
How do Hungarian adults read aloud?

Judit Bóna

Angéla Imre

Eötvös Loránd University, Hungary

Introduction

In everyday life it often happens that we have to read something out aloud. The success with which we accomplish this task shows how fluently we can read, how proficient readers we are, whether we can interpret a written text and to what extent we are able to transpose it into the spoken medium.

Reading proficiency is based partly on the particular reader's general language comprehension skills and partly on her expertise in decoding a written text (cf. Tóth 2002). Understanding a written text presupposes speaking the relevant language and being familiar with its formal structure. Phonological awareness means the ability of accurately perceiving the speech flow and of discriminating the phonological segments of the given language in it. Knowledge of the relevant syntactic rules makes it possible that words of the various grammatical classes be used in the appropriate order within the clause, whereas their meaning is taken care of by semantic awareness. These three levels of linguistic skills are complemented by background knowledge, the mass of information and experience accumulated in the interactions that one has carried out in one's life. Decoding requires familiarity with the code (letter-to-phoneme correspondences) and an appropriate amount of lexical knowledge. In the case of letter-based writing systems, reading also requires recognition of the alphabetic principle (cf. Perfetti 1999). Psycholinguistic research has confirmed that there are important differences between beginners' and experienced readers' decoding strategies (Ehri & Wilce 1987, Samuels 1994). In the case of the latter, deliberate phonological decoding is preceded by the use of visual and phonological stimuli, and the process also crucially involves automatisms. Furthermore, the two groups also differ in their eye movements (Nodine & Simmons 1974), in their performance in cloze tests (in which they have to supply certain words that have been removed from a text, Mackworth 1977), as well as in the way they utilize graphic information and context (Tóth 2002).. In addition to cognitive factors, the process of reading also crucially involves memory and attention. It is important to note that linguistic comprehension and decoding mutually support one another and neither is sufficient, in itself, for the mechanism of reading to work properly. Consequently, we can state that people who have difficulty in

understanding what they read also necessarily have problems with linguistic comprehension, or decoding, or both.

The comprehension of a text and the quality of reading are influenced by a number of factors. The aim of the actual reading session is one of them. Other relevant factors include the amount of new vs. known information that the text contains (Shebilske & Fischer 1981), the extent to which the reader is able to cover larger chunks of text at a time, the level of conventional order in the text and contextual effects (Erich & Rayner 1981), and the typographical layout of the text to be read (Frase & Schwartz 1979). It is also far from being irrelevant whether the text is read silently or aloud. What is the difference between these two cases? In silent reading, it is primarily the areas of visual processing that are activated, whereas in oral reading, primary activation takes place in the areas of speech processing (Berninger 1996). It has been observed that reading without moving one's lips is an acquired habit; the natural behavior is for the lips to keep moving while the person is reading. Children first learn to read aloud in school, and the phase of silent reading only comes subsequently. Nevertheless, it can often be observed that even older speakers are unable to read aloud routinely and well. Green (1998) observed in children between 10 and 14 years of age that many of them feel uneasy when they have to take turns in reading something out aloud and understand the whole of the text poorly or less well, given that they tend to concentrate on the portions they have to read out themselves, in order to avoid making mistakes in them. Children who are poor readers in general find reading aloud to be an enormous challenge. The author tried to diminish the negative experience of reading by using the RRI (Rapid Retrieval of Information) technique and by having pupils acquire various reading and task solving strategies.

One of the earliest experiments concerning errors committed in reading aloud was conducted by Fairbanks (1937, cited by Tóth 2002: 49). In the research university students were divided into good and poor readers on the basis of their performance in comprehension tasks based on their silent reading. It turned out that, in reading aloud, poor readers committed almost three times as many errors as good readers did (the former committed 5.8 errors per 100 words on average whereas the latter committed 2.1), and the actual errors exhibited a characteristic pattern. In both groups, word replacement was the most frequently occurring error type, but while 51% of poor readers replaced the target word by a word that meant something quite different, none of the good readers did so. Self-correction, on the other hand, occurred with good readers more often than it did with poor readers. Other investigations reported in the literature study reading aloud either in terms of errors committed as a function of the use of contextual information (Biemiller 1970,

Weber 1970, Cohen 1974-1975) or in terms of self-corrections and reading strategies used for avoiding errors (Willows & Ryan 1981, Juel 1980).

Apparently, very few surveys of oral reading have been conducted so far with the participation of adult native speakers of Hungarian, and even those few studies primarily analyzed the success of reading aloud in students of teacher training colleges (cf. Adamikné Jászó 2000). In the present paper, we investigate how Hungarian natives of various ages and occupations can read out a simple text of popular science. Our hypothesis is that most subjects would commit, along with reading errors, also several uncertainty-based errors and interpretation errors. Furthermore, we hypothesize that the quality of reading aloud would depend on the subject's age and occupation/level of education.

Method, material, subjects

Our study is based on fifty samples of speech recording from the Hungarian Spoken Language Database (BEA, cf. <http://www.nytud.hu/dbases/bea/index.html>). The recordings selected come from 25 female and 25 male subjects; their ages range between 20 and 77 years (the youngest woman is 22, the oldest is 77 years old, the youngest man is 20, the oldest man is 71). In terms of their occupation, 25 subjects are teachers/faculty of arts graduates, and 25 subjects do something else for a living.

The subjects' task was to read out a text of popular science that they were allowed to privately read and understand beforehand. The reading sessions took place in a soundproof chamber and were recorded digitally.

In the recordings, we analyzed reading errors; speech rate and articulation rate; the location and length of pauses; stress and intonation; and we evaluated the "quality" of reading, that is, the extent to which the subject was able to read comprehensibly.

We processed a total of 108 minutes (6471123 ms) of recording. Acoustic analyses were performed using Praat 5.0 (Boersma & Weenink 1998); statistical analyses (Pearson's correlation) were performed by SPSS 13.0.

Results

In our subjective evaluation, a mere 42% of the subjects were able to read out the text "comprehendingly and comprehensibly". None of them produced error-free reading; there was a single person (a speech therapist by profession) who committed just a single error, and two subjects committed two each. In the speech production of the other readers, several reading errors, uncertainties, and/or interpretation errors were attested.

A total of 256 reading errors were found in the recording. The proportions of error types can be found in Figure 1.

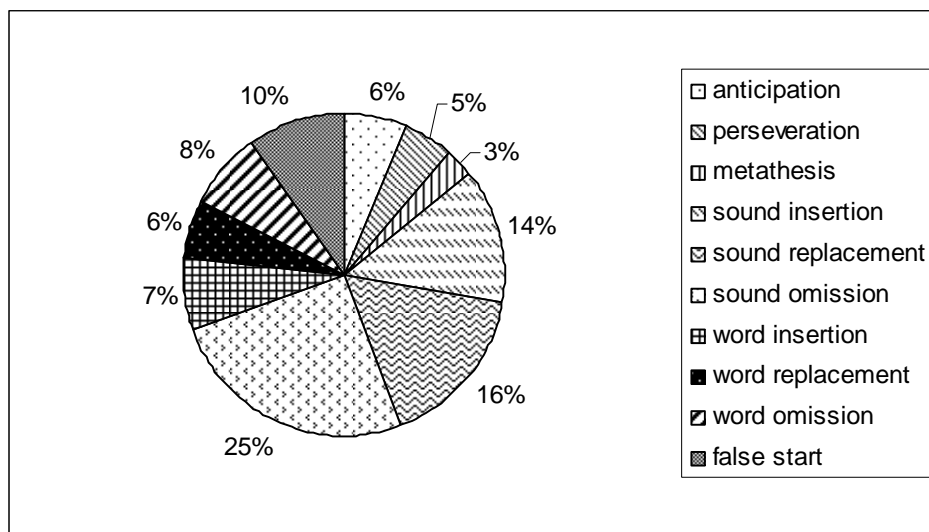


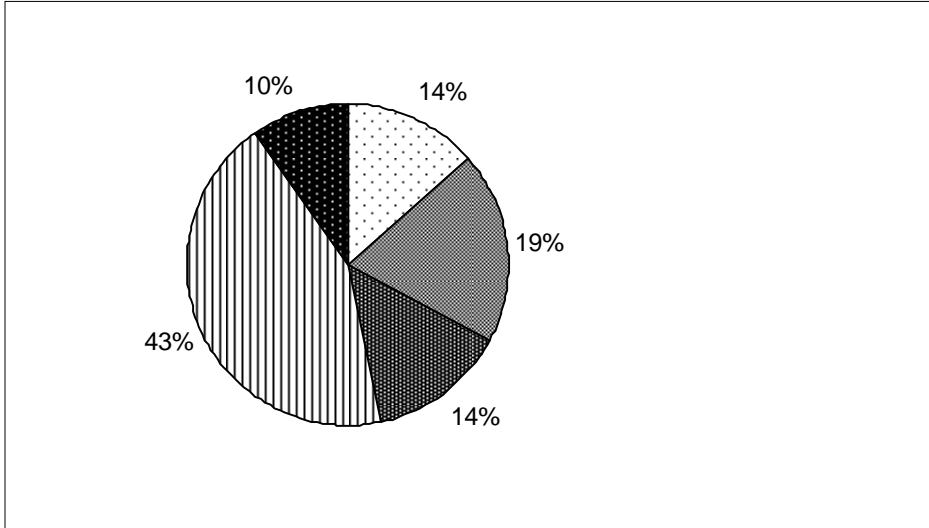
Figure 1
Proportions of various types of reading errors

The largest group of reading errors involved sound/syllable omissions. Of these, the most frequent cases were in which the reader skipped the plural marker (e.g., *piacon* ‘at (the) market’ for *piacokon* ‘at (the) markets’); or the derivational suffix *-hat/-het* ‘may’ was left out (e.g., *károsítja* ‘harms’ for *károsíthatja* ‘may harm’). One plural item was misread by 60% of the subjects (30 persons): they pronounced *mutathatók* ‘ones that can be shown’ for *mutathatók* (a morphophonological variant of the former, meaning the same thing). The reason must have been the frequency of the misread item and the fact that both forms are grammatical in Hungarian.

We found relatively many sound replacements in the recording. In these, the reader replaced a single sound of the target word by some other sound. In most cases, the subject produced a word of either identical or very closely related meaning (for instance, *nem* ‘not’ for *sem* ‘nor’). We have also attested a number of sound replacements in foreignisms like *primőr* ‘primeur, hasting’ or *importált* ‘imported’.

In general, the most numerous errors were found for *mutathatók* (see above) and *megbetegedéseket* ‘morbidity cases-accusative’.. Only 19.9% of the errors (51 items) were subsequently corrected by the speakers.

The subjects produced a total of 73 cases of uncertainty-based disfluency. Their distribution can be seen in Figure 2. The most frequently occurring errors of this type (43% of all cases) were restarts. These occurred primarily in pronouncing lengthier items (e.g., *muta mutatható* □ *mutathatók ki, ahol i ahol immunrendszeri* ‘...can be shown, where immunity...’).



and speech rate ($r = -0,524$; $p \leq 0,001$), that is, older speakers' tempo was significantly slower than that of younger speakers (this squares well with literature data saying that speech tempo becomes slower in old age). Similar results were found for articulation rate ($r = -0,596$; $p \leq 0,001$). However, the single speaker exhibiting the slowest speech rate and articulation rate was not one of the oldest subjects; she was 49 years old.

On average, subjects paused in 15% of their speech time (SD: 8–24%). The number of pauses was between 23 and 75. The highest number of pauses was produced by the speaker who also committed the largest number of errors. The shortest pause lasted 34 ms, the longest lasted 4220 ms. Given that the lung's vital capacity lessens with the progress of age, we thought that the oldest subjects would produce the most and the longest pauses. However, the statistical data did not confirm this hypothesis (neither age and the number of pauses, nor age and the proportion of pauses were significantly correlated). The highest number of pauses (both in absolute numbers and proportionately) was produced by a 27-year-old man whose lack of experience in reading was also signaled by the large number of errors he committed.

The fluency parameter shows how fluent a sample of speech is, that is, how many words are pronounced between two pauses (on average). The higher this number, the more fluent the speech sample is. The fluency parameter of the most fluent sample was 10.3; that of the least fluent speech production was 3.3.

Incorrect pausing (where the speaker pauses at a point where there is no grammatical reason for it and hence the aural comprehension of the text is made more difficult) is taken to be a segmentation error based on failure to comprehend the text, on reading uncertainty, or on being inexperienced in reading aloud. We found a total of 94 segmentation errors. In 43% of these, there was a pause between a possessive noun or an adjective and the noun it modified (e.g., *a környező területek élővilágát* 'the plants and animals of the surrounding area', *daganatos megbetegedéseket okozhatnak* 'they may cause tumorous illnesses'); in 11%, between a definite article and a noun (e.g., *a szezonális termékekétől* 'from that of the seasonal products'); in 6%, within a word (e.g., *kártevők kártevők re* 'for pests pests'); and in 40% of all cases the segmentation error occurred at the clausal level (for instance, there was a pause after a conjunction or before the particle *is* 'too', etc.).

We have found a total of 16 stressing errors. 56% of those (9 errors) occurred in adjective-noun constructions; the speakers stressed the noun rather than the adjective (e.g., **növényvédő SZErek* for *NÖvényvédő szerek* 'pesticide sprays', **fejes SALáta* for *FEjes saláta* 'lettuce'). Stressing errors also occurred in compounds

(e.g., **növényvédőszer-TAR*talmát for *NÖvényvédőszer-tartal*mát ‘its pesticide content-acc’, **vitaminFOR*rás for *Vitaminfor*rás ‘vitamin source’), and even in simple (case-marked) words (e.g., **boltokBAN* for *BOL*tokban ‘in shops’).

In terms of intonation, we classified the samples into four groups of correctly intoned, incorrectly intoned, over-intoned (singsong), and monotonous speech, respectively. The incorrectly intoned samples were neither monotonous nor over-intoned but included cases in which the speaker used an intonation pattern that was not appropriate to the content. In terms of our subjective evaluation, 38% of the speakers used correct intonation throughout, 20% committed some intonation errors, 36% read monotonously, and 6% produced singsong intonation.

Segmentation, stressing, and intonation errors reveal inaccurate comprehension and/or lack of sufficient experience in reading aloud. We have tried to find correlations between occupation (including expected level of reading proficiency) and prosodic features of the samples. The results suggest that roughly three times as many of the teachers or faculty of arts graduates were able to read a text comprehendingly and comprehensibly than of people with other jobs. On the other hand, a high proportion (ca. 32%) of even the former group also failed to solve the task to the expected extent.

Summary and conclusions

In the present study, we tried to find out how well Hungarian adults can read aloud. The results show that many adults have problems already in decoding the text they have to read. Decoding difficulties (reading errors) occur significantly less often if the adult is an experienced speaker/reader; however, such experience does not necessarily entail that the speaker is capable of “comprehending and comprehensible” reading. In many cases, the quality of reading suggests boredom, or it shows that the speaker wants to squeeze through the reading task as quickly as possible.

We had expected that age and occupation (experience) would also influence the quality of reading. As the data reveal, with respect to age, it is only in temporal characteristics that differences can be found. Occupation influenced speech production in that a higher proportion of teachers etc. were able to read correctly. On the other hand, several of them committed quite a few errors and/or produced a poorly interpreted spoken text.

In conclusion, we can say that many Hungarian adults are at the level of less-than-ten-year-olds when it comes to reading out a text aloud.

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