőt** érdemes szeretni!
14		Miért nem mondtad, hogy világon csak **színésznőt** szeretni érdemes.
15		Miért nem mondtad, hogy világon csak **színésznőt** érdemes szeretni.
16	**!**	Miért nem mondtad, hogy a világon csak **egy színésznőt** érdemes szeretni
17	**!**	Miért nem mondta, hogy a világon csak **a színésznőt** érdemes szeretni!
18	**!**	Miért nem mondtad, hogy a világon csak **egy színésznőt** érdemes szeretni!
19	**!**	Miért nem mondtad, hogy a világon csak **a színésznőt** érdemes szeretni!
20		Miért nem mondtad, hogy csak **színésznőt** érdemes szeretni a világon

Table 10. The translations of Sentence [23] *(Miért nem mondtad, hogy a földön egyedül csak színésznőt érdemes szeretni! '*Why didn't you tell me that the only thing worth loving is an actress?')

As shown in the table above, only 30% of participants used the original construction. This provides further evidence that native Polish speakers tend to avoid bare noun phrases, which may indicate hypercorrection. Interestingly, the alternative solutions are equally prevalent: another 30% of respondents used the indefinite article, while 40% preferred the definite article.

This example is indeed complex. All three constructions are grammatically possible, though each conveys a different nuance. The bare noun phrase represents the most neutral option and aligns most closely with the author's original intention – that any woman deserves love, provided she is an actress. The indefinite article suggests the importance of choosing a specific actress as one's lover, while the definite article can be interpreted in two ways: either as a generic reference or as denoting a particular actress. Translations using the indefinite article are marked with an exclamation point, as they correspond most directly to the original sentence's context (though in some cases the word order is debatable – see Participants 3 and 6).

Summing up, expressing generic reference in Hungarian appears challenging for native Polish speakers. They seem unfamiliar with the possibility of using singular forms or bare nouns for generic reference – for this purpose, they generally resort to the plural.

5. Conclusion

The considerable variation in responses observed across all sentences reflects the respondents' uncertainty in applying Hungarian articles. Table 11 illustrates the extent to which participants were able to correctly express (in)definiteness using Hungarian articles – including cases where their solutions diverged from the original phrasing:

The type of (in)definiteness	Situational usage	General usage	Generic usage
The percentage of the answers containing the same solutions as the ones presented in the original sentence	54	77,5	48
The percentage of the incorrect answers	10	20	26
The percentage of the correct answers which differ from the solutions presented in the original sentence	36	2,5	26

Table 11. The percentage summary of the answers regarding their correctness

According to the data presented in the table, incorrect answers constitute a minority in each category of (in)definiteness. However, in the case of generic reference, they exceed one-quarter of all responses. It is noteworthy that generics – which might be considered the most straightforward type of (in)definiteness – appear to pose the greatest challenge. This likely stems from the assumption that general expressions might not require articles (since the definite article, by its name, might be perceived as defining concrete objects), whereas Hungarian grammar frequently requires their use in many cases. This pattern is evident in Sentence [2] (*A halak nem beszélnek*.) which is the sentence translated with the most incorrect solutions. The number of incorrect answers is 13, exceeding half of the respondents. The next most challenging example was Sentence [3] (*A hold is megjelent az égen*.), which generated 8 incorrect answers. Here, the difficulty arises from the noun phrase *hold* ('moon'), which requires the definite article but it was frequently omitted by participants. This omission likely results from its perceived similarity to proper nouns and the misconception that proper nouns never take articles – an assumption presumably based on prototypical proper nouns and the strong referential function of this type of nouns.

The linguistic devices employed in the original sentences were also the most frequently selected choices among study participants. Notably, only in the first category (situational definiteness) did alternative solutions proposed by students yield more correct than incorrect answers. In the second category (general definiteness), the number of incorrect alternative answers was eight times higher than the number of correct ones, while in the third category (generic reference), the distribution was equal. This suggests that Polish learners feel most confident using Hungarian articles to express situational (in)definiteness, likely because this type relates most directly to elements of the immediate communication context. The other categories appear to require a more abstract level of conceptualization.

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PHATIC LANGUAGE ELEMENTS USED BY TEACHERS TO MAINTAIN CONTACT IN THE DIALOGUES OF ONLINE SYNCHRONOUS AND IN-PERSON CLASSES

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Abstract

Studies analysing classroom discourse have been investigating the nature of effective teacher communication for decades; however, the linguistic tools teachers use to maintain mental connection and mutual attention remain an under-researched area to this day. This study explores the linguistic features of phatic teacher communication used to sustain interpersonal connection through an analysis of dialogue excerpts from 8 synchronous online and in-person lessons. The findings present the specific language elements through which teachers maintain connection with their students, illustrating the pragmatic functions of phatic communication with numerous examples. The results also address the relationship between teachers' phatic communication and student speech. Both the quantitative data and linguistic examples provided in the study may be useful for teacher education students, teacher trainees, and practicing teachers alike, as they can support professional communicative self-reflection regarding the maintenance of classroom connections. Additionally, the findings may serve as a basis for teachers to develop conscious discourse strategies that help engage students more effectively in classroom interaction.

Keywords: discourse analysis, classroom discourse, teacher communication, phatic communication, maintaining connection, online synchronous lesson

1. Introduction

The analysis of discourse in formal communicative settings, such as classroom communication, has been the subject of discourse analysis research for several decades (Iványi 2001; Walsh 2006). The literature on classroom discourse analysis is extensive, and research findings have shown that students' academic achievement is directly related to effective classroom communication (Antalné Szabó 2006; Asztalos 2020; Cazden 2001; Herbszt 2010; Skidmore 2006; Walsh 2006). Teacher communication plays a key role in the effectiveness of classroom discourse, as it is one of the most important tools for achieving and implementing lesson objectives (Antalné Szabó 2015; Herbszt 2010; Sharpe 2008). Although effective teacher communication has been examined from several perspectives (Antalné Szabó 2015; Asztalos 2020; Cazden 2001; Herbszt 2010; Schirm 2015; Skidmore 2006; Walsh 2006), the aspect of maintaining communicative contact in the classroom has so far received less attention (Asztalos 2022a). Without phatic communication, effective information transfer cannot take place, as the breakdown of mutual mental connection disrupts the process of communication (Fercsik–Raátz 2018). This was particularly evident on synchronous online classes held during the COVID-19 pandemic, where participants – despite the simultaneous digital communication – felt that they were unable to establish genuine interaction with one another (Nambiar 2020; Orhan–Beyhan 2020).

This study examines phatic language elements in teacher communication through dialogue scenes from 8 video-recorded synchronous online and face-to-face classes. The investigation combines the academic fields of discourse analysis, pragmatics, communication theory, and classroom

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discourse studies. Using examples, it presents a system of language elements that provides a comprehensive picture of teachers' phatic language use. Furthermore, the analysis reflects on how phatic teacher communication influences student speech. The findings may support teacher trainees in enhancing their communicative self-reflection and developing conscious discourse strategies for maintaining contact in the classroom.

2. Theoretical background

2.1. Phatic communication and its language elements

Beyond information exchange, one of the most important goals of communication is the establishment and maintenance of a relationship between participants, as supported by phatic communication (Bloammert–Varis 2015; Coupland et al. 1992; Jakobson 1960). Without the appropriate establishment and maintenance of connection, the communication process can break down at several points, preventing the effective exchange of information between the parties (Jakobson 1960; Domonkosi 2002; Erdélyi 2012; Fercsik–Raátz 2018). From a pragmatic perspective, phatic utterances can be interpreted as speech acts or linguistic actions whose informational content is largely negligible, but whose function is particularly significant in building interpersonal connection between speakers (Cruz 2007; Pléh 2012; Vanyan 2017).

The phatic function of communication is achieved by participants through both verbal and non-verbal phatic elements (Asztalos 2022a; Balázs 1993; Domonkosi 2002; Erdélyi 2012; Jakobson 1960). This study focuses on the verbal phatic elements. Due to their nature, phatic language elements primarily belong to dialogic discourse. They are present throughout discourses, and their frequency increases at certain key moments, such as during turn-taking (Asztalos 2022a; Vanyan 2017). Furthermore, phatic linguistic behaviour is governed by strict cultural and social norms, and consciously or unconsciously ignoring them can lead to negative judgments (Balázs 1993; Elhami 2020; Ivosavi–Vecsernyés 2022). Conversely, their appropriate use can facilitate the development of relationships between interlocutors, laying the groundwork for communicative cooperation (Coupland et al. 1992; Domonkosi 2002; 2017; Malinowski 1923; Jakobson 1960).

Research on phatic language elements overlaps with the analysis of contact-maintaining linguistic devices in various ways. Most studies focus primarily on phatic language elements that explicitly support the initiation, maintenance, and closure of communicative contact, such as greetings, forms of address, and small talk (Balázs 1993; Coupland et al. 1992; Domonkosi 2002, 2017; Erdélyi 2012; Ivosavi–Vecsernyés 2022). In the past decade, however, several analyses have pointed out that many language elements can also support the construction of communicative contact in implicit ways (Adnan 2022; Asztalos 2022a; Hollóy 2025; Elhami 2020; Vanyan 2017). Although these elements fulfil various other pragmatic functions in communication beyond their phatic role, they always contribute to maintaining mental connection by supporting the construction of joint attention scenes (Adnan 2022; Asztalos 2022; Hollóy 2025; Elhami 2020; Simon–Tátrai 2017; Tátrai 2017; Vanyan 2017). During discourse, constructing a shared scene of attention is a constant task for participants, one that cannot be accomplished without continuous contact (Simon–Tátrai 2017; Tátrai 2017; Tomasello 2011). In this way, elements that support the creation of joint attention scenes inherently possess a phatic function, since maintaining and directing the attention of participants is by nature an interactive act (Simon–Tátrai 2017; Tátrai 2017; Tomasello 2011).

This study examines both language elements that support phatic communication explicitly (hereafter: purely phatic language elements) and those that do so implicitly (hereafter: supplementary phatic language elements). It adopts a classification system developed specifically for the study of classroom discourse (Asztalos 2022a; Hollóy 2025), informed by the relevant literature and the analysed corpus. This system of phatic language elements is summarised in Table 1.

Purely phatic language elements	Supplementary phatic language elements
• Forms of greeting • Expressions substituting for greetings, well-wishes • Forms of address	• Verbs with supplementary phatic function • Possessive structures with supplementary phatic function • Discourse markers with supplementary phatic function • Fixed word combinations/reflective expressions with supplementary phatic function

Table 1. System of phatic language elements for analysis

The role of the phatic language elements of this classification system in classroom discourse is summarised in the Results section based on various examples.

2.2. Maintaining connection in in-person classroom discourse

Maintaining the connection is a shared interest between the teacher and the students throughout the lesson: achieving lesson objectives and establishing an effective teaching-learning process fundamentally depend on the mutual attention of the participants (Antalné Szabó 2015). Phatic communication plays a significant role in the teacher's speech in every segment of the lesson. At the beginning of the lesson, it contributes to establishing attention and shaping personal relationships (Hollóy 2024); during the lesson, it helps maintaining mutual attention and supports information transfer (Asztalos 2022a; Hollóy 2025); and at the end of the lesson, it assists in closing the interaction, evaluating the lesson, and supporting personal relationships (Antalné Szabó 2006; Hollóy 2025). Furthermore, phatic language elements generally support the mechanisms of turn-taking, as teachers use these elements to give the floor to specific students or to reflect on student turns (Antalné Szabó 2006; Asztalos 2022a). They can also support the development of the personal teacher-student relationship, for example, through various small talk elements (Hollóy 2025).

In addition to phatic utterances, teachers can choose from various discourse strategies to maintain student attention. One such tool is questioning: with questions, teachers can continuously maintain students' interest in the subject matter and involve more and more students in classroom discourse (Antalné Szabó 2006, 2015; Király 2017; Faturrochman et al. 2020). Effective teacher explanations can also help maintain attention (Antalné Szabó 2006; Schirm 2013). A good explanation is concise, illustrative, logical, memorable, and captures students' attention. By using various rhetorical tools appropriately, teachers can maintain students' attention during explanations, even when they are passive recipients of information (Schirm 2013). Clear instructions are also crucial for maintaining the connection: based on task-defining statements, students can participate in solving tasks (Antalné Szabó 2006, 2015; Sáfrányné Molnár 2016). Phatic language elements can be part of all teacher utterance types that facilitate interactions (Hollóy 2025).

2.3. Maintaining connection in online synchronous classroom discourse

Due to the rapid spread of Web 2.0 applications, one of the most important aspects of online communication, alongside information transfer, has become its connecting and social function (Gardinaru 2018; Prievara–Pikó 2015). For this reason, messages in digital communication are frequently fundamentally phatic in nature, as users often aim not to share actual information, but to emphasize their presence and establish connections (Gardinaru 2018). As a result of the physical distance between participants and the limited perceivability of non-verbal signs, online platforms provide multimodal signal types that are used exclusively in digital environments and support the phatic function of communication, such as reaction buttons or emojis (Radovanonic–Ragnedda 2012).

The significance of the phatic function of communication in the digital space was also demonstrated in the educational context during the COVID-19 pandemic. Although digital education during the pandemic was implemented in various ways in Hungary, one of the prominent methods was holding online synchronous lessons through video conferencing applications (Asztalos 2022b; Gonda 2022). Questionnaire-based and interview-based research focusing on this period has clearly highlighted that many communication problems arose during the education process (Asztalos 2022b; Gonda 2022; Nambiar 2020; Orhan–Beyhan 2020). Among the various communication difficulties (technical issues, limited perceivability of non-verbal signs, student passivity, etc.), one of the most prominent problems identified by participants in online synchronous lessons was the lack of real connection and interaction (Asztalos 2022b; Gonda 2022; Nambiar 2020; Orhan–Beyhan 2020). This further demonstrates that phatic communication is crucial for successful communication, as without it, participants do not feel that a real interaction has occurred.

3. The aims and hypotheses of the study

The aim of the study is to explore the phatic language elements of teachers' language use in online synchronous and in-person lessons. Phatic language elements are analysed in selected dialogue scenes. The study addresses four main questions: how teacher–student speech time is distributed in the analysed episodes; how frequently phatic language elements appear in teachers' turns; whether their frequency differs between online and in-person settings; and whether teachers' phatic language use affects student speech.

At the start of the study, I formulated the following hypotheses:

1. An asymmetry prevails in teacher-student communication in the dialogue scenes of both online synchronous and in-person lessons: teachers generally speak more, more often and for longer periods than students.
2. In the majority of teacher turns of the dialogue scenes in both online synchronous and in-person lessons, both purely phatic and supplementary phatic language elements can be observed.
   2a. In the majority of the dialogue scenes, supplementary phatic language elements appear more frequently in the teacher's speech than purely phatic elements in both types of lessons.
   2b. In teacher speech during online synchronous lessons, more phatic elements appear in the dialogue scenes than in in-person lessons.
3. If more phatic language elements are observed in the teacher's speech, the number and length of student speech turns increase.

4. Materials and methods

This study examines teachers' phatic communication in 8 video-recorded online synchronous and in-person high school Hungarian language and literature lessons. The characteristics of the 8 lessons are shown in Table 2.

Lesson number and setting	Teacher's gender	Teacher's experience	Type of lesson	School type	School location
1. online	female	beginner	literature	secondary school	Budapest
2. online	female	beginner	Hungarian language	secondary school	Budapest

3. online	male	beginner	literature	secondary school	Budapest
4. online	male	beginner	literature	secondary school	Budapest
5. in-person	female	beginner	Hungarian language	secondary school	Budapest
6. in-person	female	beginner	Hungarian language	secondary school	Budapest
7. in-person	male	beginner	Hungarian language	secondary school	Budapest
8. in-person	male	beginner	Hungarian language	secondary school	Budapest

Table 2. Characteristics of the lessons in the study corpus

It should be noted that each of the eight lessons was taught by a different Hungarian language and literature teacher, hence the corpus comprises analyses of individual teachers' language use across all lessons.

While research on classroom discourse typically considers the lesson as the basic unit of analysis (Antalné Szabó 2015), the aim of this study is to examine teachers' phatic communication in smaller classroom segments for a more detailed approach. Oral discourses can be divided into shorter segments based on thematic and structural units, and the micro-level analysis of smaller units may reveal interrelationships that could remain hidden in macro-level studies. To examine the teacher's language elements of connection maintenance in the most relevant classroom units, I selected dialogue scenes from the lessons using a unique criterion system, focusing on those that most reflect frontal, multi-participant, teacher-directed classroom dialogues (referred to as dialogue scenes hereafter). The selection of scenes was based on the following criteria:

Discourse characteristics:

- The interaction in the scene involves at least two students, aside from the teacher.
- The dialogue scene is at least 7 speech turns long.
- The speech turns are related to a single topic/exercise throughout the interaction.

Methodological characteristics:

- The dialogue scene is observed during the frontal part of the lesson.
- The teachers use the discussion method in the dialogue scenes.
- The dialogue scene is related to the lesson's content.

Communication characteristics:

- Student activity is primarily linguistic.
- The dialogue scene is clearly distinguishable from the other scenes in the lesson based on didactic aspects.
- The dialogue scene is clearly distinguishable from other scenes in the lesson based on pragmatic aspects. For example, teacher speech acts at the beginning and end of the scene clearly mark the start and closure of the discussion (e.g., discourse markers, verbs).

I transcribed the dialogues from the lessons, segmented and annotated the transcriptions, and coded them. The analyses were carried out based on the segmented, annotated, and coded notes using the ELAN 6.7 speech analysis software. In identifying and analysing phatic language elements, I always considered the context and recognised the role of phatic elements in maintaining

connection through close textual analysis. In addition to identifying and analysing phatic elements, I also studied characteristics of the dialogue scenes such as their length, the ratio of teacher to student speaking time, and the average length of speech turns, making it possible to compare teachers' phatic communication with the general communication characteristics of the dialogue scenes. The statistical analyses necessary for analysing the relationships were performed using IBM SPSS Statistics software.

The full transcripts of the lessons' dialogue scenes (Appendix 1) can be found on the following website: Transcripts of the online synchronous lessons' dialogue scenes. (Appendix 1.)

5. Results

5.1. Discourse features of dialogue scenes in online synchronous and face-to-face lessons

The dialogue scenes appear in different numbers and durations on the lessons examined. The discourse features of the dialogue scenes in the lessons of the two learning-teaching settings are summarised in Table 3.

	Online synchronous lessons	**Face-to-face lessons**
Total length of dialogue scenes (s)	3486,18 s	4500,7 s
Total speech time in dialogue scenes (s)	3438,16 s	4649,4 s
Number of dialogue scenes in lessons (count)	14	24
Number of dialogue scenes (count) per lesson	1st lesson: 4 scenes 2nd lesson: 3 scenes 3rd lesson: 3 scenes 4th lesson: 4 scenes	1st lesson: 6 scenes 2nd lesson: 6 scenes 3rd lesson: 7 scenes 4th lesson: 5 scenes
Speech time (teacher, s / student, s)	2336,06 s / 837,46 s	3566,77 s / 1082,63 s
Number of speech turns (teacher, count / student, count)	184 / 165	395 / 369
Average length of speech turns (teacher, s / student, s)	14,65 s / 5,26 s	9,02 s / 2,93 s

Table 3. Discourse features of dialogue scenes

In the online synchronous lessons, 14 dialogue scenes were observed, with a total duration of about 3438 seconds. In the face-to-face lessons, 24 dialogue scenes appeared, totalling about 4649 seconds (Table 3). The duration of the scenes is not evenly distributed, and depends on the topic of the discussed dialogue scene, the task being discussed, the types of teacher questions, student activity, etc. (Appendix 1).

However, in general, it can be stated that communication asymmetry is a defining characteristic of the dialogue scenes in both learning-teaching settings, considering speech time, number of speech turns, and the average length of speech turns. The ratio of teacher and student speech time in the two settings is summarised in Figure 1.

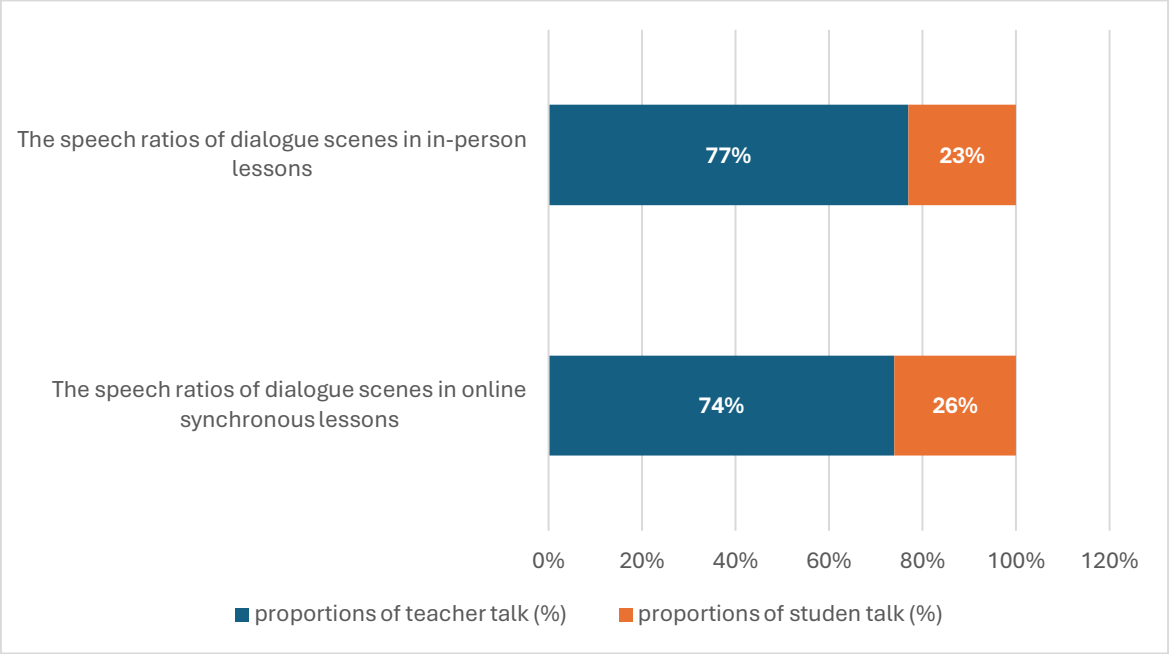

Figure 1. Speech time ratios in the dialogue scenes (n = 100% / learning context)

Teachers speak more than their students in the scenes: in the case of online synchronous lessons, the speech time distribution is 74-26%, while in face-to-face lessons, it is 77-23% (Figure 1). It is also important to highlight that while the teacher's speech time refers to one individual, the students' speech time is considered for the entire class. Therefore, speech time per student is always significantly lower (Antalné Szabó 2015; Asztalos 2020; Walsh 2006).

Although at different ratios, a similar trend can also be observed regarding the number of speech turns in the analysed dialogue scenes, as shown in Figure 2.

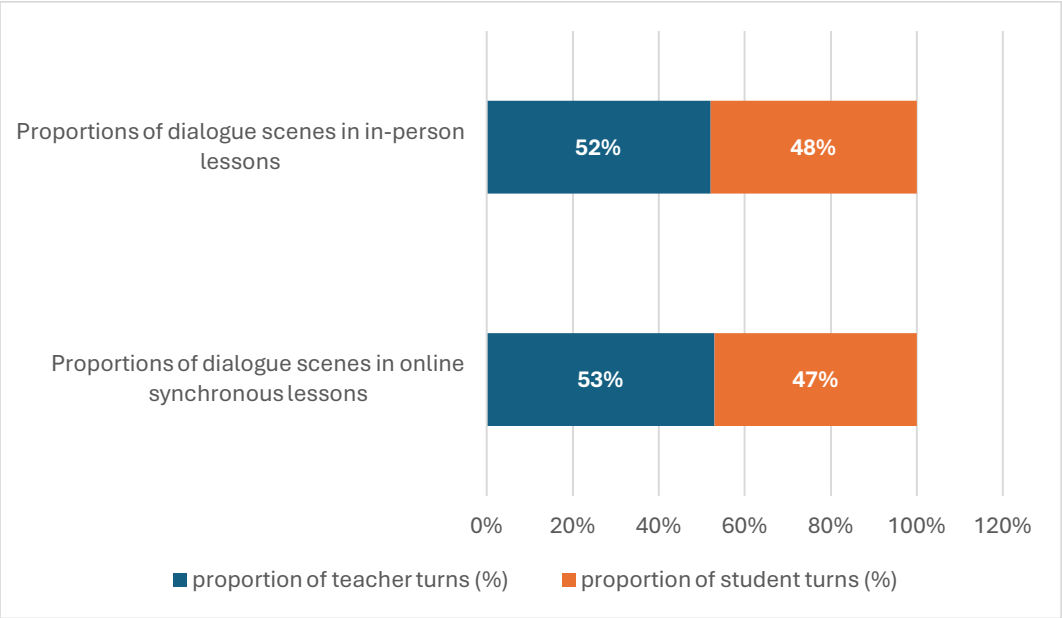

Figure 2. The ratios of speech turns in the dialogue scenes (n = 100% / learning context)

Although the distribution of speech turns appears more equal in terms of proportions compared to speech time distribution, the percentages should still be interpreted in such a way that the number of teacher speech turns refers to one individual, while the number of student speech turns is distributed among the entire class (Figure 2). In this way, the total number of student speech turns in both settings (165 and 369, respectively) represents very few speaking opportunities per student (Figure 2).

This asymmetry is also evidenced in the average length of speech turns in both learning-teaching contexts (Table 3). In the case of online synchronous lessons, teacher speech turns are, on average, 14.65 seconds long, while student speech turns are, on average, only 5.26 seconds long. This means that during a single speech turn, the teacher speaks about three times as long as a student. In the face-to-face lessons, the ratio is similar: the average length of teacher speech turns is 9.02 seconds, while student turns last only 2.93 seconds on average (Table 3).

5.2. Teachers' phatic language elements in online synchronous and face-to-face lessons

In the teachers' speech of the dialogue scenes analysed, it is generally the case that both purely phatic and supplementary phatic language elements can be observed. Figure 3 summarises the number of phatic language elements in the teachers' speech in both learning-teaching contexts (Figure 3).

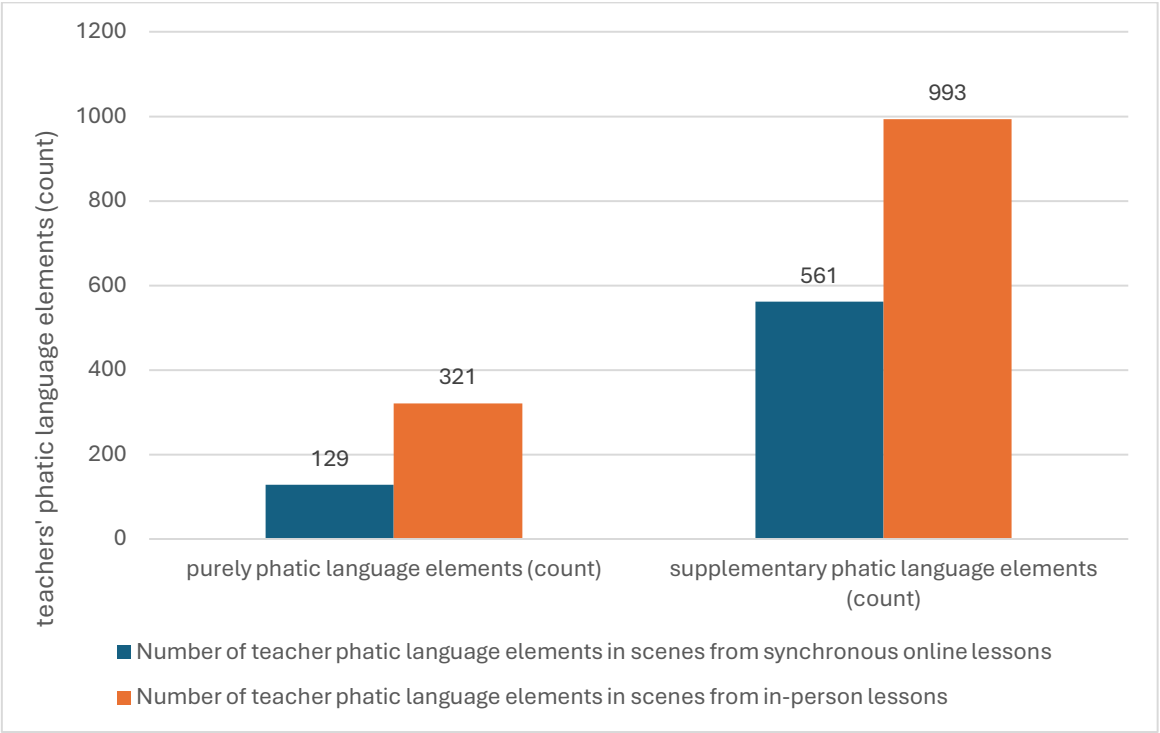

Figure 3. Number of teachers' phatic language elements in the dialogue scenes (n = 2004 items)

A total of 2004 phatic language elements can be found in the teachers' speech turns in the dialogue scenes of the two learning-teaching contexts. In the dialogue scenes of the online synchronous lessons, 450, while in the dialogue scenes of the face-to-face lessons, 1554 phatic language elements are found in the teachers' turns (Figure 3). However, these are not proportional data, and the phatic language element counts in the teachers' turns in the two learning-teaching contexts cannot be directly compared because the scenes have different lengths. It can, however, be stated that in both learning-teaching contexts, a higher proportion of supplementary phatic language elements can be observed than purely phatic language elements (Figure 3). This could be explained by the

basic characteristics of these two groups of phatic language elements: while purely phatic elements serve primarily to maintain the connection in communication, supplementary phatic language elements play pragmatic roles in the discourse alongside their phatic function. For example, verbs that also serve a phatic function might reflect teaching activities, task assignments, class organization, etc. in the classroom discourse (Asztalos 2022a; Hollóy 2025).

The question arises whether, in the dialogue scenes of online synchronous settings, teachers use more phatic language elements to compensate for the shortcomings of the digital communication setting. After adjusting the counts of language elements for proportionality, I checked the ratios of their appearance in both settings using an independent samples t-test. The results of the t-test show that there is no significant difference in the number of phatic language elements appearing in the teachers' speech in the dialogue scenes of online synchronous versus face-to-face lessons ($t = -1.742$, $p = 0.132$). Therefore, the online setting does not lead to a significantly higher number of phatic language elements in the teacher's turns.

5.2.1. Teachers' purely phatic language elements in online dynchronous and face-to-face lessons

Although purely phatic language elements appear in lower numbers than phatic elements with additional functions, they are an important part of teacher speech (Figure 3). The total number of purely phatic language elements in the dialogue scenes of the two learning-teaching contexts is shown in Table 4.

The number of purely phatic language elements in the teachers' speech turns in the dialogue scenes (n = 450 items)		
Greeting forms	Expressions substituting for greetings, well-wishes	Forms of address
0	0	450

Table 4. The number of purely phatic language elements in the teachers' speech turns in the dialogue scenes

Among the purely phatic language elements, only address forms can be observed in the teachers' turns in the dialogue scenes (Table 4). The reason of this could be that while greeting forms and expressions substituting for greetings are specifically used for initiating and closing communication (Balázs 1993; Hollóy 2024; Ivosavi–Vecsernyés 2022), address forms, in addition to initiating and closing communication, can also support maintaining the relationship in various ways in the classroom, such as during the turn-taking moments (Antalné Szabó 2015; Asztalos 2022a; Walsh 2006). Address forms used by the teachers can be categorised according to their parts of speech. The numbers for this categorization are shown in Figure 4.

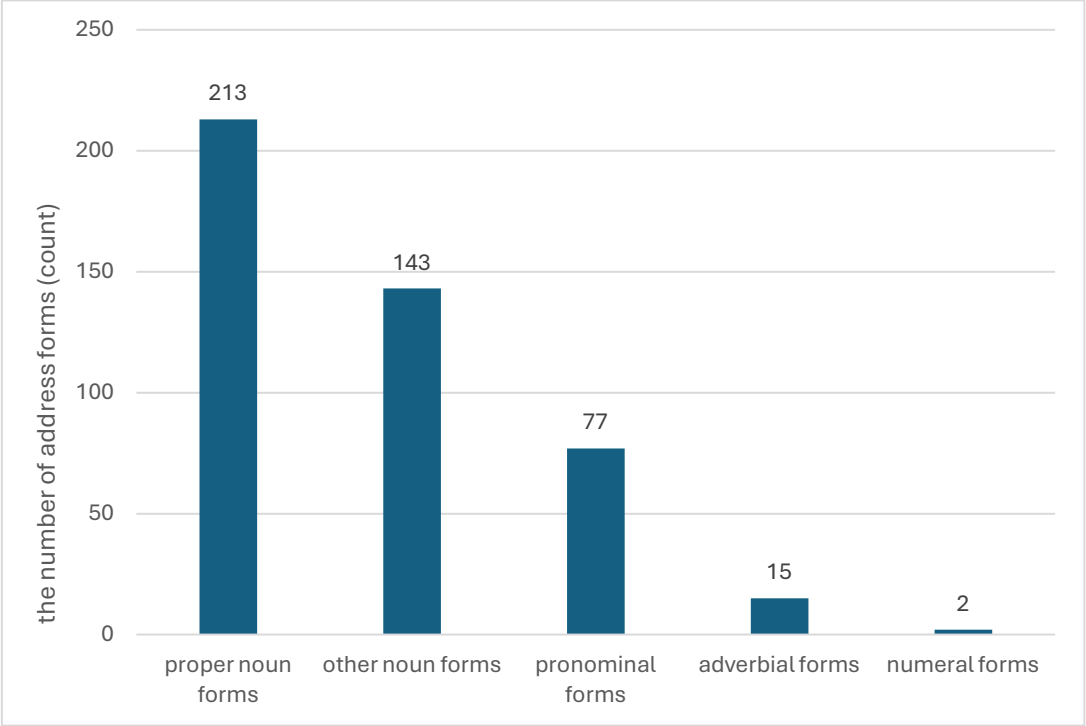

Figure 4. Types of address used by teachers in the dialogic scenes (n = 450 items)

Teachers most frequently prefer proper noun-based forms of address (213 instances, 47%), but a considerable number of common noun-based (143 instances, 31%) and pronominal addresses (77 instances, 17%) also appear. In addition, though less frequently, adverbial (16 instances, 4%) and numeral forms of address (2 instances) are also present in teacher utterances (Figure 4).

From a pragmatic perspective, forms of address fulfil two key functions within dialogues. Firstly, they facilitate turn-taking processes in dialogic exchanges: in most cases, teachers use various forms of address to designate the student(s) who should speak. All address types are suitable for turn allocation; teachers typically switch between them depending on whether they wish to engage one student or an entire group of students (Examples 1 and 2).

(1) T: Azt szeretném kérdezni, hogy hogyan lehetne ez befejezett melléknévi igenév, *Dániel*?
D4: Ahm, az elfáradt gyermek már alig tudott dolgozni, annyira elfáradt volt.
T: Nagyon jó, az elfáradt gyermek alig tudott már dolgozni, annyira elfáradt volt, szuper, jó. […] Okés, akkor még *Alexandrát* megkérdezem, hogy milyen szófajú szót írt…

(1) T: I'd like to ask, how could this be a past participle, Daniel?
D4: Uh, the tired child could hardly work anymore, they were so exhausted.
T: Very good! The tired child could hardly work anymore, they were so exhausted — great, well done. […] Okay, then I'll ask Alexandra what kind of word she wrote…

(2) T: … Érdekes ez is én azt gondolom, itt sok minden előfordulhat, az, amit már *ti* tapasztaltok a világból, ezt egyébként még írta *valaki* ezt az elfogadás dolgot, hogy kevésbé elfogadóak?

(2) T: …This is interesting too. I think a lot of things can happen here — what *you*'ve already experienced in the world. By the way, did *anyone* else write something about acceptance, like being less accepting?

In Example 1, the teacher uses proper noun forms of address in both instances of turn-taking to designate the student who is to speak. In contrast, in Example 2, the teacher first reflects on the previous student response using a first-person plural pronoun and then uses the indefinite pronoun *valaki* ('anybody') to signal that the next question is directed at the whole class, thereby broadening the focus of interactional engagement.

The second major function of forms of address in teachers' speech during the scenes is to maintain student attention during the monologic portions of the teachers' talk. During discussions in the scenes, numerous teacher explanations are observed: teachers often add short or extended explanations in response to student answers (Appendix 1). In these explanations, teachers frequently refer to individual students who previously responded, thereby guiding the class's attention to earlier segments of discourse, as shown by Example 3.

(3) T: Jó, *Ákos, Attila*, *Ákos* híven, ahogyan az előbb is elmondta, hogy nem nagyon tud majd megfogalmazni semmilyen rossz dolgot, de nagyjából így ketten maradtatok…

(3) T: Okay, *Ákos*, *Attila*, *Ákos*, just like you said earlier, that you probably won't be able to come up with anything negative, but roughly, it's just the two of you left…

Forms of address therefore serve two main purposes: on the one hand, they support turn-taking in classroom discourse, and on the other hand, they play a key role in directing shared attention, particularly during various teacher explanations.

5.2.2. Teachers' supplementary phatic language elements in online synchronous and face-to-face lessons

Supplementary phatic language elements appear in significant numbers in the teacher turns of the dialogue scenes from both learning-teaching contexts (see Figure 3). The total number of such elements in the dialogue scenes of the two settings is presented in Table 5.

Number of Supplementary Phatic Language Elements in Teacher Turns of the Dialogue Scenes (n = 1554 items)			
Verbs with supplementary phatic function	Discourse markers with supplementary phatic function	Possessive structures with supplementary phatic function	Fixed word combinations/reflective expressions with supplementary phatic function
717	555	61	221

Table 5. Number of supplementary phatic language elements in teacher turns in the dialogue scenes

Among supplementary phatic language elements, verbs (717 items, 46%) and discourse markers (555 items, 36%) occur most frequently in teacher utterances. To a lesser extent, fixed word combinations or reflective expressions (221 items, 14%) and possessive structures with supplementary phatic function (61 items, 4%) also appear (Table 5).

The high frequency of verbs with supplementary phatic function can be explained by the fact that verbs often support relationship maintenance in classroom discourse in addition to their other functions (Asztalos 2022a; Hollóy 2025). Any verb whose personal suffix indicates who the teacher is referring to through the represented action can be considered to carry a phatic function. Thus, verbs in the 2nd person singular (E/2), 3rd person singular (E/3), 1st person plural (T/1), 2nd person plural (T/2), and 3rd person plural (T/3) all contribute to phatic communication in the dialogue scenes (Asztalos 2022a; Hollóy 2025). Example 4 illustrates how such verbs function.

(4) T: Ühüm, ugye itt azért az orvoslást *pontosítsuk*, mert hogy én gondolom itt a nem feltétlen az orvostudományra *gondolsz*, hanem inkább így az egészségügy helyzetére, nem? Vagy?
D6: Hát igen-igen. […]
T: Aha, igen-igen, tehát ugye nagyjából így az infrastruktúra, kórházak állapota, ilyesmikre *gondolsz*, én feltételezem.
D6: Igen.
T: Jó, tehát akkor ez egy olyan oldal, ami lehet, hogy lehetne kicsit modernebb, vagy hát felkészültebb, az egészségügy. De gondolom, ezt *érzed*, ezt *látod*.

(4) T: Uh-huh, okay, *let's clarify* what *you mean* by "medicine" here, because I guess *you're not necessarily thinking about* medical science, but more about the state of healthcare, right? Or?
D6: Yeah, yes, that's right. […]
T: Ah, yes, yes, so *you mean* things like the infrastructure, the condition of hospitals, that kind of thing, I assume?
D6: Yes.
T: Okay, so this is an area that maybe could be a bit more modern, or better prepared, the healthcare system. But I guess that's what *you feel*, that's what *you see*.

In Example 4, the teacher begins a literature lesson by asking students about their attitudes to their homeland. The teacher adds follow-up questions and brief explanations to the students' thoughts. In the teacher's speech, the use of a first-person plural verb, *pontosítsuk* ('let's clarify') can be observed, which expresses an instruction: the teacher encourages the student to clarify or elaborate on their thought. Although the instruction is clearly directed at the student, the plural form emphasizes cooperation and shared reflection, thereby reinforcing the existing mental and interpersonal connection between teacher and student (Asztalos 2022a; Hollóy 2025) (Example 4). The other verbs with supplementary phatic function used in the teacher's utterances are in the second-person singular. These serve to reflect or summarise the student's ideas, signal continued contact, and guide other students' attention toward the content expressed by the previous speakers (Asztalos 2022a; Hollóy 2025) (Example 4).

Discourse markers are essential components of teacher talk. Numerous studies have shown the different functions these elements can fulfil in teacher discourse (Campbell-Larsen 2017; Schirm 2015). Based on the current analysis, it can be stated that discourse markers frequently take on a phatic function in the dialogue scenes from both online synchronous and in-person classes. The discourse markers with supplementary phatic function, along with their frequency, are summarised in Figure 5.

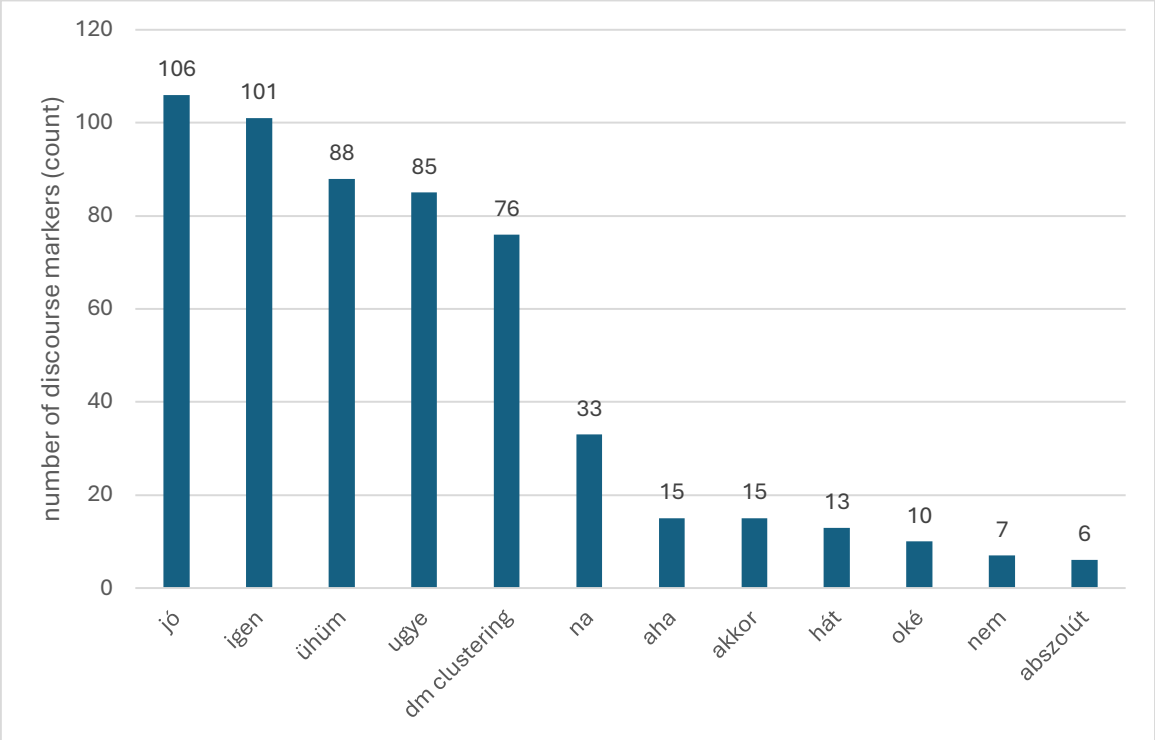

Figure 5. Discourse markers with supplementary phatic function in the dialogue scenes (n = 555 items)

Various discourse markers in teacher speech can support maintaining connection between teacher and student: the most frequently occurring ones in the teacher turns of the dialogue scenes are *jó* ('good', 106 instances, 19%), *igen* ('yes', 101 instances, 18%), and *ühüm* ('uh-huh', 88 instances, 16%). In addition, *ugye* ('right?') appears 85 times (15%), compound discourse marker forms 76 times (14%), and *na* ('well', 33 times, 6%) are also frequently observed (Figure 5). Discourse markers can support classroom phatic communication in many ways: they can help initiate a speech segment, draw student attention, manage turn-taking, support student speech in parallelas a backchannel cue, or allow teachers to reflect on what students have said (Asztalos 2022a; Hollóy 2025). Example 5 illustrates the role of discourse markers with supplementary phatic function in the mechanisms of turn-taking, while Example 6 shows their function in supporting student speech:

(5) T: Agymenés, *ühüm*. Szkenner. Ki mit talált a szkennerre? *Na*, D5-ék mondják.
D5: Hm, hát igazából, hm, a nyomtatóra találtuk ki, hogy másina, és akkor a fordított másina az a szkenner.
T: *Ühüm*, fordított másina…

(5) T: Brainstorming, *uh-huh*. Scanner. Who came up with something for the scanner? *Okay*, D5, you go.
D5: Well, actually, um, we thought of the printer first, and then the "opposite" of the printer is the scanner.
T: *Uh-huh*, the opposite of the printer…

(6) D4: Igen, szóval azt kihagytam belőle, hogy az a megfelelő tojás számára, amit olyan tyúk tojt *T: *Ühüm*.*, aki természetes magokon meg füveken, és nem tápot *T: *Igen*.*, mert annak valahogy nagyobb lesz a mésztartalma, és kevésbé törik.

(6) D4: Yes, so I left out that it's for the right kind of egg, the one laid by a hen *_T: Uh-huh._* that feeds naturally on grains and grass, and not on feed *_T: Yes._*, because that way the eggs have a higher calcium content and are less likely to break.

In Example 5, the two *ühüm* ('uh-huh') markers reflect on the student's response, indicating that the teacher was listening, and the communicative connection was maintained. The *na* ('okay') helps facilitate turn-giving: it signals the teacher's attention and, along with the form of address, prompts students to begin speaking (Example 5). In Example 6, the two phatic discourse markers ('uh-huh, yes') appear simultaneously with the student's speech: here, the teacher does not take over the turn but signals ongoing mental engagement and expresses a positive attitude toward the student's answer.Possessive structures with supplementary phatic function involve nouns with possessive markers – typically first-person plural – which reinforce a sense of community with the class in the teachers' speech. This phenomenon is illustrated by the teacher's turn in Example 7.

(7) T: Na, akkor a mai alkalommal a múlt órán lezárt egyszerű mondatról szóló *egységünk* után az összetett mondatról elmondandókra váltanánk át.

(7) T: Okay, so for today's session, after finishing *our unit* on simple sentences last time, we'll move on to what we need to cover about complex sentences.

In Example 7, the word *egységünk* ('our unit') with a first-person plural possessive marker signals the teacher-student relationship and emphasizes joint work. The teacher refers to the material as a shared unit, thereby strengthening a sense of community and mental connection with the class (Example 7).

Fixed word combinations/reflective expressions with supplementary phatic function primarily appear in evaluative teacher utterances. These are established language elements that often appear repeatedly in teacher speech (Grund 2021). In such cases, although their evaluative and motivating value may decrease, their phatic function remains constant, as they signal the teacher's attention to the student (Antalné Szabó 2006; Hollóy 2025), which is demonstrated by Example 8.

(8) T: Némajáték. Van-e valakinél ennek megfelelő idegen szó? Igen?
D5: Pantomim.
T: *Nagyon jó*! […] Kinél van magyar szó? D7?
D7: Szókép.
T: Szókép. Idegen párja a...
D8: Metafora.
T: Metafora, *nagyon jó*! Gyere!...

(8) T: Charade. Does anyone know a foreign word for this? Yes?
D5: Pantomime.
T: *Very good*! […] Who has the Hungarian word? D7?
D7: Szókép.
T: Szókép. Its foreign equivalent is…
D8: Metaphor.
T: Metaphor, *very good*! Come on up!

In this example, *nagyon jó* ('very good') appears twice as a fixed evaluative phrase with a phatic function, both times signalling correctness. Despite being evaluative, its repetitive use reduces its motivational value, since it does not provide detailed feedback on the answers. However, the phatic function is still relevant, as such feedback shows students that the communicative connection is ongoing.

5.3. The relationship between teachers' phatic communication and student talk

This section examines the impact of teachers' phatic communication on student speech from two perspectives. First, it explores the correlation between the number of phatic language elements used by the teacher and the number of student turns. Second, it investigates the potential effect of teachers' phatic communication on student speaking time. Both relationships are analysed using Pearson correlation tests.

The results show a presumed correlation between the number of teacher phatic elements and the number of student speaking turns ($r^2 = 0.778$, $p = 0.023$). However, the Pearson test does not indicate a correlation between phatic communication and the average length of student turns ($r^2 = 0.239$, $p = 0.568$). Example 9 helps interpret these results.

(9) T: …Már jöhet is a következő magyar szó. *D3*, *nálad*?
D3: Nálam nem magyar szó van.
T: *Nálad* idegen szó van. *Kinél* van magyar szó? *D4*?
D4: Szókép.
T: Szókép. Idegen párja a...
D5: Metafora.
T: Metafora, *nagyon jó*! *Gyere*! Következő magyar *szavunk*?
D5: Ide alá?
T: *Igen*, oda, *légy szíves*. *D6*!
D6: Szerelőhelység.
T: Szerelőhelyiség.
D7: Szerviz.
T: Szerviz. *Gyere te* is!

(9) T: …Next Hungarian word, please. *D3*, *yours*?
D3: I don't have a Hungarian word.
T: *You* have a foreign word. *Who* has a Hungarian word? *D4*?
D4: Szókép.
T: Szókép. Its foreign equivalent is…
D5: Metaphor.
T: Metaphor, *very good*! *Come on up*! Next Hungarian word?
D5: Under here?
T: *Yes*, *right there*, *please*. *D6*!
D6: Szerelőhelyiség.
T: Szerelőhelyiség.
D7: Szerviz.
T: Szerviz. *You come up too*!

The example shows the various types of phatic language elements in teacher speech: the teacher uses forms of address, verbs, and possessive constructions with phatic functions to manage turn-taking and uses fixed expressions and reflective phrases to respond to student answers. These elements greatly support turn-giving and turn-taking, and thus likely aid in engaging more students in classroom dialogue (Example 9). However, it is also evident that student responses tend to be very brief, often limited to single words. In this classroom context, this does not imply student passivity or the lack of phatic communication by the teacher: many students actively participate in the task-checking process, and their answers are adequate, as the task often requires only one-word responses. Therefore, a direct correlation between phatic communication and the length of student speech is unlikely, as other factors (topic, question types, etc.) may have a stronger influence.

6. Conclusion

This study examined teachers' phatic communication in dialogue scenes from online synchronous and in-person lessons, focusing on the language elements of connection maintenance in teacher speech. It briefly presented the importance of the phatic function for effective communication and highlighted its role in classroom discourse. The study summarised the discourse features of the analysed scenes and the phatic language elements used by teachers, illustrating their pragmatic role through examples. It also investigated whether teachers used more phatic elements in the digital learning-teaching space to maintain more effective communication and whether there is a relationship between teachers' phatic communication and student speech.

The first hypothesis – that communicative asymmetry characterises dialogue scenes in both teaching-learning environments – was confirmed. In teacher-centred classroom segments, regardless of environment, teachers speak more frequently and at greater length than students. The second hypothesis was also confirmed: the majority of the teacher turns in dialogue scenes features a high number of phatic language elements. These elements permeate teacher discourse, guiding turn-taking, reflecting on student responses, and drawing student attention. Sub-hypothesis 2a was also validated: supplementary phatic language elements are more frequently observed in the majority of teacher turns than purely phatic language elements. However, sub-hypothesis 2b was not confirmed: in the analysed online synchronous lessons, there was no evidence of an increase in the number of phatic elements in teacher speech, suggesting that teachers did not attempt to counteract the digital communication gap caused by the COVID-19 pandemic in this way.

Finally, the third hypothesis was only partially confirmed: while teachers' phatic communication likely correlates with the number of student turns, it does not appear to have a direct effect on student speaking time. Phatic elements significantly support turn-taking and thus help engage students in interaction. However, student speaking time is influenced by many other variables, and a direct connection is therefore not assumed.The results of the study cannot be considered representative due to the small size of the corpus, but they do offer a highly nuanced picture of classroom discourse and teacher communication while also suggesting trends and potential future research directions that may justify further, more detailed analyses. The results may also be useful for teacher candidates and in-service teachers, as they can contribute to greater professional self-reflection and form the basis for conscious discourse strategies that support effective classroom interaction. The continuation of this research is being carried out within the framework of the umbrella project *Language Use at an Advanced Level* operating under the ELTE Centre for Digital Education Development and Competence, where I examine the phatic communication of teacher trainees within a larger video and written corpus specifically based on their microteaching sessions. This broader empirical study, grounded in microteaching, expands and refines the findings presented in the current paper and identifies both strengths and areas for improvement in the phatic communication of teacher trainees. The additional research results will serve as a foundation for the development work conducted within the project, including online workshops and the creation of digital learning materials. The findings of this study, along with the outcomes of further research, contribute to the communicative development of both teacher trainees and practicing teachers. Conscious use of phatic language elements can foster more interactive dialogue between teacher and students, leading to more effective collaboration and learning.

Acknowledgements

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related to oral communication within the teaching and learning contexts of higher education. Second, it seeks to develop an assessment tool suitable for examining oral communication in these settings, along with analysing communicative activities through the lens of discourse analysis. Finally, the project involves the creation of digital learning materials designed to enhance the oral communication skills of both instructors and students, with these materials being implemented through online workshops (Gonda–Hollóy 2025). A key priority of the project is the development of professional oral communication skills in teacher trainees, to which this study contributes both theoretically and empirically.

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HOW WORKING MEMORY DEVELOPMENT INFLUENCES RECURSIVE STRUCTURE PRODUCTION

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Abstract

The aim of this study was to investigate the relationship between working memory and the production of recursive linguistic structures in language acquisition. Particular attention was paid to the ability of children of different ages to produce these complex structures. The following questions were posed: To what extent are children able to produce recursive possessives, relative clauses and complex postpositional structures? How does working memory capacity affect the use of recursive linguistic structures?

We hypothesised that the development of working memory would be closely related to the rate of language development and that children aged 7–8 years would perform significantly better than younger age groups in the production of recursive structures. In contrast, the results of this study showed that not only age or sentence length, but also the complexity of the structures played a key role in children's performance. Relative clauses (RCs), which are the longest of the three structures, performed better on memory tests than complex postpositional structures (PPs), which are shorter but require more complex semantic relations. These findings provide a new perspective for understanding children's language development and the acquisition of recursive structures.

Sections 1, 2, 3 and 4 discuss the relationship between working memory and language, and the concept of recursion. This is followed by a detailed description of experiments (Section 5) that analyse the acquisition of recursive structures by children of different ages. Section 6 discusses the research findings and their implications, highlighting the role of working memory development in the development of language skills.

Keywords: working memory, production, language acquisition, recursive possessives, relative clauses, complex PPs

1. Introduction

At the interface between linguistics and cognitive science, there is increasing attention to the study of the links between the development of working memory and the acquisition of language structures. Working memory, which refers to the ability to store and process information in the short term, plays a key role in language comprehension and production (Baddeley–Hitch1974). In particular, recursive structures, which make it possible to increase the complexity of linguistic expressions, are considered a fundamental element of language ability (Hauser et al. 2002).

During children's language learning process, it can be observed that working memory capacity is closely related to the rate and quality of language structure acquisition. Research by Racsmány et al. (2005) shows that children's working memory capacity increases with age, allowing them to acquire increasingly longer and more complex linguistic expressions.

The aim of the present study is to investigate the impact of working memory development on the acquisition of recursive language structures, with particular attention to age-related differences in children. The following sentences are examples of recursive structures:

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(1a) *A bácsi* *feleség-é-nek* *a bicikli-je*
the man wife-Poss-DAT the bicycle-Poss
'The man's wife's bicycle.'

(1b) *A macska* *az oroszlán* *előtt* *ül,* *ami* *az elefánt* *fölött van*.
the can the lion in front of sit-3sg which the elephant above is
'The cat sits in front of the lion that is above the elephant. '

(1c) *A macska* *az elefánt* *fölötti oroszlán* *előtt* *ül*.
the cat the elephant above lion in front of sit-3sg.
'The cats sits in front of the lion above the elephant.'

The research examines the production of three recursive structures – recursive possessives (1a), relative clauses (RCs) (1b) and complex postpositional structures (PPs) (1c) – and the results provide a broader picture of how working memory capacity influences language development.

2. Working memory and language

The role of working memory in language processing has received increasing attention in psycholinguistic research. Working memory, as the ability to store and process information in the short term, is essential for language comprehension and production because it allows the temporary storage and manipulation of information generated during speech (Baddeley–Hitch 1974).

Baddeley's model of working memory is based on three main components: the phonological loop, the visuospatial scratchpad and the central executive. The phonological loop is particularly important for the short-term storage of verbal information such as words and sentences, while the central executive controls the functioning of the subcomponents and allows the manipulation of incoming information (Baddeley 2000). The efficient functioning of these components is essential for children to acquire more complex linguistic structures such as recursive sentences.

Just and Carpenter (1992) suggest that individual differences in language processing are due to limited working memory capacity. Children with greater working memory capacity are able to construct and analyse multiple possible meanings simultaneously, which contributes to more successful solutions to complex language tasks. This research shows that the development of working memory is closely linked to the process of language acquisition.

Racsmány's et. al. (2005) experiments show that children's working memory capacity increases with age, making it easier for them to understand and reproduce longer and more complex linguistic expressions. Research shows that working memory not only affects word learning, but also plays a crucial role in syntactic tasks. Children with higher working memory capacity are better able to imitate adult sentence structure and thus develop long-term templates for linguistic expression.

This paper also addresses the fundamental question of how working memory development contributes to the acquisition of recursive language structures, a key component of language faculty.

3. The impact of verbal working memory development on language acquisition

The development of verbal working memory is closely linked to the process of language acquisition, a conclusion that is supported by a substantial body of research. As demonstrated by Racsmány et. al. (2005), children's verbal working memory capacity increases with age, thereby facilitating the acquisition of longer and more complex words, phrases and sentences. This process is fundamental to language development, as children's verbal memory plays a pivotal role in the acquisition of vocabulary and sentence structures.

Some researchers, such as Gathercole and Hitch (1993), posit that younger children have a constrained short-term memory capacity, leading to a tendency to reiterate the target stimuli persistently. However, spontaneous repetition of the target stimuli is no longer observed in children aged 7–8 years. These observations indicate that working memory capacity has a substantial influence on the efficacy of language processing.

In the process of acquiring new vocabulary, the phonological loop serves to maintain the representation of the new word until such time as a permanent memory trace is formed. The correlation between working memory and word learning is not only evident during the early stages of childhood, but also persists up to the age of 14 (Racsmány et al. 2005). The results indicate that children who perform better on verbal working memory tests also perform better on syntactic tasks. This suggests that the development of working memory contributes to the development of syntactic competence.

The findings of this research indicate that the development of verbal working memory is closely associated with the process of language acquisition. Children with higher working memory capacity are better able to comprehend and construct longer and more intricate sentence structures, which in turn facilitates the advancement of their linguistic abilities. An understanding of this process may prove invaluable in the field of language teaching, as the development of working memory can facilitate improvements in children's language performance.

The following section will examine the concept of recursion and demonstrate how verbal working memory facilitates the acquisition of recursive language structures.

4. Recursion

Recursion represents a fundamental aspect of linguistic structures, enabling the production of complex sentences and phrases from a finite set of elements. The faculty of language in a broad sense (FLB) comprises a set of systems that build on the sensorimotor and conceptual-intentional dimensions. In contrast, the faculty of language in a narrow sense (FLN) is a set of abstract linguistic computational systems. These systems permit the generation of potentially infinite expressions from a finite number of elements, as postulated by FLN theory. Indeed, as posited by Chomsky and colleagues (Hauser et al. 2002), recursion represents a pivotal element of the faculty of language in a narrow sense (FLN), which is indispensable for grasping the distinctive characteristics of human language.

The recursive nature of language permits the embedding of phrases ad infinitum, thereby endowing human language with the capacity to generate highly complex expressions. The absence of this mechanism is a defining characteristic of human language, in contrast to animal communication, which typically lacks recursive structures. It can be argued that recursion represents a fundamental feature of human language, contributing to linguistic creativity and the expression of complex meanings.

The merge operation, as proposed by Chomsky, whereby larger units are created from smaller linguistic elements, plays a pivotal role in the construction of syntactic structures. An understanding of the asymmetric nature of the merge operation, which allows the creation of syntactic objects (phrases), is essential to the exploration of the structure of language (Chomsky 1993).

The concept of recursion in linguistics can be interpreted in a number of ways, which are important to distinguish. The differences between Chomsky's merge operation and more specific phrase embeddings assist in comprehending the processes through which linguistic structures are formed and operate.

The merge operation proposed by Chomsky (1993) represents a fundamental building block of syntactic structures. In a merge, two elements are combined to create a new syntactic object. These elements may be a lexical unit (e.g. a word) or an existing syntactic object. The aforementioned process can be illustrated as follows:

> In the context of two given entities, designated as a and b, the merge operation generates a novel entity, g, which is defined as g = {d{a,b}}. Here, d represents the label of the newly formed structure.

The asymmetric nature of the merge operation is of paramount importance, as it enables the formation of a syntactic hierarchy, whereby the newly created unit (d) functions as a label for the syntactic structure, while the additional elements (a and b) constitute its constituents. It can be seen, therefore, that the merge operation is not only necessary for the construction of linguistic expressions, but also forms the basis for the generation of syntactic structures.

A more detailed analysis of recursion can be seen within the context of phrase arrangement. In this context, recursion denotes the hierarchical embedding of syntactic structures, whereby a syntactic component of a specific type (e.g. possessive or relative clause) is embedded in a syntactic phrase of a comparable type. This approach permits the construction of complex linguistic structures comprising an infinite number of phrases (e.g. 1a, b and c).

The syntactic embedding of the possessive structure (1a), the relative clauses (1b) and the complex postpositions (1c) demonstrate how more complex structures can be created from existing elements. The objective of this article is to examine the connection of the acquisition of these three structures and working-memory development.

The principal distinction between Chomsky's concept of merge and the more precise notion of phrase structure recursion is that, whereas merge describes the process of combining syntactic elements, the latter is essential for grasping the hierarchical and intricate structure of linguistic expressions.

As a fundamental structural feature of language, recursion exerts a considerable influence on the process of language acquisition. In the context of children's language development, the acquisition of recursive structures typically occurs at a later stage than the acquisition of basic language elements. The comprehension and utilisation of recursive sentence structures are inextricably linked to the advancement of working memory, which facilitates the formation of more intricate linguistic expressions in children.

Furthermore, this section emphasises that the acquisition of recursive structures constitutes a pivotal aspect of the development of linguistic competence, a point that will be substantiated by the findings of our experiments in subsequent sections.

5. The experiments

In this section, four experiments are presented, three of which investigate the acquisition of the production of three recursive structures, while the fourth is a working memory test applicable to all three structures.

It is already established that recursive structures emerge at a relatively late stage in the acquisition process. The extant cross-linguistic literature (Roeper–Oseki 2018; Hollebrandse–Roeper 2014) suggests that, although the onset of production of recursive structures may vary across structures and languages, production typically commences between 7 and 9 years of age.

Several factors may account for this delayed emergence, including the development of children's working memory capacity, as well as the complexity and length of recursive structures. With respect to structural complexity, all three target structures (1a, b, and c) involve the same number of actors (e.g. man – wife – bicycle; cat – lion – elephant) and exhibit embedding, rendering them comparable in terms of hierarchical complexity.

At the same time, the three structures differ in the grammatical means by which recursion is expressed. Recursive possessives and complex postpositional structures primarily rely on morphological marking, such as case suffixes and postpositions, whereas relative clauses express recursion through functional elements, most notably relativizers. Thus, while the structures are

comparable in terms of hierarchical complexity and number of thematic roles, they differ in their morphosyntactic realization.

In addition to these grammatical differences, the three structures also vary in length. If structural length — operationalized as the number of words children are required to produce — plays a decisive role in the acquisition of recursive structures, a specific order of acquisition can be predicted. Two predictions are formulated as explicit, testable hypotheses in the following section.

5.1. Hypotheses

H1 (Complexity-equivalence hypothesis):
If hierarchical complexity is the primary determinant of acquisition, no systematic differences are expected across the three structures.

H2 (Length-based acquisition hypothesis):
If the length of a recursive structure is a decisive factor in the acquisition process, children will acquire recursive possessives earlier than complex prepositional phrases, and complex prepositional phrases earlier than relative clauses.

5.2. Participants

A total of 213 children between the ages of 4 and 9 participated in the trials. Of these, 69 children participated in the experiment testing complex PPs, which included kindergartners and school students between the ages of 4 and 8.

	N	mean age	sd
4-year-olds	10	4;5	0.65
5-year-olds	14	5;6	0.36
6-year-olds	13	6;5	0.24
7-year-olds	18[1]	7;5	0.36
8-year-olds	14	8;4	0.29

Table 1. Participants – complex PPs

A total of 72 children participated in the experiment to test the acquisition of relative clauses. The participants were divided into five age groups ranging from 4 to 8 years of age.

	N	mean age	sd
4-year-olds	11	4;0	0.49
5-year-olds	10	5;7	0.312
6-year-olds	18	6;6	0.43
7-year-olds	15	7;6	0.35
8-year-olds	18	8;5	0.36

Table 2. Participants – relative clauses

The recursive possessive structure acquisition experiment involved 72 children, who were divided into five age groups from 4 to 8 years old.

[1] At the age of eight, a greater proportion of children have completed the task. This finding is based on the number of second graders in the class. The decision not to reduce the number of children was taken so as not to exclude any participants who were capable of completing the task. The sole criterion applied was the attainment of a minimum of 10 children within each age group.

	N	mean age	sd
4-year-olds	13	4;4	0.65
5-year-olds	10	5;8	0.36
6-year-olds	16	6;5	0.24
7-year-olds	14	7;8	0.36
8-year-olds	19	8;5	0.29

Table 3. Participants – recursive possessives

A total of 108 children participated in the working-memory test. In order to ascertain how the data varied between ages 8 and 9, it was necessary to include 9-year-olds as well. The 9-year-olds were actually the 8-year-olds in the earlier three structure experiments.

	N	mean age	sd
4-year-olds	23	4;4	0.24
5-year-olds	18	5;5	0.62
6-year-olds	15	6;10	0.39
7-year-olds	18	7;3	0.25
8-year-olds	15	8;6	0.36
9-year-olds	19	9;3	0.55

Table 4. Participants – working-memory test

The duration of each trial was 20-30 minutes, depending on age. Responses were recorded on camera for subsequent review and analysis.

5.3. Methodology

The methodological approach was determined by the aim of the research, which was to explore the relationship between working-memory and the acquisition of recursive language structures.

5.3.1. The methodology of the experiments on the acquisition of the three recursive structures

The methodology of the experiments conducted for the acquisition of the three recursive structures is outlined below. For the complex postpositional structure and relative clauses, a wooden bus and cardboard animals were utilised. Prior to the commencement of the experiment, it was ascertained that the children were familiar with the animals. The bus was then presented, with emphasis placed on the observation of details, particularly the disparities between the front and rear of the vehicle. The experimental framework entailed a narrative premise, in which the animals embarked on a journey, with the children's role being to ensure the correct animals were seated on the bus.

The experiment encompassed eight preliminary tasks, eight test sentences, and eight filler sentences. The purpose of the preliminary tasks was to facilitate the children's comprehension that the experimenter would introduce an animal and they would be tasked with determining its designated seat. During the warm-up test, the experimenter made a true statement in four instances and a false statement in one (e.g. *the frog sat down above the pig*, but it was claimed that *it sat down under the pig*). In total, five bus journeys were acted out, and the participants were informed in advance which animals would eat what. Each participant was assigned a specific food item that matched their predilection (e.g., a dog was assigned a bone, a cat was assigned milk, etc.). The experimenter's role entailed providing the animal with its designated food and subsequently guiding it to the location where the food had been placed.

In each trial, an alternative option was made available to the children, (e.g. there was visual stimuli about the place: in front of the pig (that is) under the dog instead of in front of the pig that is under the elephant).

Figure 1. The visual layout of the experiment on complex postpositions and relative clauses

As illustrated in Figure 1, the arrangement of elements on the bus is represented by the following example: the fly and the cheese symbolise the test elements, with the fly being consumed by the frog, thereby occupying the position in front of the pig under the elephant. Upon observing the participant's placement of the animal, the experimenter inquired about its designated location. The majority of respondents indicated that the animal had been positioned *in front of the pig*. The experimenter then pointed out that there was another pig on the bus that was under the dog, and asked again where they had seated the frog. They answered that it was ideally *in front of the pig under the elephant*, or *in front of the pig that is under the elephant*.

In the recursive possessive study, a wooden house (Figure 2) contained various fairy tale creatures, their animals, and various foods and ingredients of the animals.

Figure 2. The visual layout of the experiment on recursive possessives

The narrative was about a plush doll's birthday celebration, where the children were tasked with baking a cake for the doll. During the experiment, while the researcher collected ingredients from the doll's house, the children were instructed to say who did the items selected and placed in their basket belong to. In the course of the study, we structured the tasks in a sequential manner, with the children progressing from the upper levels of the house to the lower levels.

The purpose of these preliminary tasks was to ensure that the children comprehended the subsequent task and to encourage the application of possessive language in their responses to the experimenter's questions. The experimenter was instructed to refrain from using possessive language during the test tasks, but was permitted to pose additional questions. For example:

(2) Experimenter: *Now, tell me what we took!*
Participant: *The apple.*
E: *OK, but who does the apple belong to?*
P: *The duck.*
E: *And who does the duck belong to?*
P: *To the witch*.
E: *Then what have we taken?*
P: *The witch's duck's apple*.

After gathering the necessary ingredients, a simulated baking process was carried out, and the cake was given to the dummy.

5.3.2. Methodology of memory tests fitted to the three recursive structures

Two distinct methodologies were employed in the memory test: one measured digit span and the other measured sentence repetition. The digit span test, as articulated by Racsmány et al. (2005), is an in-depth assessment of short-term memory capacity and functions as an exemplary evaluation of declarative memory, drawing upon Ullman's (2001) model. Participants were tasked with memorising sequences of numbers devoid of any discernible regularities.

The memory test was designed to assess children's short-term memory and language processing abilities. Racsmány et al. (2005) provide insight into a more detailed exposition of the Hungarian digit span test. However, it should be noted that this method alone does not provide a comprehensive picture of the success of children aged four to nine years in repeating sentences with different syntactic structures, and therefore an additional methodology had to be developed.

The average number of syllables in the test sentences was counted. The results obtained are as follows: 13 syllables (3a) for postpositional structures without instructions, 17 (4a) for the relative clauses and 10 syllables (5a) for recursive possessives. Utilising these data, number sequences of 17, 13 and 10 syllables were constructed.

The presentation will follow the order outlined in the paper: it starts with digit span and sentence repetition tests focusing on postpositional structures (3a–b), continues with results on relative clauses (4a–b), and ends with recursive possessives (5a–b).

(3a) *A nyuszi (üljön le)* *az egér* *előtti* *medve fölé.* (13 syllables)
the rabbit (should sit down) the mouse in front of bear above
'The rabbit should sit down above the bear in front of the mouse.'

(3b) *tizenkettő,* *tizenkilenc,* *három,* *tizenegy* (13 syllables)
twelve, nineteen, three, eleven

(4a) *A majom* *a malac elé* *(ült le),* *ami* *az elefánt* *alatt van.*
the monkey the pig in front of (sat down) that the elephant under is
'The monkey sat down in front of the pig that is under the elephant.' (17 syllables)

(4b) *tizenkettő,* *tizenkilenc,* *tizenhárom,* *tizenöt,* *kilenc* (17 syllables)
twelve, nineteen, thirteen, fifteen, nine

(5a) *(Tegyük a dobozba)* *a király* *kutyá-já-nak* *a liszt-jé-t!* (10 syllables)
Let's put the box-IN the king dog-Poss-DAT the flour-Poss-Acc
'Let's put the king's dog's flour into the box.'

(5b) *tizenhárom,* *tizenkilenc,* *kettő* (10 syllables)
thirteen, nineteen, two

Based on the obtained syllable counts, we created numerical sequences ((3b), (4b), (5b)) and sentences with matching syllable patterns. The sentences can be further divided into those that meet the criteria for recursive tests ((6a), (7a) and (8a)) and those that do not exhibit recursive embedding ((6b), (7b) and (8b)).

(6a) *A nyuszi (üljön le)* *az egér* *előtti* *medve fölé.* (13 syllables)
the rabbit (sit down) the mouse in front of bear above
'The rabbit should sit down above the bear in front of the mouse.'

(6b) *A Télapó* *ajándék-ot* *tesz* *a csizmá-ba.* (13 syllables)
Santa Claus present-ACC put-3sg the boot-ILL.
'Santa Claus puts presents into the stockings.'

(7a) *A majom* *a malac elé* *(ült le),* *ami* *az elefánt* *alatt* *van.*
the monkey the pig in front of (sit down) that the elephant under is
'The monkey sat down in front of the pig that is under the elephant.' (17 syllables)

(7b) *A tanító néni* *írás-ra* *tanítja* *a diák-ok-at.* (17 syllables)
the teacher write-SUBL teach-3sg the student-Pl-ACC
'The teacher teaches the pupils to write.'

(8a) *(Tegyük a doboz-ba)* *a király* *kutyá-já-nak* *a lisztjét!*
(Let's put the box-IN) the king dog-Poss-DAT the flour-Poss-ACC
'Let's put the king's dog's flour into the basket.' (10 syllables)

(8b) *A boszorkány* *macská-ja* *fekete.* (10 syllables)
the witch cat-Poss black
'The witch's cat is black.'

The experiment comprised a total of four complex PP sentences, four relative clauses and four recursive possessives. The remaining four sentences were devoid of embedding, and solely corresponded in syllabic count to the test sentences (6b, 7b, and 8b).

Participants were provided with a list corresponding to either PP only, RC only, or recursive possessive only. This approach enabled children to apply the language structures in the appropriate context. The subsequent section will focus on the discussion of the results, where a detailed analysis will be provided on the participants' performance in the different tasks.

5.4. Results

In this subsection, a summary of the results on the production of complex PPs, relative clauses and recursive possessives is provided. The objective of this research endeavour was twofold:

firstly, to explore the means by which children acquire these linguistic structures, and secondly, to investigate the differences between children of different ages.

5.4.1. Results of the acquisition of the three recursive structures

Firstly, the focus will be on the correct, recursive answers. In the experiment, two comparisons were made per condition: the first one always included the complete relative clauses (RCs), while the second one included the production of relative clauses aggregated with the dialogue-sensitive responses (see charts 1 and 2).

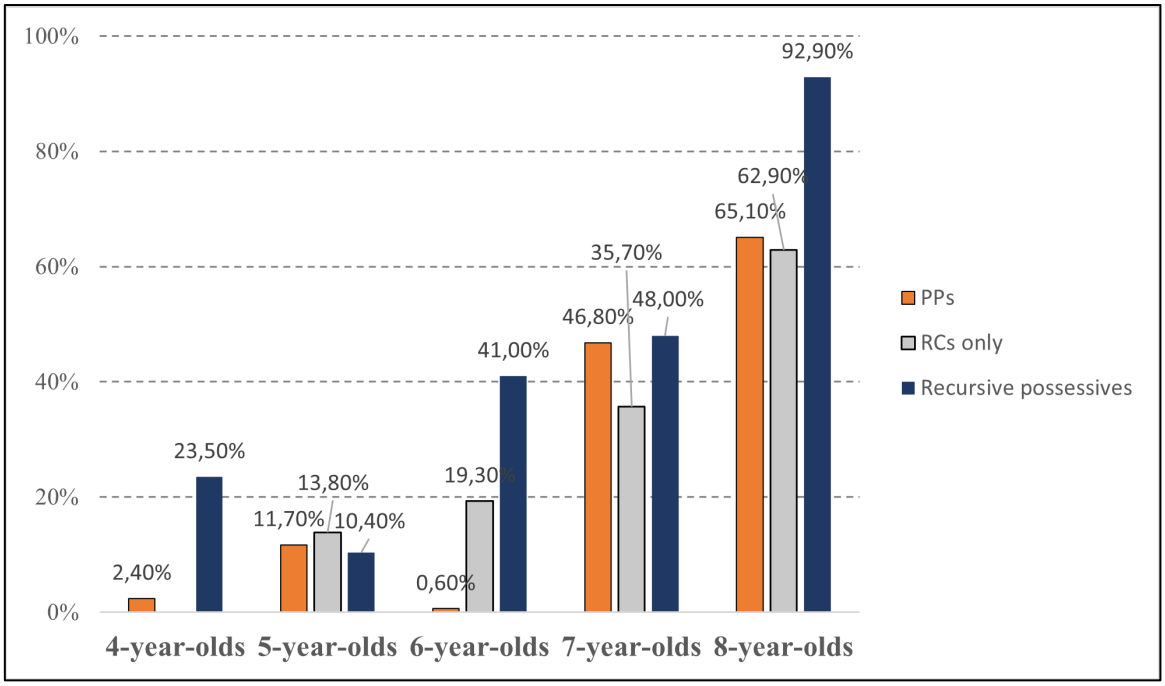

Chart 1. Correct answers of the 3 structures

As illustrated in Chart 1, four-year-olds demonstrate an ability to produce the entire structure in the recursive possessive. However, no significant difference is observed between the rates of successful production of the three structures in the five- and seven-year-old groups. Conversely, the six[2]- and eight-year-old[3] groups demonstrate a marked tendency to produce accurate responses for recursive possessives, in contrast to their responses for RCs and complex PPs.

In Chart 2, the recursive responses of the experiment for RCs are now aggregated with the relative clauses produced as a whole and the dialogue-sensitive responses. Consequently, the production of RCs has shown an increase.

[2] $\chi^2(1) = 7.8091$, $p < 0.01$**
[3] $\chi^2(2) = 7.5947$, $p < 0.05$*

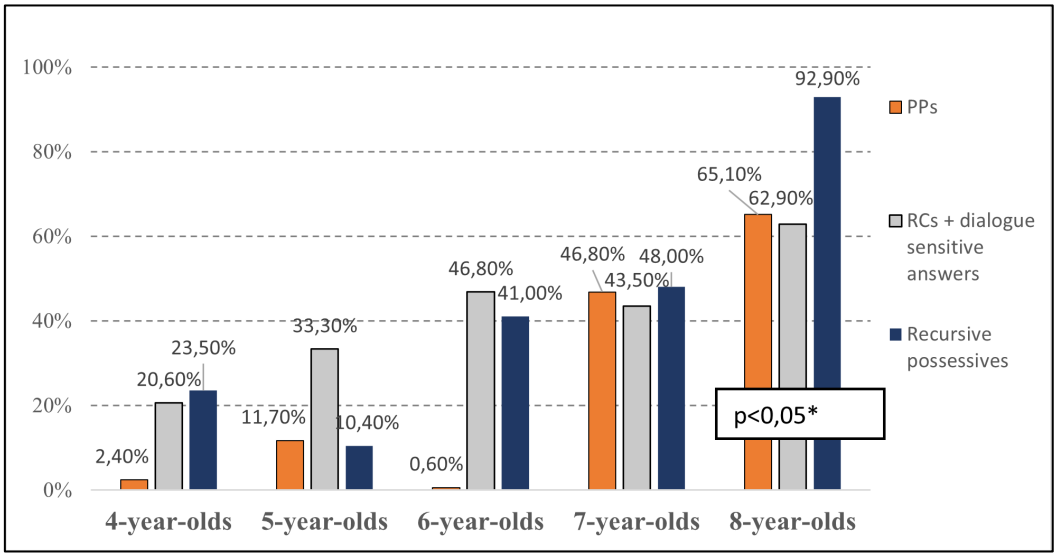

Chart 2. Correct answers of the 3 structures and dialogue sensitive answers

Research has shown that four-[4] and six-year-olds demonstrate a higher level of proficiency in answering questions related to relative clauses (RCs) and recursive possessives. In contrast, five-year-olds[5] demonstrate a higher level of proficiency in identifying RCs, surpassing their performance in recognising possessives or complex PPs. The seven-year-old group demonstrated equivalent proficiency in the production of all three structures. In contrast, the eight-year-olds[6] demonstrated a marked tendency to produce a greater number of recursive possessives in comparison to complex PPs or RCs.

The subsequent analysis of errors will provide insights into other mechanisms of production of the three structures.

	Complex PPs	RCs	Errors due to omission of certain components of the structure	other	Σ
4-year-olds	3 (2.4%)	-	**101 (82.1%)**[7]	19 (15.5%)	123
5-year-olds	23 (11.7%)	9 (4.6%)	**163 (83.2%)**[8]	1 (0.5%)	196
6-year-olds	1 (0.6%)[9]	13 (7.6%)	**152 (88.9%)**[10]	5 (2.9%)	171
7-year-olds	93 (46.8%)	1 (0.5%)	97 (48.7%)	8 (4%)	199
8-year-olds	**97 (65.1%)**[11]	1 (0.8%)	51 (34.1%)	-	149

Table 5. The production data for complex PPs

[4] χ^2 (2) = 16.879, p < 0.001***
[5] χ^2 (2) = 17.918, p< 0.001***
[6] χ^2 (2) = 7.5947, p < 0.05*
[7] χ^2 (2) = 109.59 p < 0.001***
[8] χ^2 (2) = 113.98 p < 0.001***
[9] Six-year-olds demonstrate a lower level of saturation compared to five-year-olds. This phenomenon can be attributed to the observation that, at the age of six, these children produce a greater number of relative clauses (which are otherwise the correct response to the situation) in comparison to PP. However, when the performance of five and six-year-olds is compared (correct answers are given by PP+RC; see Table 1), the difference in performance disappears (χ2 (1) = 2.678, p = 0.1017, n.s.).
[10] χ^2 (2) = 141.12 p < 0.001***
[11] χ^2 (1) = 9.6875 p < 0.01**

As illustrated in Table 5, children aged four to six frequently produce only some of the components of the structure, rather than the entire structure. Conversely, for seven-year-olds, there was no statistically significant difference between the production of individual components of the structure and the production of the whole structure. By the age of eight, a marked transition emerges, with children demonstrating a substantially higher level of production of the entire structure in comparison to its constituent parts. This progression in production is evident from the parts of the structure to the whole.

In the context of the production of relative clauses, three distinct categories of adequate responses are anticipated. (In the case of complex postpositional structures, children produced only complex PPs and some relative clauses). Participants produced some complex PPs, RCs, and there were also dialogue-sensitive responses regarding RCs. For instance:

(9a) E: *Hová ültetted a békát?*
Where did you put the frog?
P: *A malac elé.*
In front of the pig.
E: *Melyik malac elé?*
In front of which pig?
P: *Ami az elefánt alatt van.*
That is under the elephant.

In example (9a), children produce the target structure, but this requires an intervening "Which?" question. This possibility can be attributed to the dialogical nature of the experiment and is therefore considered a sufficient response. Conversely, for complex PPs (9b), a dialogue-sensitive response is not considered grammatical.

(9b) KV: *Hová ültetted a békát?*
Where did you put the frog?
R: *A malac elé.*
In front of the pig.
KV: *Melyik malac elé?*
In front of which pig?
R: **Az elefánt alatti.*
The elephant under.
/Az elefánt alatti malac elé.
In front of the pig under the elephant.

In the context of the RCs, responses that yield the relative pronouns are designated as dialogue-sensitive responses. Table 6 provides a comparison of the three types of possible responses and the errors due to omission of the components of the structure.

	Complex PPs	RCs	Dialogue-sensitive responses	Errors due to omission of components of the structure	Σ
4-year-olds	-	-	36 (20.6%)	**139 (79.4%)**[12]	175
5-year-olds	-	19 (13.8%)	27 (19.6%)	**92 (66.6%)**[13]	138
6-year-olds	15 (6.1%)	47 (19.3%)	67 (27.5%)	**115 (47.1%)**[14]	244

[12] $\chi^2(1) = 34.574$, $p < 0.001$***
[13] $\chi^2(2) = 50.305$, $p < 0.001$***
[14] $\chi^2(3) = 35.374$, $p < 0.001$***

7-year-olds	18 (11.7%)	55 (35.7%)	12 (7.8%)	**69 (44.8%)**[15]	154
8-year-olds	46 (28.9%)	**100 (62.9%)**[16]	-	13 (8.2%)	159

Table 6. RCs' production data

A comparison of the correct results and incorrect answers reveals that children under the age of eight primarily produce partial structures, with the capacity to generate RCs emerging from the age of eight onwards.

Table 7 presents a case where dialogue-sensitive responses and RCs are aggregated, as dialogue-sensitive responses containing the relative pronoun are also classified as correct responses.

	Complex Ps	RC+ dialogue-sensitive	Errors due to omission of certain components of the structure	Σ
4-year-olds	-	36 (20.6%)	**139 (79.4%)**[17]	175
5-year-olds	-	46 (33.3%)	**92 (66.7%)**[18]	138
6-year-olds	15 (6.1%)	114 (46.8%)	115 (47.1%)	244
7-year-olds	18 (11.7%)	67 (43.5%)	69 (44.8%)	154
8-year-olds	46 (28.9%)	**100 (62.9%)**[19]	13 (8.2%)	159

Table 7. RC production data with dialogue-sensitive responses

In this case, children aged four and five produced only parts of the target structure. No significant disparities were observed in the performance of six- and seven-year-olds when considering the production of parts of the structure, the production of dialogue-sensitive responses, and RCs. By the age of eight, the majority of children have attained the ability to produce the target structure in its entirety.

	Correct answers	Omission of certain components of the structure	Other	Σ
4-year-olds	42 (23.5%)	**125 (69.8%)**[20]	12 (6.7%)	179
5-year-olds	16 (10.4%)	**117 (76%)**[21]	21 (13.6%)	154
6-year-olds	**80 (41%)**[22]	**75 (38.5%)**	40 (20.5%)	195
7-year-olds	**72 (48%)**[23]	**50 (33.3%)**	28 (18.7%)	150
8-year-olds	**145 (92.9%)**[24]	2 (1.3%)	9 (5.8%)	156

Table 8. Production data for recursive possessives

[15] χ^2 (3) = 39.17, p < 0.001***
[16] χ^2 (2) = 45.766, p < 0.001***
[17] χ^2 (1) = 35.574, p < 0.001***
[18] χ^2 (1) = 11.156, p < 0.001***
[19] χ^2 (1) = 42.083, p < 0.001***
[20] χ^2 (2) = 64.075, p < 0.001***
[21] χ^2 (2) = 82.074, p < 0.001***
[22] χ^2 (2) = 7.505, p < 0.05* (The significance value is determined by comparing the correct and incorrect answers with the other answers. However, it should be noted that there is no discernible difference between the correct and incorrect answers.).
[23] χ^2 (2) = 12.877, p < 0.01** (The significance value is determined by comparing the correct and incorrect answers with the other answers. However, it should be noted that there is no discernible difference between the correct and incorrect answers.).
[24] χ^2 (2) = 159.97, p < 0.001***

The responses exhibited by the four- and five-year-old groups were characterised by the omission of specific components of the structure. In contrast, the six- and seven-year-old groups demonstrated comparable rates of production for both the complete structure and its constituent parts. However, it was observed that alternative forms of response were notably less prevalent compared to the two aforementioned categories. In contrast, eight-year-olds demonstrated a higher level of proficiency, producing a significantly higher number of recursive possessives in comparison to incomplete or alternative responses.

5.4.2. Results of the memory tests fitted to the three recursive structures

Firstly, the results of the digit span test are presented in Chart 3. Given that the order in which the experiments were presented in the article was PPs first, followed by RCs and then possessives, it was decided that this order would be maintained, although it should be noted that the number of syllables corresponding to possessives was the shortest in the sentence repetition and digit span tests (and it was placed last in diagram 3), reflecting the PP, RC, possessive order. This order has thus been adhered to in discussing the results of the memory tests.

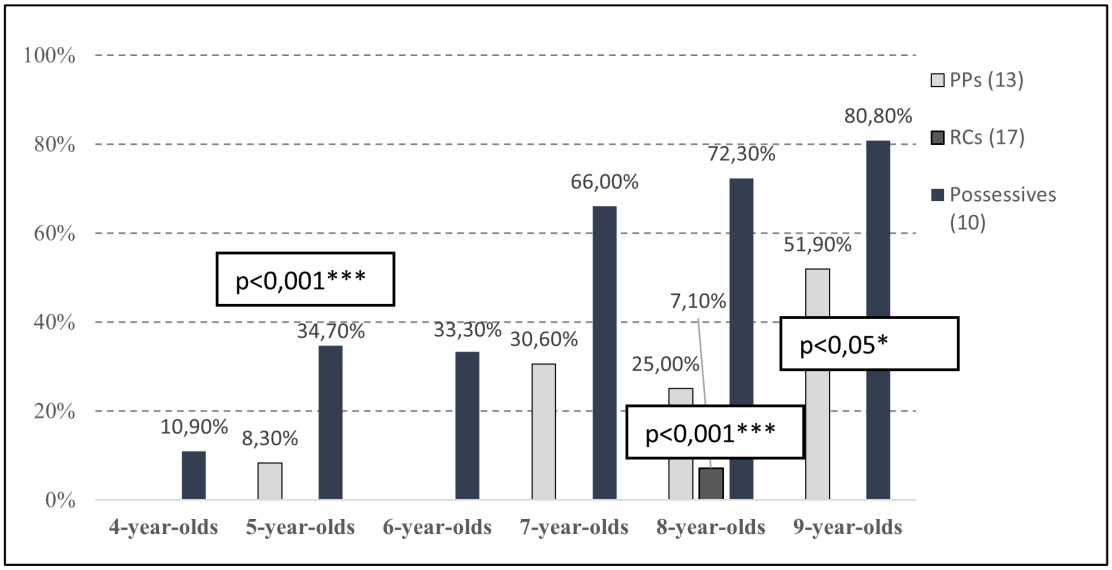

Chart 3. Digit span test regarding the 3 structures

As illustrated in Chart 3, four-year-olds and six-year-olds demonstrated an ability to repeat 10-syllable number sequences. Five-year-olds[25], seven-year-olds[26], eight-year-olds[27] and nine-year-olds[28] demonstrated a higher level of success in repeating 10-syllable number sequences than longer ones.

Notably, only eight-year-olds demonstrated proficiency in repeating 17-syllable number sequences, albeit at a comparatively low rate. For 13-syllable number sequences, older children demonstrating higher rates of repetition. This finding indicates a statistically significant difference between age groups[29]. In the case of the 10-syllable number sequences, a discernible distinction emerges in the performance of four- and five- and six-year-olds, and between five- and six-year-olds and eight- and nine-year-olds. The success rate of repeating the number sequences increases with age, thereby reflecting the preliminary hypotheses.

[25] $\chi^2(1) = 16.208.\ p < 0.001$***
[26] $\chi^2(1) = 12.973,\ p < 0.001$***
[27] $\chi^2(2) = 65.218,\ p < 0.001$***
[28] $\chi^2(1) = 5.9864,\ p < 0.05$*
[29] $\chi^2(3) = 33.556,\ p < 0.001$***

The subsequent aspect to be addressed is a summary of the data from the sentence repetition task, as illustrated in Chart 4.

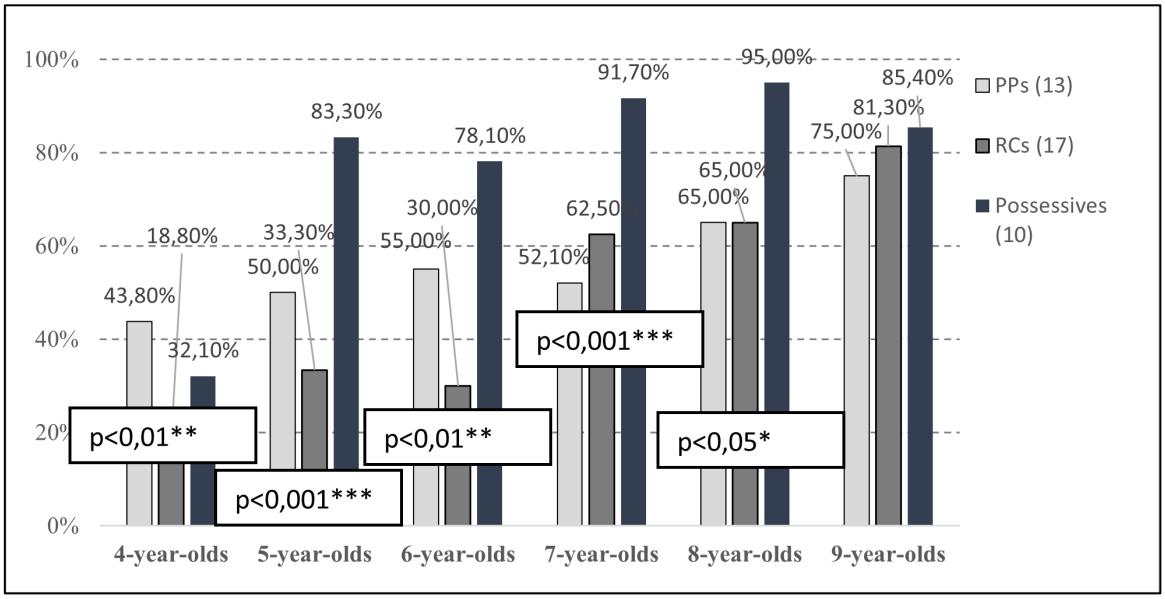

Chart 4. Sentence repetition task regarding the 3 structures

Four-year-olds[30] demonstrated a higher level of success in reproducing sentences comprising 10 and 13 syllables. In contrast, five-[31] and eight-year-olds[32] demonstrated a greater ease in reproducing 10-syllable sentences as compared to 13- and 17-syllable sentences. For six-year-olds[33], a clear distinction emerged in their ability to repeat all three syllable structures: The most successful were found to be sentences of 10, then 13 and finally 17 syllables. In contrast, seven-year-olds[34] demonstrated an equal aptitude in repeating 13- and 17-syllable sentences, yet found 10-syllable sentences to be the most manageable. In the ninth year, no discernible difference was observed between the three syllable structures.

However, a notable distinction emerged in the analysis of the 13-syllable sentence repetition task, where the success of four- and nine-year-olds[35] in repeating sentences was observed. For the 17-syllable sentences, the variation in performance is attributable to the difference between four-, five-, and six-year-olds, on the one hand, and seven-, eight-, and nine-year-olds, on the other. In the case of 10-syllable sentence repetition, the observed difference can be attributed to the performance of four-year-olds[36] and all other age groups.

In Chart 5, a comparison is made between sentences with complex PPs, which, despite their 13-syllable length, are not structurally complex. The chart illustrates the successful repetition rates of these two structures.

[30] $\chi^2(2) = 9.9132$, $p < 0.01$**
[31] $\chi^2(2) = 23.336$, $p < 0.001$***
[32] $\chi^2(2) = 8$, $p < 0.05$*
[33] $\chi^2(2) = 21.289$, $p < 0.01$**
[34] $\chi^2(2) = 12.259$, $p < 0.01$**
[35] $\chi^2(5) = 11.248$, $p < 0.05$*
[36] $\chi^2(5) = 34.348$, $p < 0.001$***

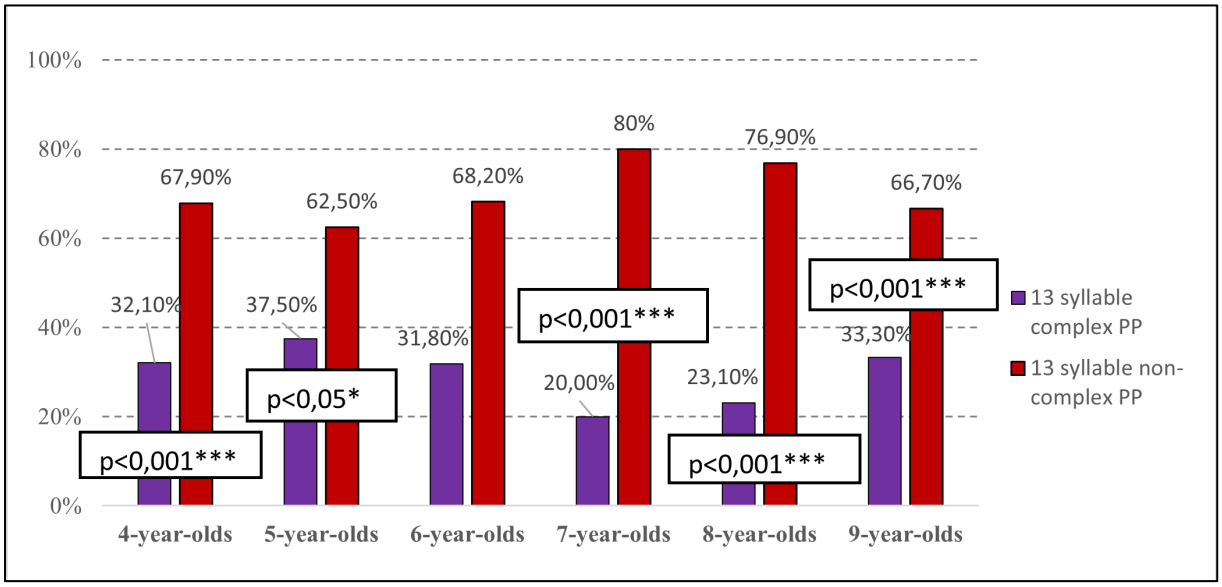

Chart 5. Sentence repetition: PPs

In addition, four-[37], five-[38], six-[39], seven-[40], eight-[41] and nine-year-old children[42] demonstrated a higher level of success in repeating 13-syllable, structurally non-complex PPs when compared to complex PPs.

In Chart 6, a comparison was made between the success rate of repeating simple sentences of 17 syllables and the success rate of repeating relative clauses of 17 syllables by age group.

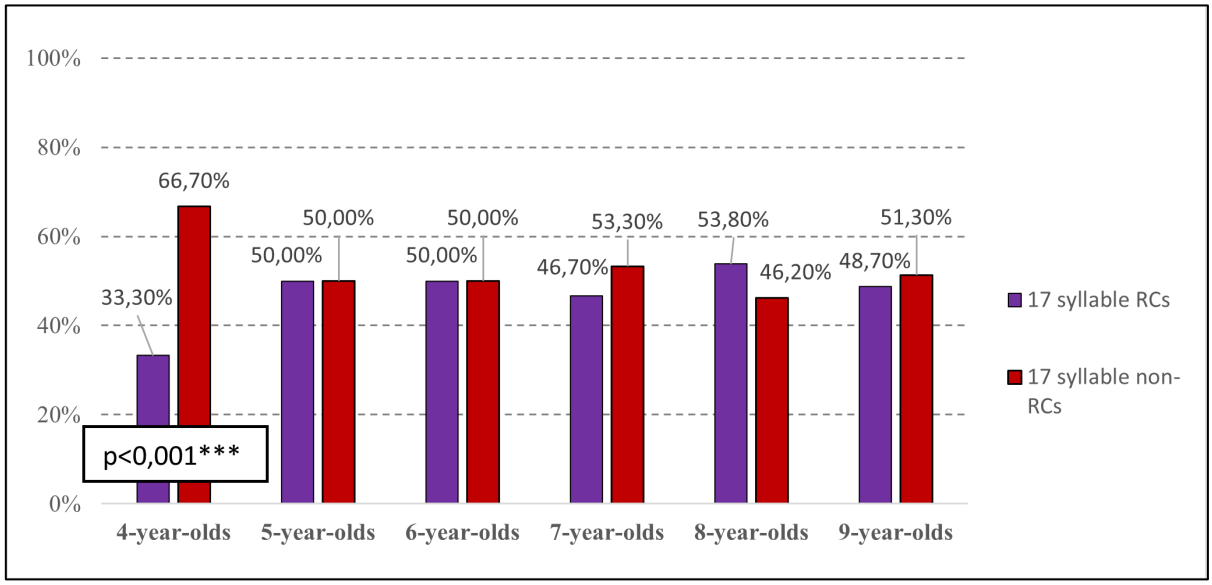

Chart 6. Sentence repetition: RCs

[37] $\chi^2(1) = 12.816$, $p < 0.001$***
[38] $\chi^2(1) = 6.25$, $p < 0.05$*
[39] $\chi^2(1) = 13.25$, $p < 0.001$***
[40] $\chi^2(1) = 36$. $p < 0.001$***
[41] $\chi^2(1) = 28.944$, $p < 0.001$***
[42] $\chi^2(1) = 11.156$, $p < 0.001$***

A statistically significant difference in the success rate of repeating 17-syllable RCs and 17-syllable non-RCs emerges only at age four.[43] Four-year-olds demonstrate a tendency to avoid embedding and exhibit higher levels of success in repeating non-RCs. In contrast, the success rate of repeating sentences of the two types is more evenly matched among the other age groups.

Chart 7 provides a visual representation of the success rate of possessive repetition.

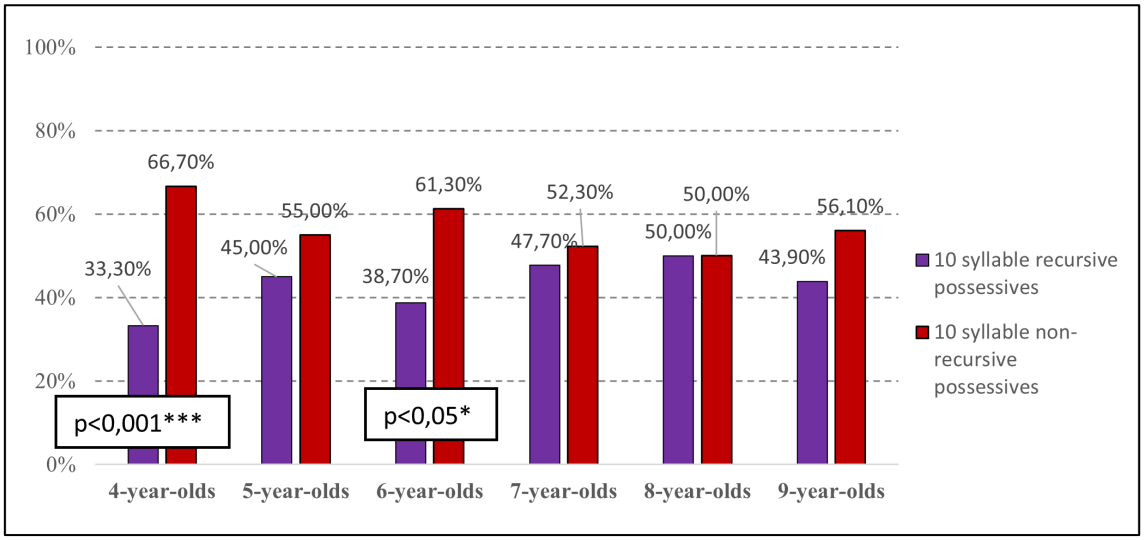

Chart 7. Sentence repetition: Recursive Possessives

A discrepancy has been observed in the repetition of recursive possessives and simple possessives at age four[44] and six[45]. At these ages, the repetition of simple possessives was found to be more straightforward than that of recursive possessives.

The data presented in Chart 8 offers a comprehensive overview of the success rate of recursive-only sentence repetition across the three constructions. By structure, it demonstrates the level of success achieved by the different age groups in repeating all recursive sentences.

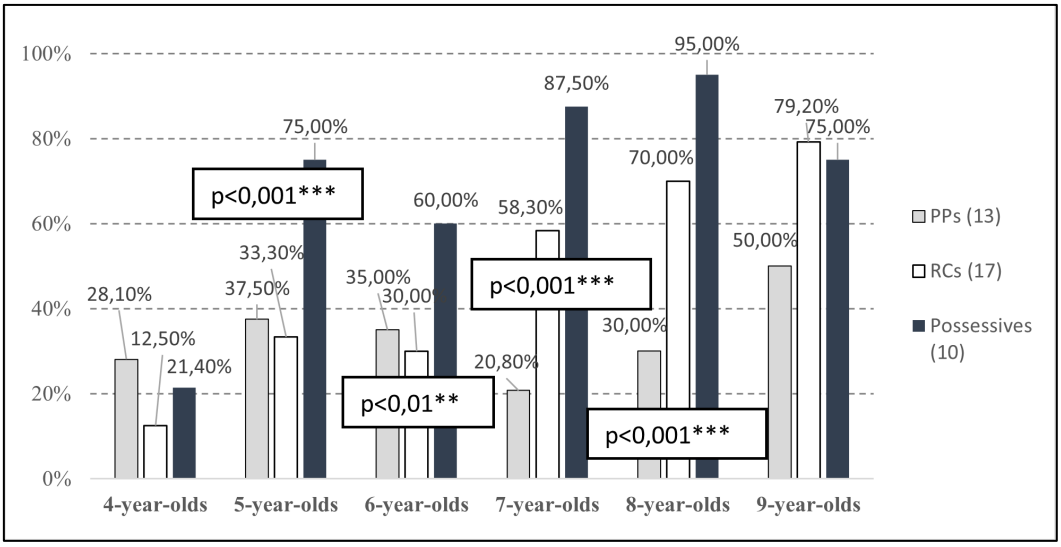

Chart 8. Sentence repetition regarding the 3 structures (only recursive answers)

[43] χ^2 (1) = 11.156, p < 0.001***
[44] χ^2 (1) = 11.156, p < 0.001***
[45] χ^2 (1) = 5.1076, p < 0.05*

The data demonstrate that there is no significant difference in the rate of repetition of the three recursive structures at age four only, even when differences between postpositional structures (PPs) and relative clauses (RCs) are taken into account[46]. However, a marked disparity was observed in the performance of five-[47], six-[48] and seven-year-olds[49] in the production of recursive possessives, as compared to their proficiency in PPs or RCs.

In the group of children aged eight, the production of recursive possessives was the easiest, with significant differences between the success rates of possessives and RCs, and RCs and PPs. The production of PPs was found to be the most challenging for children. At the age of nine, the production of recursive possessives and RCs was the easiest, while that of PPs was the most difficult.

The errors made by the four-year-olds were primarily due to their inability to recall the entire target sentence, often resulting in the incorrect use of postpositions. In the case of the five-year-olds, the most common errors were the omission of the middle component and the misuse of postpositions. Six-year-olds' errors were typically attributable to either a failure to repeat the entire target sentence or an inability to recall the initial segment of the sentence. Errors made by seven- and nine-year-olds were predominantly attributed to misplacement of postpositions, while those observed in eight-year-olds were characterised by the omission of the middle postpositions and NP, in addition to misplacement of postpositions (e.g. *in front of the cat* instead of *in front of the mouse*).

Four-year-olds typically demonstrated an inability to repeat the RCs, while five-, six- and eight-year-olds were able to summarise the meaning of the target sentence in their own words. Errors made by seven-year-olds were typically characterised by mispronunciation, while those made by nine-year-olds were mainly characterised by the reversal of lexical items.

At the age of four, children primarily produced constructions that bore similar meanings to recursive possessives, or else they omitted the second possessive. The number of errors observed in five-, seven- and eight-year-olds was comparatively low. Six-year-olds demonstrated structures with a richer morphology than the target sentence, producing a double -nAk structure and omitting the possessive. Errors made by nine-year-olds were typically attributable to lexical item reversals.

5.4.3. Comparing the results of the memory test with the results of recursive structure acquisition

The following section presents the findings of the sentence repetition task for recursive possessives (10 syllables), complex PPs (13 syllables), and relative clauses (17 syllables). The comparison is initiated with complex PPs, the data for which are presented in Table 9.

	Production	Digit span tests	Sentence repetition
4-year-olds	2.4%	-	**28.1%**[50]
5-year-olds	11.7%	8.3%	**37.5%**[51]
6-year-olds	0.6%	-	**35%**[52]
7-year-olds	**46.8%**[53]	30.6%	20.8%
8-year-olds	**65.1%**[54]	25%	30%

Table 9. Complex PPs

[46] $\chi^2(1) = 0.9301$, $p = 0.3348$, n.s.
[47] $\chi^2(2) = 21.693$, $p < 0.001$***
[48] $\chi^2(2) = 12.4$, $p < 0.01$**
[49] $\chi^2(2) = 40.263$, $p < 0.001$***
[50] $\chi^2(1) = 21.655$, $p < 0.001$***
[51] $\chi^2(2) = 21.606$, $p < 0.001$***
[52] $\chi^2(1) = 33.24$, $p < 0.001$***
[53] $\chi^2(2) = 10.534$, $p < 0.01$**
[54] $\chi^2(2) = 23.855$, $p < 0.001$***

Until the age of six, sentence repetition was easier than production tasks and digit span tests. However, by the age of seven, the sequence of tasks was reversed, with production of PPs taking precedence over the digit span test and sentence repetition. In the eighth year, the production task was found to be the least demanding, followed by the digit span test and the sentence repetition task. This finding suggests that, at this age, working memory does not have a significant effect on understanding recursive structures, as the production tasks were found to be easier than the memory tasks.

The subsequent analysis will focus on a comparison of data for the relative clauses. Table 10 shows the production of RCs.

	Production	Digit span tests	Sentence repetition
4-year-olds	-	-	**12.5%**
5-year-olds	13.8%	-	**33.3%**[55]
6-year-olds	19.3%	-	30%[56]
7-year-olds	35.7%	-	**58.3%**[57]
8-year-olds	**62.9%**	7.1%	**70%**[58]

Table 10. RCs

The data presented in Table 10 demonstrate the repetition of sentences comprising 17 syllables, corresponding to the relative clauses. It is evident that at ages five, six and seven, sentence repetition is the most straightforward task, followed by the production task. However, at the age of eight, no discernible difference was observed in the proportion of production and sentence repetition responses. At this age, children demonstrated the capacity to repeat 17-syllable sentences, albeit at a relatively low rate.

The sentence repetition column of Table 11 exclusively displays the repetition success of recursive possessives, excluding 10-syllable but not recursive possessives.

	Production	Digit span test	Sentence repetition
4-year-olds	23.5%[59]	10.9%	21.4%
5-year-olds	10.4%	34.7%	**75%**[60]
6-year-olds	41%	33.3%	**60%**[61]
7-year-olds	48%	66%	**87.5%**[62]
8-year-olds	92.9%	72.3%	95%[63]

Table 11. Recursive possessives

[55] $\chi^2(1) = 8.0732$, $p < 0.01$**
[56] $\chi^2(1) = 2.3223$, $p = 0.1275$, n.s.
[57] $\chi^2(1) = 5.4336$, $p < 0.05$*
[58] $\chi^2(2) = 50.86$, $p < 0.001$***
[59] $\chi^2(2) = 4.9$, $p = 0.08629$, n.s.
[60] $\chi^2(2) = 53.187$, $p < 0.001$***
[61] $\chi^2(2) = 8.4377$, $p < 0.05$*
[62] $\chi^2(2) = 11.645$, $p < 0.01$**
[63] $\chi^2(2) = 3.6282$, $p = 0.163$, n.s.

The four-year-olds demonstrated the greatest aptitude in the sentence repetition and production tasks; however, the digit span test presented the most substantial challenge for this age group. There was no discrepancy between the results of the digit span test and the sentence repetition test; however, children performed better on the production task than on the digit span test. In contrast, the production task emerged as the most challenging for five-year-olds, followed by the digit span test and then the sentence repetition test. Notably, at age five, the ratio of the production to the digit span task reversed compared to age four. In the six-year-old group, the digit span test and the production task were the most challenging, followed by the sentence repetition task. For the seven-year-olds, a significant difference was observed between the scores on the production and sentence repetition tests and the production and digit span tests. The sentence repetition task was found to be the easiest. In the eight-year-old group, no significant differences were observed in performance across the three test types. The subsequent section will provide a synopsis of the observed variations.

5.5. Discussion

The findings of this study unequivocally demonstrate a robust correlation between the development of working memory and the acquisition of recursive language structures. The experiments demonstrated that the capacity to produce recursive structures exhibited an increase with the age of the children. Notably, the 6–8 age group demonstrated a marked superiority in the production of recursive possessives, relative clauses and complex postpositional structures when compared to younger age groups.

These findings align with the conclusions of previous research by Racsmány et al. (2005), which substantiates the notion of a robust correlation between verbal working memory capacity and language development. The present study observed that children with higher age (and presumably working memory capacity) were able to use more complex recursive structures, which are essential for enriching linguistic expressions.

A further intriguing discovery from the research was that, in addition to the length of the structures, the complexity of the structures was also a determining factor in the performance of children. The findings indicate that subordinate clauses, which demand more intricate semantic relationships, pose a significantly greater challenge for children than relatively longer yet structurally less complex sentences. The structure *A tehenet az elefánt fölé tesszük, ami a cica előtt van/We put the cow above the elephant that is in front of the cat* provides a clear separation between the elements describing the cow, the elephant and the cat, facilitating processing. Conversely, the more intricate structure of the sentence *A tehenet a cica előtti elefánt fölé tesszük/We put the cow above the elephant in front of the cat* and the cognitive load associated with interpreting the phrase *elephant in front of the cat* may impede children's ability to comprehend the task.

The processing of language by children necessitates the consideration of both quantitative and qualitative aspects. The extent to which children encounter challenges, and the nature of the structures with which they are confronted, can offer valuable insights into the development of their language skills. The varying intricacy of linguistic structures and the semantic relationships inherent within them have been demonstrated to exert an influence on children's production performance.

The findings of this research indicate that the acquisition of recursive possessives tends to occur earlier than that of the relative clauses and complex postpositional structures. These findings suggest that the acquisition of different linguistic structures is associated with different developmental stages. The use of recursive possessives in simpler contexts has been shown to involve less cognitive load for children, while more complex structures, such as complex PPs, require higher levels of working memory activity.

The present study is subject to several limitations. Firstly, the number of participants was relatively small. Secondly, the study samples were drawn from different socio-cultural backgrounds, which may have an impact on the generalisability of the results. It is recommended that

future research employ a larger sample size and samples with greater homogeneity, in addition to including an adult control group.

6. Conclusion

The present study was conducted with the objective of investigating the relationship between the development of working memory and the acquisition of recursive language structures. The results obtained demonstrated a clear correlation between the language development of children and their working memory capacity, which facilitates the production of more complex recursive structures. Notably, for children aged 6–8 years, the acquisition of recursive possessives tended to occur earlier than that of the relative clauses and complex postpositional structures. This finding suggests that the acquisition of linguistic structures is associated with different developmental stages.

The findings further demonstrate that children's performance is influenced not only by the length of the sentences but also by the complexity of the structures. Relative clauses that demand more sophisticated semantic relations exhibited superior performance in memory tests in comparison to complex PPs, thus offering a novel perspective on the study of language processing.

The present study contributes to a more profound understanding of the relationship between working memory and language development, and it provides new insights into the process of acquiring recursive language structures. These findings offer potential avenues for enhancing pedagogical practices and language teaching programmes, with the aim of supporting children's development of language skills.

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