Various Models for Reading Comprehension Process

Parastoo Babashamsi (Corresponding author)

Department of Language Education and Humanities, Faculty of Educational Studies, Universiti Putra Malaysia, Malaysia

Tel: +601128538038   E-mail: p_babashamsi@yahoo.com

Saeideh Bolandifar

Department of Language Education and Humanities, Faculty of Educational Studies, Universiti Putra Malaysia, Malaysia

E-mail: sabolandifar@yahoo.com

Nahid Shakib

Department of Language Education and Humanities, Faculty of Educational Studies, Universiti Putra Malaysia, Malaysia

E-mail: nahid.shakib@yahoo.com

Abstract

In recent years reading can be viewed as a process, as a form of thinking, as a true experience, and as a tool subject. As a process, reading includes visual discrimination, independent recognition of word, rhythmic progression along a line of print, precision in the return sweep of the eyes, and adjustment of rate. In the same line, the present paper aims at considering the various models of reading process. Moreover, the paper will take a look at various factors such as schema and vocabulary knowledge which affect reading comprehension process.

Keywords: Reading comprehension, psycholinguistic model, bottom-up Model, top-down model, interactive model.

1. Introduction

A set of complicated processes and abilities are involved in reading comprehension. It is essential to assume numerous cognitive processes in the development of reading comprehension, mainly the reading of words (Abedi, 2008). According to Siegel (1993) five processes are involved in the acquisition of reading. Phonology is the first process that deals with the association of sounds with letters. The second process is the syntax which defined as the way in which words are put together to form phrases. Working memory is the third process, can be defined as an individual's ability to hold information in the short term memory. The fourth process that plays significant role in reading is the comprehension of meaning or semantic. The final process which is assumed to be important in the reading process, relates to orthography or the understanding of writing rules and knowledge of spelling.

Therefore, these abilities such as phonemic awareness, word identification, comprehension, reading fluency, and vocabulary specific abilities are essential to reading (Adams, 1990; Chill, 1967; Clay, 1993; Gough, Hoover, and Peterson, 1996; Snow, Burns, and Griffin, 1998; Stahl and Murray, 1998; Stanovich, 1994; Buly and Valencia, 2002). Readers who are proficient try to apply and use not only low-level of processing skills to recognize individual words, but also high-level of processing skills in order to collect information from different sources and to form "meaningful representations of text", and then make an effort to relate this text back to previous knowledge (National Accessible Reading Assessment Projects, 2006, p. 4). Thus, in reading a lot of processes and skills are combined to make the meaning of written text (Curtis and Glaser, 1983).

This view is taken into account four various models of the reading process: the psycholinguistic model, the bottom-up model, the top-down model, and the interactive model.

1.1 The psycholinguistic model

The ESL reading theory was under the influence of Goodman's (1967) psycholinguistic model of reading during 1966. Goodman regards meaning construction as a continuous process of testing the reading text. The reader strives to predict, to sample and to confirm or to change previous predictions, and consequently tests and samples the text again. In this model of reading comprehension, using all of the existing textual hints is not required for the skilled reader. If the reader is able to make suitable and related guessing, the less confirmation via the text is required, that is, the less visual perceptual information the reader needs. The basic psycholinguistic model was clarified by Coady (1979). He suggested a model in which reader's conceptual abilities and strategies act together with his background knowledge to understand the text.

Although the psycholinguistic model is considered as an interaction of factors; however, the role of background knowledge in reading process has not been emphasized in this model.

1.2 The bottom-up model

According to Dole, Roehler, and Pearson (1991), in the traditional view of reading, a set of hierarchical sub-skills are acquired by beginner readers consecutively to build toward comprehension ability. If readers are capable to master these skills, they will comprehend the text as they read. On the other hand, the main disadvantage of this model is overemphasizing on the formal features of the language, such as words and structure. Recognizing of words and their meaning refers to decoding which usually are utilized in the bottom-up processing model, whereas comprehension needs "relevant background knowledge and the application of general reading strategies, such as predicting the content of the text, guessing unknown words in the context, making inferences, recognizing the type of text and text structure, and grasping the main ideas of the paragraph" (Laufer, 1997, p. 20).

Thus, in terms of reading, according to Paran (1996), bottom-up model assumes that the reader recognizes every letter, organizes the perceived letter into words, and finally classifies the words into phrases, clauses, and sentences. Meaning at any level is accessed only once, and processing at previous levels is always completed. Based on the above explanations, it can be concluded that bottom-up model in reading comprehension begins from vocabulary to the sentence level. However, one drawback of such a reading model is that if students focus too much on decoding every single word, their understanding of the overall meaning will be hindered. Because the short-term memory has a limited capacity, a slow decoder is apt to forget the message of the preceding reading.

1.3 The top-down model

The top-down model is in direct opposition to the bottom-up model. In bottom-up model lower-level linguistic processing is required, whereas in top-down model, cognitive higher-level processes is necessary and the reader's elicitation to get enough information from a text is emphasized in order to verify or decline various expectations or prior knowledge (Bartlett, 1932). Here, "reading … is a selective process. It involves partial use of available minimal language cues selected from perceptual input on the basis of the reader's expectation" (Goodman, 1970, p.260). Therefore, in process of reading, the reader chooses from the available information to select and predict a decodable language structure and it cannot attributed to a perceptual process (Goodman, 1973, p. 164).

Top-down model is originated from one of the central reading theories called the 'schema theory'. According to Gunning (1996), a schema is defined as having a structured knowledge about people, places, things, and events in advance. The interaction between the reader's own knowledge and the text that results in comprehension is illustrated in schema theory (Kitao, 1990). This schema can be very extensive like a schema for natural disasters, or it can be limited such as a schema for a hurricane. An individual section is considered for filling and storing each schema. In reading comprehension, students are able to connect previous information in their mind with new information, and they add it to the previous "files" in order to use it in future.

Based on this theory, readers' degree of reading comprehension is different and is depended on how they extend their "files". According to Dubin and Bycina (1991), the psycholinguistic and the top-down model of reading are in good agreement. This is probably because in both models, there is interaction between the reader's background knowledge and the text. To sum up, for many researchers the top-down and bottom-up processing models of reading comprehension have always been the center of attention. In the top-down model or conceptual driven model these skills namely as skimming, scanning, triggering background knowledge, predicting, thinking of the author's intention, finding hints, contextual guessing, and associating image, are used. While in bottom-up processing, the literal comprehension, surface meaning, translation into L1 and using of dictionary are emphasized which have identified this model as "data driven" (Madden and Nebes 1980, Dubin and Bycina 1991, Carrell 1991, Stanovich 1980, Chastain 1988).

1.4 The Interactive model

The interactive model, according to Alyousef (2005), is referred to reading as 'interactive' process between a reader and a text and emphasizes on automaticity or reading fluency. In this model, the reader interacts with the text in order to extend the meaning, and the reader uses different types of knowledge such as linguistic or universal knowledge (through bottom-up processing) as well as schematic knowledge (through top-down processing).

Many researchers used to consider reading as a 'bottom-up' process (Ellis and Sinclair, 1989), where fluent comprehension requires ordering language input in an expedite way. It has been discussed among researchers whether access to meaning is facilitated through 'top-down' or 'bottom-up' processing. Whereas neither the bottom-up nor the top-down model of reading is sufficient for what happen during process of reading, hence, during the 1980s, researchers offered an alternative model of reading, which mixed these two views together: the bottom-up and the top-down. The result is called an interactive model of reading process (Perfetti, 1985; Rumelhart, 1981; Stanovich, 1980). Nowadays, popular 'interactive' model proposes that the most successful readers are both skillful 'bottom-up' processors of texts-they can transfer the language on the page into the information it embodies both quickly and precisely- and 'top-down' processors- they can connect this new information to the related knowledge they already have to make a reasonable meaning out of the text. This model also tells us that competent readers do these two things at the same time: they decode and comprehend as they read. While they become more capable in the former, they can give more attention to the latter, in what is theoretically called parallel processing (Eskey, 1997).

2. Factors affecting reading comprehention

Factors affecting reading comprehension research during the 1970s and 1980s have been recognized that many of the variables are related to the second language reading process (Elizabeth, 2005). Schema and vocabulary are identified as two major factors affecting reading comprehension (Johnson, 1981; Hudson, 1982; Carrell, 1983).

2.1 Schema theory (background knowledge)

Conventionally, reading comprehension is considered to only engage the learning of vocabulary and the interpretation of meaning (Anderson, 1994). Therefore, traditional language teaching methods involved teaching the bottom-up aspects of comprehension, such as word recognition and grammar (Zimmerman, 1997). However, following subsequent research into the effect of background knowledge on comprehension, the top- down aspects of comprehension such as schema theory became popular (Bartlett, 1932; Goodman, 1967; Schank and Abelson, 1977; Mandlers, 1984; Anderson and Pearson, 1988).

Authors of informational texts presuppose that readers already have some background knowledge about the topic. They exclude information they supposed to be part of the readers' previous knowledge. Thus, they do not give readers thorough background information concerning their materials (Iwai, 2007). Many researchers argued about the place of background knowledge in the reading process within the schema theory (Bartlett, 1932; Carrell and Eisterhold, 1983). Schema theory is concerned with "pre-existing knowledge structures stored in the mind"   (Nassaji, 2002, p. 444) and how readers connect their previous knowledge with the text (Ajideh, 2003; Alderson, 2000; Anderson, 1999). This theory envisages an information-processing model of the mind in which knowledge is stored in related bonds that can be evoked and activated to receive information (Anderson and Barnitz, 1984). There are various types of background knowledge in reading (Carrell and Eisterhold, 1983; Nassaji, 2002; Oller, 1995). Formal and content schemata are considered to be the most common types of background knowledge. Formal schema or textual schema (Singhal, 1998), can be defined as knowledge of language and linguistic rules regarding how the text is prepared and recognizing the main characteristics of a particular genre of writing (Alderson, 2000; Carrell, 1987, 1988; Carrell and Eisterhold, 1983). Content schema, is referred to knowledge of the content (Carrell and Eisterhold, 1983). There are two various types of content schema: background knowledge and subject matter knowledge. The background knowledge may or may not be related to the content of a special text, and the subject matter knowledge is related to the text content and the topic directly (Alderson, 2000).

2.2 Vocabulary knowledge

It has been realized that good readers have a higher level of vocabulary (Nagy, Anderson, and Herman, 1987). Alderson (2000, p.35) states that "measures of reader's vocabulary knowledge routinely correlate highly with measures of reading comprehension, and are often, in deed, the single predictor of text comprehension." However, research has shown that in order to get sufficient comprehension, readers require knowing 95-98% of the words in the text (Liu and Nation, 1985). This level of knowledge needs the reader to have a passive vocabulary of up to 20,000 words (Nation, 2001). According to Laufer (1989), fluency requires that a reader knows between 90 and 95 percent of the words in a text, and these words need to be understood automatically with the smallest conscious effort. Perfetti (1985) declares that lexical access is essential in reading because it is the central repeating process in reading.

3. Conclusion

To sum up, while the importance of reading and reading comprehension is well-established, and many researchers suggested various models of reading comprehension, in the same line, the present paper aimed at describing the psycholinguistic model, bottom-up processing model, top-down processing model, and the interactive model. According to the psycholinguistics model, reader's conceptual abilities and strategies act together with his background knowledge to understand the text. The bottom-up model considers reading as decoding a series of written symbols for making sense of the text. The main disadvantage of bottom up model is over emphasizing on the formal features of the language, mostly words and structure. In contrast to the bottom-up model, in top-down model cognitive higher-level processes is basis of this model in which the role of reader is emphasized elicit enough information from a text. The last model is the interactive model. In this interactive model, the reader tries to draw out the meaning through active interaction with the text.

References

Abedi, J. (2008). Classification System for English Language Learners: Issue and recommendation. *Educational Measurement: Issues and Practice*, 27(3), 17-31.

Adam, P. (1990). *Saltmarsh Ecology*. Cambridge University Press, Newyork.

Ajideh, P. (2003). Schema Theory- based Pre-reading Task: A Neglected Essential in the ESL Reading Class. *The Reading Matrix*, 3(1).

Alderson, C. (2000). *Assessing reading*. Cambridge: Cambridge University Press.

Alyousef, H. S. (2005).Teaching reading comprehension to ESL/EFL learners . *The Reading Matrix*,5 (2).

Anderson, N. J. (1999). *Exploring second language reading* .Boston, MA: Heinle and Heinle.

Anderson, R. C. (1994). Role of the reader's schema in comprehension, learning, and memory. In Ruddell, R. B., Ruddell, T. and Singer,H. (Eds), *Theoretical Models and Processes of Reading*. Newark: International Reading Association.

Anderson, B. and Barnitz, J. (1984). Cross-cultural achema and reading comprehension instruction. *Journal of reading*, 27, 103-107.

Anderson, R. C., and Pearson, P. D. (1988). A schema-theoretic view of basic processes in reading comprehension. In Carrell, P., Devine, J., and Eskey, D. (Eds), *Interactive Approaches to Second Language Reading*. Cambridge: Cambridge University press.

Bartlett, F. C. (1932). *Remembering*. Cambridge: Cambridge University Press.

Buly,M. and Valencia, S. (2002). Below the bar: Profiles of students who fail state reading assessments. *Educational Evaluation and Policy Analysis*, 24 (3), 219–239.

Carrell, P. L. (1987).Content and formal schemata in ESL reading. *TESOL Quarterly*, *21, 461–481*.

Carrell, P. L. (1988). Some causes of text- roundedness and schema interference in ESL reading. In P. L. Carrell , J. Devine, and D. E. Eskey (Eds.), *Interactive Approaches to Second Language Reading* (pp. 101–113). New York: Cambridge University Press.

Carrell, P. L. (1991). Second language reading: Reading ability or language proficiency? *Applied Linguistics*, *12(2),* 159-179.

Carrell , P. L., and Eisterhold , J. C. (1983). Schema theory and ESL reading. *TESOL Quarterly*, 17, 553–573.

Chall, J. S. (1967). *Learning to read: The great debate: An inquiry into the science, art, and ideology of old and new methods of teaching children to read, 1910–1965*. New York: McGraw-Hill.

Chastain, K. (1988). *Developing second language skills* (3rd end) . San Diego: Harcourt Brace Jovanovich, Inc.

Clay, M. M. (1993). *An observation survey of early literacy achievement* . Portsmouth, NH: Heinemann.

Coady, J. (1979). A psycholinguistic model of the ESL reader . In R. Mackay, B. Barkman, and R.R. Jordon (Eds), *Reading in a Second Language* (pp 5-12). Rowley, MA: Newbury House.

Curtis, M. E., and Glaser, R. (1983). Reading theory and the assessment of reading Achievement. *Journal of Educational Measurement, 20(2),* 133–147.

Dole, J. A., Duffy, G. G., Roehler, L. R., and Pearson, P. D. (1991). Moving from the old to the new: Research on reading comprehension. *Review of Educational Research,* 61, 239-264.

Dubin, F. and Bycina, D. (1991). Academic reading and the EFL/ESL teacher. In M. CelceMurcia (Ed), *Teaching English as a Second or Foreign Language*. Massachusetts: Heinle and Heinle Publishers.

Ellis, G. and Sinclair, B. (1989). *Learning to learn English*. Cambridge: Cambridge University Press.

Elizabeth, B. (2005). Progress and procrastination in second language reading. *Annual Review of Applied Linguistics, (25),* 133-150.

Eskey, D. E. (1997). Models of reading and the ESOL student: Implications and limitations. *Focus on Basics,* 1(B), 9-11.

Goodman, K. S. (1967). Reading: A psycholinguistic guessing game. *Journal of the Reading Specialist, 6,* 126-135.

Goodman, K. S. (1970). Reading as a psycholinguistic guessing game. In H. Singer and R.B. Rudell (Eds.), *Theoretical Models and Processes of Reading*. Newark, NJ. International Reading Association.

Goodman, K. S. (1973). On the psycholinguistic method of teaching reading. In F. Smith (Eds.), *Psycholinguistics and Reading*. New York: Holt, Rinehart and Winston.

Gough, P. B., Hoover, W. A., and Peterson, C. L. (1996). *Reading comprehension difficulties: Processes and intervention*. Mahwah, NJ: Lawrence Erlbaum Associates.

Gunning, T. G. (1996). *IMF Papers on Policy Analysis and Assessment*, Staff papers. Washington: International Monetary Fund Publication Services.

Hudson, T. (1982) .The effects of induced schemata on the "short circuit" in L2 reading performance. *Language Learning,* 32(1), 1-31.

Iwai, Y. (2007). Developing ESL/EFL learners' reading comprehension of expository texts. *The Internet TESL Journal,* 13(7).

Johnson, A. P. (1981). Effects on reading comprehension of language complexity and cultural background of a text. *TESOL Quarterly*, 15(2), 169-182.

Kitao, S. K. (1990). Textual schemata and English language learning. *Cross Currents*, 17, 147-154.

Laufer, B. (1997). The lexical plight in second language learning. In Coady, J. and Huckin, T. (Eds) . *Second Language Vocabulary Acquisition*. Cambridge: Cambridge University Press.

Laufer, B. (1989). What percentage of text-lexis is essential for comprehension? In C. Lauren and M. Nordmann (Eds.), *Special Language: From Humans Thinking to Thinking Machines* (pp. 316-323). Clevdon, Avon: Multilingual Matters.

Liu, N. and Nation, I. S. P. (1985) . Factors affection guessing vocabulary in context . *RELC Journal,* 16, 33-42.

Madden, D. J. and Nebes, R. D. (1980) .Visual perception and memory. In M. C. Withrock (Ed), *The Brain and Psychology* (pp. 141-210). New York: Academic Press.

Mandler, J. M. (1984). *Stories, scripts, and scenes: Aspects of schema theory.* Hillsdale, NJ: Lawrence Erlbaum.

Nagy, W., Anderson, R. and Herman, P. (1987). Learning word meanings from context during normal reading. *American Educational Research Journal*, 24, 237-270.

Nation, I. S. P. (2001). *Learning vocabulary in another language*. Cambridge: Cambridge University Press.

National Accessible Reading Assessment Projects (2006). *Defining reading proficiency for accessible large-scale assessments: Some guiding principles and issues*. Minneapolis, MN: Author.

Nassaji, H. (2002). Schema theory and knowledge-based processes in second language reading comprehension: A need for alternative perspectives. *Language Learning*, 52, 439–481.

Oller, J. W. (1995). Adding abstract to formal and content schema: Results of recent work in Peircean semiotics. *Applied Linguistics*, 16, 273–306 .

Paran, A. (1996). Reading in EFL: Facts and fictions. *ELT Journal*, 50(1), 25-34.

Perfetti, C. (1985). *Reading ability*. New York: Oxford University Press.

Rumelhart,D. E. (1981). Schemata: The building blocks of cognition. In J. T. Guthrie (Ed.), *Comprehension and Teaching: Research Reviews* (pp.3-36). Newark, Delaware: International Reading Association.

Schank, R., and Abelson, R. (1977). *Scripts, plans, goals, and understanding*. Hillsdale, NJ: Lawrence Erlbaum.

Siegel, L. S. (1993). Phonological processing deficits as the basis of a reading disability. *Developmental Review,* 13(3), 246–257.

Singhal, M. (1998). A comparison of L1 and L2 reading: Cultural differences and schema. *The Internet TESL Journal*, *4* (10).

Snow, C. E., Burns, M. S. and Griffin, P. (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.

Stahl, S. A. and Murray, B. A. (1998). Issues involved in defining phonological awareness. *Journal of Educational Psychology,* 86, 221–234.

Stanovich, K. E. (1994). Romance and reality. *The Reading Teacher,* 47*,* 280–291.

Stanovich, K. E. (1980). Toward an interactive- compensatory model of individual differences in the development of reading fluency. *Reading Research Quarterly*, 16, 32-71 .

Zimmerman, C. B. (1997). *Historical Trends in Second Language vocabulary instruction in second Language vocabulary acquisition.* Cambridge: Cambridge University Press 5-19.