

FACTORS AFFECTING READING COMPREHENSION

Szilvia Varga Tánczikné^{1*}

¹Department of Foreign Languages and Further Education, Pedagogical Faculty, John von Neumann University, Hungary

Keywords:

reading comprehension
phonemic awareness,
morphemic awareness
metalinguistic awareness
vocabulary

Article history:

Beérkezett: 18 September 2017
Átdolgozva: 3 October 2017
Elfogadva: 17 October 2017

Abstract

This article explores factors affecting reading comprehension. It discusses different concepts on reading comprehension and describes some components of reading abilities, which are important to decode the written text. Large amount of research was devoted to analyze linguistic, cognitive and other factors influencing reading abilities. This study highlights the role of vocabulary, phonological, morphological awareness and metalinguistic knowledge in reading comprehension.

1 Introduction

Reading comprehension is getting increasing attention because modern information-based society requires excellent reading comprehension skills. Learning highly depends on the comprehension of information from text sources [1]. Thus reading is really fundamental in every academic discipline. Reading research aims to tap into the processes of comprehension in order to find out how people read. Better understanding of reading skills can help develop more effective teaching programs. This paper discusses factors influencing reading comprehension. Many of the skills and strategies required for reading comprehension already appear in beginning readers in their ability to comprehend the language. As a first step pupils must learn how to decode individual words and sentences (including syntax). The most recent findings in neuroscience show children need a systematic phonological and morphological training to become a good reader. Reading abilities develop over time, readers gradually realize that meaning is often more complex than a single word, a sentence, or even a paragraph, in the end they learn how to read between the lines, use their associations. They must use their background knowledge to make the inferences, which are necessary to reveal these deeper meanings [2].

2 Definition of reading comprehension and areas of reading research

“To learn to read is to light a fire; every syllable that is spelled out is a spark. —Victor Hugo”
Reading appeared along with the birth of human culture. The necessity to communicate more complex information created the need for creating the language. Later, people invented writing, which could turn human speech into visual symbols. Reading is the way we can decode the symbols. Neurological studies suggest that human brain has to change to be able to read and write. Recent brain imaging techniques show that the brain can rearrange itself to be able to read in different languages. Existing circuits of neurons originally designed for vision, language, and cognition learned to forge a whole new reading circuit. The “neuronal recycling” hypothesis was created by Dehaene [3] who states each cultural acquisition must find its ecological niche in the human brain, a circuit whose initial role is close enough and whose flexibility is sufficient can be reconverted to this new role. According to Dehaene children’s brain is not prepared to read and

* Corresponding author. Tel.:
E-mail address: varga.szilvia@gamf.uni-neumann.hu

write. Therefore grapheme and phoneme correspondence should be taught systematically. Reading is a relatively new acquisition, we transform some parts of our visual structure of our brain in order to turn them into specialised interface between vision and language, large regions of the left hemisphere are identically activated [4].

The definition of reading has changed a lot in the last two decades. Different approaches defined it in a different way. "Bottom-up" models suggest that comprehension is decoding the information from the printed text. This view concentrates on how words are recognized, how long they are kept in working memory. Working memory is often referred to as short time memory [5]. The bottom-up models suggest that reading begins with a reader processing the visual information exhibited by the text. However, researchers propagating the top-down model argue with this view suggesting that the reader plays the most important role in comprehension, who constantly makes inferences during reading, and reading is a psycholinguistic guessing game [6]. Unfortunately, reading instruction embraced this idea, and the basal readers were changed to follow the whole word concept [7]. As a result, children learned how to read more slowly than with the phonics concept, which followed the bottom up model [8]. Recently, one of the most quoted definitions is the one which was created by the RAND [9]. They point out that comprehension is "the process of simultaneously constructing and extracting meaning through interaction and engagement with print." It includes three elements: the reader, the text and the activity or purpose of reading. It emphasizes both the bottom-up and top-down elements, however, calls the attention to the importance of phonics [10].

3 Linguistic and cognitive factors of reading comprehension

Before learning to read children have to learn how to speak, they have to acquire their own mother tongue. There is a strong link between language acquisition and reading skills. There are two main approaches as to how children acquire or learn language. Skinner declares that all languages must be learned by the child even the mother tongue. This approach in psychology known as behaviorism, which points out that language is a behavior formed by conditioned response, therefore it can be learned [11]. The other famous view is the Universal Grammar hypothesis which supposes that although human languages differ on the surface they share some basic similarities, and that there are innate principles unique to language; in other words, there is only one human language under the surface. [12]. Chomsky suggests that humans possess a special, innate ability for acquiring languages and that complex syntactic features are "built" in the brain. According to Chomsky, children acquire a language owing to some innate mechanism, which help humans develop language ability [13]. The "innate" view cannot be scientifically falsified; in other words it can't be tested. There are certain similarities among certain languages. However, in case of linguistically distant languages, the UG does not seem to be useful for example, Hungarian learners of English experience more differences than similarities between the two languages. There are a number of features, which influence how easy or difficult is for children to learn to read.

Reading abilities have different components. According to the Reading Panel [14] these components are the following: phonemic awareness, phonics, fluency and vocabulary. Phonemic awareness is the knowledge that words are made up of a combination of individual sounds. It also includes the ability to hold on to those sounds, blend them successfully into words and take them apart again. Phonics is the relationship between a specific letter and its sound, only as it relates to the written word. Phonics has a special significance in opaque orthographies like English where children have to learn the spelling of different words.

Reading development is influenced by the orthography of the language. Orthographic depth hypothesis can be applied to both teaching reading for L1 and L2 readers. It emphasizes the importance of connections between orthographies of languages and reading process [15]. Katz, & Frost suggest that in shallow orthographies the words can be identified more easily. Deep orthographies encourage a reader to process printed words by referring to their morphology. For languages with relatively deep orthographies the new readers have difficulty learning to decode the words. As a result children learn to read more slowly [16]. Orthographic depth indicates the degree to which a written language derivates from grapheme-phoneme correspondence. It depends on

how easy or difficult it is to predict the pronunciation of a word based on its spelling. In shallow orthographies, the spelling-sound correspondence is direct; from the rules of pronunciation one is able to pronounce the word correctly. Shallow (transparent) orthographies, also called phonemic orthographies, have one-to-one relationship between its graphemes and phonemes, and the spelling of words is very consistent, for example, Serbo-Croatian and Italian. In deep (opaque) orthographies, the relationship is less direct, and the reader must learn the arbitrary or unusual pronunciations of irregular words, for example, English and Hebrew [17].

Reading is the process of understanding speech written down. Ziegler and Goswami [18] point out that reading is the process of understanding speech written down. The goal is to gain access to meaning. Children must learn the code used by their culture for representing speech as a series of visual symbols. Children have to match distinctive visual symbols to units of sound (phonology). The expression phonics refers to the connection between sounds and letter symbols. It is also the combination of these sound-symbol connections to create words. In most languages, the relationship between symbol and sound is systematic, whereas the relationship between symbol and meaning is arbitrary.

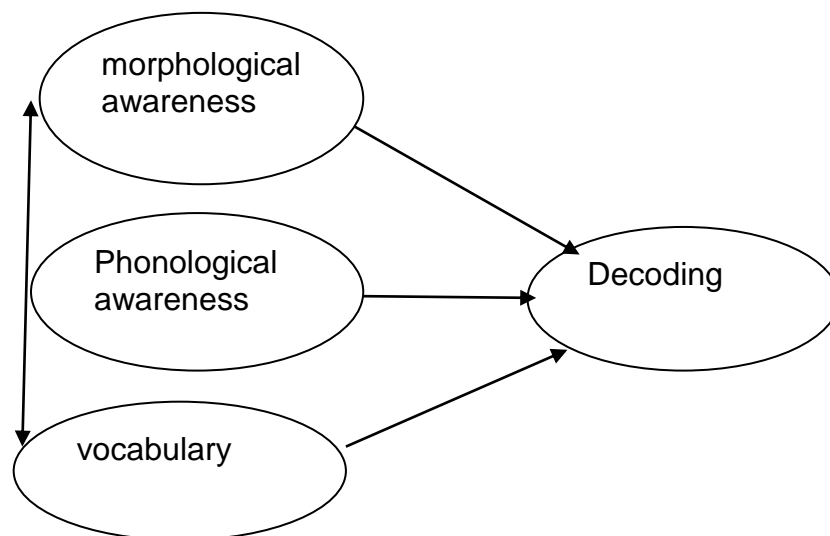
From linguistic point of view comprehension consists of sublexical and lexical elements which include phonological awareness. It also includes morphological awareness, for example, derivation and conjugation refers to morphological awareness. Recent research in psycholinguistics shows that in order to comprehend the text the reader must have a metalinguistic knowledge, which means that the reader is aware of the structure of the language, knows how the texts are developed. It is a type of metacognition when the reader can think about how to use the language. [19] [20]. When defining metalinguistic awareness Lőrík [21] and Török & Hódi [22] point out the ability to think about the language as an object and manipulate it consciously. Metacognition is thinking about your own thoughts [23].

Vocabulary and word knowledge is another important factor to facilitate comprehension. Perfetti [24] developed "The lexical quality hypothesis" which suggests that reading skills are supported by knowledge of words, including orthography, phonology, morphology and meaning. The identification of words is essential for understanding sentences. The reading of the text starts with the identification of individual words, i.e. the processes which convert the visual input into linguistic presentation. The reader must combine the meaning of each sentence and evaluate the information in the text in order to comprehend the text. The reader needs to use his/her prior knowledge so that he could do this evaluation. It is this level of comprehension that reflects the situation. The reader chooses the meaning appropriate to the situation.

In literature decoding problems are associated with phonological awareness. Phonological awareness refers to the understanding of and access to the sound structure of spoken language, that is the consciousness that oral language can be broken down into individual words, and words into phonemes [25]. Lőrík [26] suggests that phonological awareness is the ability to handle the language as an object. Csépe [27] points out that phonological awareness is the ability to break the inner structure of the word into small parts, analyze and manipulate the phonemes. A main theoretical framework has been recently proposed which assumes that learning to read is learning to find shared grain sizes in orthography and in phonology [28]. Several studies have been written to show the relationship between different factors and reading comprehension.

Rothou et al. [29] investigated the contribution of phonological awareness, morphological awareness and vocabulary to decoding in grades 1 and 2 using structural equation modeling (SEM) analysis. SEM analysis with latent variables revealed that in grade 1 only phonological awareness predicted reading, while in grade 2 decoding was not predicted by any of the predictors involved. They found that in a phonologically simple language such as Greek, phonological awareness has a central role in the prediction of decoding during the first year of reading acquisition. On the contrary, morphology does not play a role in early word reading even though Greek is a morphologically complex language. Participants were 120 first graders and 123 second graders. They were native speakers of Greek and none of them had reported reading problems. All the children were randomly selected from 15 primary schools

Figure 1 [30] Model of decoding skills in grades 1 and 2 by Rothou et al.



Morphological awareness is defined as “children’s conscious awareness of the morphemic structure of words and their ability to reflect on and manipulate that structure” [31] and it affects children’s reading development in several languages, such as English [32]. Morphological awareness is an ability to manipulate the smallest meaningful units or morphemes.

Kinanti et al.[33] examined the effect of morphological awareness on reading comprehension. The aim of the study was to find out whether there is a significant correlation between students’ morphological awareness and their comprehension. The research used ex post facto design. They examined six classes of second graders. Their result showed there was a positive correlation between students’ morphological awareness and their reading comprehension. They used morpheme identification awareness and morphological structure awareness for research. The students had to separate affixes of complex words They also examined vocabulary knowledge. It was found that understanding of words contribute to reading comprehension.

Deacon et al. investigated the role of morphological awareness in reading comprehension. “ In this longitudinal study, they measured 100 English-speaking children’s morphological awareness, word reading skills, and reading comprehension at Grades 3 and 4, in addition to their phonological awareness, vocabulary, and nonverbal ability as control measures. The analysis showed that word reading skills partially mediated the relationship between morphological awareness and reading comprehension at each grade. Further, children’s early morphological awareness partially explained children’s gains” [34].

Liping and Wu examined the contribution of metalinguistic awareness including morphological awareness, phonological awareness and orthographical awareness to reading comprehension, and the role of reading fluency as a mediator of the effects of metalinguistic awareness on reading comprehension from grades 2 to 4.They tested a hundred and fifteen elementary students in China, they administered a test battery that included measures of morphological awareness, phonological awareness, orthographical awareness, reading fluency, reading comprehension and IQ. Morphological awareness uniquely explained 9%, 10% and 13% variance of reading comprehension respectively from grade 2 to grade 4, however, phonological awareness and orthographical awareness did not contribute to reading comprehension. Reading fluency partially mediated the effect of morphological awareness on reading comprehension in grades 2-4. Reading fluency was a significant link between morphological awareness and reading comprehension in grades 2-4 [35].

Casalis et al. examined how specific the connection is between morphological awareness and spelling. Participants included French children. 42 (30 females) children in Grade 3 and 38 (15 females) children in Grade 4. Their study suggests that Grade 3 and 4 French-speaking children

rely on morphological structure to spell sounds for which there are several alternative spellings. Further, morphological awareness appears to be generally connected to spelling[36].

Valéria Csépe and Leo Blomert [37] focus on cognitive contributions to reading. They point out that children have to be trained over a long period of time before they start reading fluently. They emphasize the importance of phonological processing, phonological awareness and the Rapid Automatized Naming(RAN) in the process of reading. "Theories of reading development assume that children increasingly rely on automatic visual word recognition thereby reducing the importance of phonological decoding skills for skilled reading" [38].

Fluency is the ability to read a text accurately and smoothly. When fluent readers read aloud, their expression, intonation, and pacing sound natural, it sounds much like speaking. Children increase their vocabulary through reading comprehension. Children continually learn new words through speaking and listening to the people around them. When children learn to read they understand that the words on the page correspond to the words they encounter in spoken Hungarian. If there are too many unfamiliar words in the text it makes comprehension impossible. Cs. Czachesz points out the importance of vocabulary in comprehension, she mentions that reading stories aloud for small children improve their memory and cognitive skills [39].

Metacognitive reading strategies also help children improve reading comprehension skills. As it has already been mentioned text comprehension is the interaction between the reader and the text. Reading is more than merely decoding words on a page. There are reading strategies which can help creating meaning from a text. Some of the most important ones are the following: monitoring comprehension, using prior knowledge, making predictions, questioning, recognizing story structure, summarizing. The experiences of the last two decades proved that the effective reading instruction is based on reading strategies [40], [41]. It is a very important achievement that basal readers increasingly contain different kind of texts, which take children age-related characteristics and the demands of modern society into consideration.

Nowadays, textbooks for students include not only texts for general understanding but also texts which contain , for example, charts, graphs, tables, analyses and balance sheets. Different types of texts require different kinds of strategies. Selecting the purpose of reading makes comprehension easier and more effective. These purposes might include reading to search for simple information, reading to skim quickly, reading to learn from texts, reading to integrate, reading to write, reading to critique texts, reading for general comprehension[42], [43].

4 Conclusion

This article gave a short overview of the main factors influencing reading comprehension. Comprehension is quite complex thus there is no consensus about the most important factors. However, there is a tendency among the researchers to agree on the fact that children need get a systematic training to learn morpheme phoneme correspondence and develop phonological awareness. Phonological awareness is closely related to phonics because both involve the connection between sounds and words. Studies show that morphological awareness also influences reading comprehension and spelling abilities. Research results show that morphological awareness contributes to the understanding of the text. It seems that both the age group and the language itself influences how strong relationship is between morphological awareness and the reading comprehension. All the studies mention that reading instruction should include systematic training not only in phonological but in morphological awareness too. For further development of reading comprehension metacognitive reading strategies can be implemented, however, they only work if learners are aware of the phonological and morphological features of the text. In addition, they know the words in the text and understand how the language works.

Acknowledgment

This research is supported by **EFOP-3.6.1-16-2016-00006"The development and enhancement of the research potential at John von Neumann University"** project. The Project is supported by the Hungarian Government and co-financed by the European Social Fund.

References

- [1] Csapó B. (2015). A magyar közoktatás problémái az adatok tükrében. [Problems of the Hungarian Public Education based on data.] *Iskolakultúra*, 25 (7-8), 4-17.
- [2] Hirsch, E.D. (2003). Reading comprehension requires knowledge-of words and the world. *American Educator*, 27(1), 10, 12-13, 16, 18-22, 28-29. http://www.aft.org/pdfs/americaneducator/spring2003/AE_SPRNG.pdf
- [3] Dehaene, S.(2004) Evolution of human cortical circuits for reading and arithmetic: The “neuronal recycling” hypothesis In S. Dehaene, J. R. Duhamel, M. Hauser & G. Rizzolatti (Eds.), *From monkeybrain to human brain* (2004). Cambridge, Massachusetts: MIT Press
- [4] Csépe Valéria (2006) *Az olvasó agy*, Akadémiai kiadó, Budapest
- [5] Urquart, S & Weir, C (Eds) (1998) *Reading in a foreign language: process, product and practice*, Harlow: Longman
- [6] Goodman, K.S (1973) *Miscue analysis: Applications to Reading Instruction*.ERIC Clearinghouse on Reading and Communication skills, Urbana, Ill
- [7] Pearson, P. D.: (2004). *The Reading Wars*. *educational Policy*, 18(1), pp. 216-252
- [8] Dehaene, S. (2009.) *Reading in the Brain*. New York NY: Penguin Viking
- [9] RAND Reading Study Group, Snow, C.(2002). *Reading for Understanding, toward an R&D Program in Reading Comprehension*. RAND, Santa Monica
- [10] RAND Reading Study Group, Snow, C.(2002). *Reading for Understanding, toward an R&D Program in Reading Comprehension*. RAND, Santa Monica
- [11] Skinner B.F. (1957) *Verbal behavior*. New York: Appleton-Century-Crofts.
- [12] Dąbrowska E(2015) What exactly is Universal Grammar, and has anyone seen it? *Front Psychol.* 2015 Jun 23;6:852. doi: 10.3389/fpsyg.2015.00852. eCollection 2015. Review.PMID:26157406
- [13] Chomsky, N. (2000) *New Horizons in the Study of Language and Mind*. Cambridge.
- [14] RAND Reading Study Group, Snow, C.(2002). *Reading for Understanding, toward an R&D Program in Reading Comprehension*. RAND, Santa Monica
- [15] Katz & Frost(1992) *The Reading Process is different for Different Orthographies: The Orthographic Depth Hypothesis*, in Haskins Laboratories Status Report on speech research, SR./112, pp.147-160
- [16] Perfetti and Dunlap, 2008 in Grabe&Stoller(2011.) *Teaching and Researching Reading*, Great Britain, Pearson Education Limited.
- [17] Katz & Frost(1992) *The Reading Process is different for Different Orthographies: The Orthographic Depth Hypothesis*, in Haskins Laboratories Status Report on speech research, SR./112, pp.147-160
- [18] Ziegler J & Goswami U (2005) *Reading Acquisition, Developmental Dyslexia, and Skilled Reading Across Languages: A Psycholinguistic Grain Size Theory*, *Psychological Bulletin* Copyright 2005 by the American Psychological Association. 2005, Vol. 131, No. 1, 3–29 0033-2909/05/\$12.00 DOI: 10.1037/0033-2909.131.1.
- [19] Adamikné,Jászó, 2003 in Török &Hódi (2015) *A morfológiai tudatosság fejlődése, mérési lehetőségei és az olvasásszövegértéssel való kapcsolata*, <http://www.anyanyelv-pedagogia.hu/cikkek.php?id=551>
- [20] Liping L& Wu, X(2014) *Effects of Metalinguistic Awareness on Reading Comprehension and the Mediator Role of Reading Fluency from Grades 2 to 4*, 4. *PLoS ONE* 10(3): e0114417. doi:10.1371/journal.pone.0114417.
- [21] Lőrík J. (2006) *A gyermeki fonológiai tudatosság megismeréséről*. *Beszédgyógyítás*, 17/2, 32–6
- [22] Török T.&Hódi Á.(2015) *A morfológiai tudatosság fejlődése, mérési lehetőségei és az olvasásszövegértéssel való kapcsolata*, <http://www.anyanyelv-pedagogia.hu/cikkek.php?id=551>
- [23] Flavell, J. H. (1979). *Metacognition and cognitive monitoring: a new area of cognitive-developmental inquiry*. *American Psychologist*, 34, 906-911
- [24] Perfetti, C., & Hart, L. (2002). *The lexical quality hypothesis*. In L. Verhoeven, C. Elbro, & P. Reitsma (Eds.), *Precursors of functional literacy* (pp. 189-213). Amsterdam: John Benjamin
- [25] Wagner et al. (1997) *Changing relations between phonological processing abilities and word-level reading as children develop from beginning to skilled readers: A 5-year longitudinal study*. *Developmental Psychology*. 1997;33:468–479.
- [26] Lőrík J (2006) *A gyermeki fonológiai tudatosság megismeréséről*. *Beszédgyógyítás*, 17/2, 32–6
- [27] Csépe V. (2006) *Az olvasó agy*, Akadémiai kiadó, Budapest.
- [28] Ziegler J & Goswami U (2005) *Reading Acquisition, Developmental Dyslexia, and Skilled Reading Across Languages: A Psycholinguistic Grain Size Theory*, *Psychological Bulletin* Copyright 2005 by the American Psychological Association. 2005, Vol. 131, No. 1, 3–29 0033-2909/05/\$12.00 DOI: 10.1037/0033-2909.131.1.
- [29] Rothou et al.(2013) *Predicting Early Reading in Greek: The Contribution of Phonological Awareness and Non-Phonological Language Skills*, 3rd World Conference on Learning, Teaching and Educational Leadership – WCLTA 2012 (2013) 1504 – 1509
- [30] Rothou et al. (2013) *Predicting Early Reading in Greek: The Contribution of Phonological Awareness and Non-Phonological Language Skills*, 3rd World Conference on Learning, Teaching and Educational Leadership – WCLTA 2012 (2013) 1504 – 1509
- [31] Carlisle, J. F.(1995), *and affects children’s reading development in several languages, such as English*
- [32] Carlisle J. F. (2000). *Awareness of the structure and meaning of morphologically complex words: Impact on reading*. *Reading and Writing*, 12, 169–190.
- [33] Kinanti et al.(2012) *The Relationship Between Students’ Morphological Awareness and their Reading Comprehension* <http://jurnal.fkip.unila.ac.id/index.php/123/article/view/9184>
- [34] Deacon et al.(2014) *The Relation between Morphological Awareness an Reading Comprehension: Evidence From Mediation and Longitudinal Models*, ISSN:1088-8438 (Print)1532-799x(Online) journal homepage: <http://www.tandfonline.com/loi/hssr20b> *Scientific Studies of Reading*, p.432., 2014

- [35] Liping L& Wu, X(2014)Effects of Metalinguistic Awareness on Reading Comprehension and the Mediator Role of Reading Fluency from Grades 2 to 4, 4. PLoS ONE 10(3): e0114417. doi:10.1371/journal.pone.0114417
- [36] Casalis at al.(2011)How specific is the connection between morphological awareness and spelling? A study of French children, Applied Psycholinguistics 32 (2011), 499–511, doi:10.1017/S014271641100018X
- [37] Csapó, B, & Csépe, V. (2012) Framework for Diagnostic assessment of Reading, Nemzeti Tankönyvkiadó, Budapest (p. 27).
- [38] Csapó, B, & Csépe, V. (2012) Framework for Diagnostic assessment of Reading, Nemzeti Tankönyvkiadó, Budapest (p. 27).
- [39] Cs. Cachesz, E. (2014) A szókincs és az olvasás kapcsolata iskoláskor előtt (Eds) Könyv és nevelés, ofi.hu/folyoiratszam/konyv-es-neveles-16-efolyam-2szam
- [40] Csíkos, Cs. és Steklács J. (2006): Metakogníció és olvasás. In: Józsa Krisztián (szerk.): Az olvasási képesség fejlődése és fejlesztése. Dinasztia Tankönyvkiadó, Budapest,pp. 75-88.
- [41] Steklács, J. (2013) Olvasási stratégiák tanítása, tanulása és az olvasásra vonatkozó meggyőződés, Nemzedékek Tudása Tankönyvkiadó Zrt., Budapest, 2013
- [42] Csíkos, Cs. és Steklács J. (2006): Metakogníció és olvasás. In: Józsa Krisztián (szerk.): Az olvasási képesség fejlődése és fejlesztése. Dinasztia Tankönyvkiadó, Budapest,pp. 75-88.
- [43] Grabe&Stoller, (2011.) Teaching and Researching Reading, Great Britain, Pearson Education Limited.