

Comprehension Difficulties in Reading Disabled Children

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Abstract: Reading comprehension is the ability to read the text, process it and understand its meaning. Some children with reading disability struggle with the basic reading skill like decoding words and consequently, comprehending the text. Others, however, face difficulties in comprehending the text, while their word reading skill is quite normal. While the simple view of reading suggests that reading comprehension is an interactive effect of word decoding and listening comprehension ($RC = LC \times D$), it does not explain the phenomenon completely. Vocabulary, word knowledge and various cognitive processes, on the other hand, appear to be contributing importantly towards the reading comprehension skill of children. Remediation of these difficulties, therefore, is barely essential. Several remedial programmes have been developed for the purpose, but the most effective ones are the cognitive-based remedial programmes. Such programmes not only bring about improvement in the required skills of reading but also the underlying cognitive processes that ultimately enable these children to profit from normal classroom instructions.

Keywords: *Reading disability, comprehension difficulties, simple view of reading, word knowledge, PASS processes, cognitive-based remediation.*

I. INTRODUCTION

Reading comprehension is the ability to read the text, process it, and understand its meaning. In simple words, reading comprehension is the act of understanding what one is reading. The task, although appears simple, is not necessarily simple to teach, learn and practice. An individual's ability to comprehend text is influenced by his or her traits and skills, one of which is the ability to make inferences. Reading comprehension is an intentional, active, interactive process that occurs before, during and after a person reads a particular piece of writing. Reading comprehension is one of the pillars of the act of reading. While reading a text, a person engages in a complex array of cognitive processes. He or she simultaneously uses his or her awareness and understanding of phonemes, phonics (connections between letters and sounds and the relationship between sounds, letters and words) and the ability to comprehend or construct meaning from the text. All models of comprehension recognize the need for readers to build up a mental representation of text, a process that requires integration across a range of sources of information, from lexical features through to knowledge concerning events in the world (e.g., Garnham, 2001; Gernsbacher, 1990; Kintsch, 1998). It is the understanding and interpretation of what is read. To be able to accurately understand written material, children need to be able to (1) decode what they read; (2) make connections what they read and what they already know; and (3) think deeply about what they have read. One big part of comprehension is having sufficient vocabulary, or knowing enough word meanings. Readers who have strong comprehension are able to make decisions about what they read – what is important, what is fact, and what caused an event to happen.

Comprehension as a "creative, multifaceted process" depends on four language skills, i.e., phonology, syntax, semantics, and pragmatics (Tompkins, 2011). Proficient reading depends on the ability to recognize words quickly and effortlessly (Adams, 1994). It is also determined by an individual's cognitive development, which is "the construction of thought processes". Some people learn through education or instruction and others through direct experiences. There are specific traits that determine how successfully an individual will comprehend text, including prior knowledge about the subject, well developed language, and the ability to make inferences. Moreover, it is the ability to be self-correcting to solve comprehension problems as they arise (Tompkins, 2011).

The comprehension of text is a complex interaction between the reader and written language. In an effort to derive meaning from text, the reader employs a number of psychological processes such as perception, attention, memory, learning and motivation (Pearson & Stephens, 1994). Researchers within the last half of this century have examined the relationship between reading comprehension and psychological and cognitive processing theories in an attempt to understand these interactions better. The nature and origin of reading comprehension difficulties, however, are not so clear. Here our objective is to review what is known about comprehension difficulties in reading disabled children, with a view to address two major issues. First, although individuals who experience difficulty with reading comprehension can be identified, does it make sense to talk

about specific reading comprehension difficulties? Second, what are the causes of comprehension difficulties in reading disabled children? The focus here will be on children who appear to show selective impairments of reading comprehension. That is, their reading accuracy is within the normal range for their age, but their comprehension of what is read is substantially below average. Studies of such children allow us to identify cognitive systems that may be particularly crucial for the development of reading comprehension skill and that are relatively independent of the processes underlying the development of word recognition skill in reading.

II. COMPREHENSION DIFFICULTIES OF READING DISABLED CHILDREN

Reading disability is a condition in which the person faces difficulty in reading, usually caused by an unknown factor or factors. The unknown factor is the disorder that affects the brain's ability to receive and process information. This disorder can make it problematic for a person to learn as quickly or in the same way as someone who is not affected by reading disability. Children with reading disability have trouble performing specific types of skills or completing tasks if left to figure things out by themselves or if taught in conventional ways. This condition prevails despite conventional instruction, adequate intelligence and socio-cultural opportunity. It results from cognitive disabilities which are frequently of constitutional origin (Critchley, 1970). Reading disabled children face difficulties in reading comprehension because it affects their ability to understand the meaning of words and passages. Children with reading disability may also struggle with basic reading skills such as decoding words, but comprehension is the greater weakness. Some children with a reading disability can read aloud with little or no difficulty pronouncing words, but they do not understand or remember what they have read. Reading aloud, their words and phrases are often read with no feeling, no change in tone, no logical phrasing, and no rhythm. Reading disabled children do not understand why they have difficulty in comprehending. In order to assist these children we need to understand why and where their difficulties are occurring.

According to Perfetti (1994, p. 885), "there is room for lots of things to go wrong when comprehension fails." Although it is the case that reading comprehension deficits are often associated with word-level decoding difficulties (e.g., Perfetti, 1985), children who have "specific" reading comprehension difficulties are found to be able to read text, words, and non-words at age - suitable levels, but their reading comprehension is impaired. However, even restricting discussion in this way leaves a number of possible causes for these children's difficulties to be considered. Hence, there is a felt need to discuss these causes reflecting on the studies carried out in this direction and the methodological issues surrounding the same.

III. REVIEW OF RESEARCH FINDINGS

Perfetti (1985, 1994) on the basis of his studies opines that reading is primarily a language process and problems in learning to read arise primarily from linguistic processing problems. According to him effective use of low level linguistic knowledge is a major component of reading ability. He has demonstrated that one's general verbal ability determines his or her development of reading ability and that verbal efficiency has got a powerful influence on reading comprehension. In another study, Perfetti and his associates (1996) made it clear that text comprehension is a complex task that involves many different cognitive skills and processes. Consequently there are many different aspects of the reading process where difficulties may arise which may, in turn, contribute to these children's poor comprehension. In fact, impairment at the word - sentence - and discourse - level plays a causal role in comprehension difficulties in children. But, there are also studies (e.g., Oakhill et. al., 2003 and Nation et. al., 1998) revealing that children with poor comprehension skill perform poorly on reading comprehension tests while showing age - appropriate skill of word decoding. However, one methodological issue in these studies concerns the choice of tasks used to reveal the poor comprehender's profile. Oakhill and colleagues screened and selected poor comprehenders from regular mainstream classrooms based on performance on the Neale Analysis of Reading Ability (NARA-II; Neale, 1997). In this reading test, children read aloud short passages of text (generating a score for reading accuracy) and are then asked questions to assess their literal and inferential understanding of the text (generating a score for reading comprehension). Poor comprehenders are selected as children who show a significant discrepancy between their age-appropriate reading accuracy and their below-average reading comprehension. There are however, possible objections to this approach; one of which is that in this particular reading test (the NARA), reading accuracy and reading comprehension are not measured independently from one another. With this limitation in mind, Nation and colleagues (1998) selected poor comprehenders according to performance on tasks that assess the two components of reading (accuracy and comprehension) separately. In their studies, poor comprehenders were selected and defined as those children who achieve poor reading comprehension scores on the NARA, but achieve age-appropriate scores on a standardized test of "pure" decoding (non-word reading).

A second methodological issue concerns the nature of the comparison group of control children. Poor comprehenders may have age appropriate level of word - decoding skill. Hence to ensure that any difference between poor comprehenders and control children is not a consequence of group differences in basic decoding

skill, Nation and Snowing (1998) advocated matching the two groups for non-word reading ability. Following the same logic, Nation and colleagues also matched poor comprehenders and control children for nonverbal cognitive ability. This approach, of course, is not followed by other research groups (e.g., Yuill & Oakhill, 1991). but, as a minority of children selected as poor comprehenders show rather low cognitive ability (Nation, Clarke, & Snowling, 2002), failing to control for cognitive ability could result in spurious conclusions. Studies involving selection of poor comprehenders emphasize reading – age match design (e.g., Bryant & Goswami, 1986). But following the logic of reading – age match design, Stothard and Hulme (1992) and Cain, Oakhill, and Bryant (2000) reasoned that in order to identify causes of poor reading comprehension, poor comprehenders should be compared with younger, normally developing children whose comprehension skills are at a similar level. If poor comprehenders show impairments in a particular cognitive or linguistic skill relative to younger control children matched for comprehension age, that skill is unlikely to be a simple consequence of comprehension level. The third methodological note, thus, concerns the comprehension – age match design. With these methodological issues in mind, we return to the question of what causes poor reading comprehension in children selected as poor comprehenders and discuss them here.

IV. CAUSES OF READING COMPREHENSION FAILURE IN CHILDREN

4.1. Simple view of Reading

The simple view of reading (SVR) which is a model of the process of learning to read as proposed by Hoover & Gough (1990) explains Reading Comprehension (RC) as the product of Listening Comprehension (LC) and Decoding (D). The relationship is formalized in the equation, $RC = LC \times D$. This has been established through several studies involving not only the first language learners (L1) but also the second language learners L2 (e.g., Verhoever & Leeuwe, 2012). Such studies consistently show the role of decoding in the explanation of reading comprehension to be larger for beginning readers and the role of listening comprehension to become more prominent for more proficient readers (e.g., Best & Reitsma, 1998; Carver, 1993; Chen & Vellution, 1997; Juel, 1988; Perfetti, Landi, & Oakhill, 2005; Verhoever, Junmer & Hoover, 1993, Perfetti, 2008; Verhoever & Leeuwe, 2011). It is claimed that listening comprehension or the linguistic process involved in the comprehension of oral language strongly constrains the process of reading comprehension, that involves identification of word meanings, the representation of sentences, the drawing of inferences, and the identification of underlying text structure as well as the global gist of the text.

Automated word recognition (word decoding) frees mental resources for closer consideration of the meaning of a text and thereby allows readers to employ reading as a tool for the acquisition of new information and knowledge (National Reading Panel, 2000; Perfetti, 1998). But besides this, listening comprehension turns out to be an important predictor for reading comprehension. Research shows younger and poor readers to have more problems with listening comprehension than older and better readers (e.g., Cain & Oakhill, 1998; Yuill & Oakhill, 1991). In fact, listening comprehension and reading comprehension are so intricately inter-wined that progress on one variable more or less automatically promotes progress on the other (Perfetti et. al., 2005). Yet many researches view that the Simple View of Reading may hold good for languages like Dutch, Spanish and Finnish which are found to have a transparent orthography but not for English language which has got a more complex syllable structure and opaque orthography.

In fact, a critical evaluation of simple view of reading reveals that reading comprehension needs more than decoding and listening comprehension and more demanding texts need skilled reading. This involves making connections between different parts of the text, making connections with other texts, and making connections with what the learner already knows. It involves also drawing of inferences i.e., perceiving what is implied by the author as well as what is stated. Moreover skilled reading is an evolutionary process, i.e., as the reader makes his/ her way through a demanding text, comprehension of later passages makes room for reinterpretation of earlier ones. Skilled reading may also involve a consideration of the text's social context and an evaluation of its worth in terms of its practical, intellectual or imaginative contribution to our understanding of the world. Moreover, engagement in reading and commitment to it are both highly desirable qualities that are needed to be developed in children. For example, Sideridis et. al., (2006) in their study found that children with reading comprehension difficulties were found to be equipped with low cognitive skill and low motivation level referred to as 'helpless' group or low cognitive skill and high motivation level referred to as 'motivated low achievers' group. And all these qualities make more demands on the reader in comprehending the text than decoding and listening comprehension.

4.2. Vocabulary and Prior Knowledge

Learning to read written texts is not the same as learning to *understand* written texts. Reading comprehension involves understanding the words, seeing relationships among words and concepts, organizing ideas, recognizing the author's purpose, evaluating the context, and making judgments. Many children who successfully learn to read in grade one or two are unable to understand books they need to read by grade three or

four. One of the reasons for this is lack of adequate vocabulary and there is evidence suggesting that poor comprehenders have relative weaknesses in expressive and receptive vocabulary, indicative of lack of knowledge at the word level.

Prior knowledge is also an important aspect to successful reading and studies have shown that lack of cultural familiarity with the subject matter has a greater impact on reading comprehension of a passage than the pre-teaching of vocabulary. The child's ability to recall information and make inferences is enhanced when they are familiar with the subject matter. Thus, moving beyond the meaning of individual words, domain knowledge is also considered crucial for comprehension. Appreciation of the domain that is being referred to in a text allows the reader to move from a word- or propositional-level representation of the text to one which integrates this knowledge with a broader body of background knowledge, thus allowing the reader to build a potentially inference-rich mental model of the situation or event. Prior knowledge about a text predicts comprehension of it (Spilich, Vesonder, Chiesi, & Voss, 1979). Clearly then, complete lack of knowledge will result in a complete lack of comprehension. Yet, this is not the whole story, because comprehension weaknesses are still apparent when care is taken to include vocabulary that is familiar, and when domain knowledge is to some extent controlled by teaching the children a novel knowledge base from which comprehension is subsequently assessed (Cain et al., 2001).

Rather than describing knowledge as being present or absent, a different approach, therefore, is to ask whether individuals differ in the extent to which they activate knowledge spontaneously, or bring it to bear rapidly and efficiently at the appropriate time. For example, Nation and Snowling (1998) reported that poor comprehenders were slower to make semantic judgments than control children. In a similar view, Cain and Oakhill (1999) reported that poor comprehenders' ability to make inferences increased when they were assisted to find the relevant part of the text. These two observations are instances that poor comprehenders may have the required knowledge, but fail to deploy it either quickly or spontaneously. Alternatively, however, these observations could be interpreted as indicative of lack of knowledge in that, it is only when knowledge is thoroughly understood and properly integrated that it can be reflected on rapidly, or used to trigger inferences. But all these skills certainly are the reflection of the reader's strength in specific cognitive processes that are involved in reading. These have been discussed below.

4.3. PASS Processes and Reading Achievement

Reading is the function of linguistic competence of the reader that coexists with one's cognitive maturity. In the last three decades, therefore, several attempts have been made to explain reading behaviour in terms of specific cognitive processes within the framework of an information processing model of intelligence called PASS model (Das, Kirby & Jerman, 1975, 1979; Naglieri & Das, 1988, 1990). This model which is based on the neuropsychological studies of A. R. Luria (Luria, 1966, 1970, 1980) explains all intellectual operations in terms of four different but interrelated cognitive processes, namely, planning, attention, simultaneous and successive (PASS) processes which are carried out in different areas of the brain.

Attention refers to the waking state of the cortex and is required for optimal cortical activity. Attention, whether selective or sustained is carried out in the first block of the brain that includes the brain stem, the lower cortical area and the Reticular Activating System (RAS). The second block which includes the occipital, temporal and parietal lobes of the cortex is responsible for carrying out the processes of coding that refers to storage and processing of information. Two different modes of coding, namely, simultaneous and successive commonly underlie all mental activities. Simultaneous processing involves organization of information into a quasi-spatial and relational manner, whereas, successive processing involves organization of information into a temporally based sequential manner. These two processes of coding form the basis for the operation of the third process that is planning. Planning, the central concept of the PASS model is the function of the third block of the brain that entails the frontal, especially the prefrontal areas of the cortex. It involves activities like searching, goal setting, generation, selection and execution of plans or strategies, performance monitoring, evaluating the course of an action and decision making. Hence it determines the nature of coding. Planning is a higher order cognitive process and is considered to be the essence of human intelligence (Das, 1984).

The PASS processes have been found to be contributing quite importantly to the reading achievement of children. Thus, attention helps the reader to focus on relevant information to the exclusion of the irrelevant ones while going through the text, whereas, coding helps in processing and storing the information for their further use. In fact, successive coding involves sequential processing of linguistic input which serves as a prerequisite for deeper level of semantic analysis of the same that involves simultaneous processing. Thus, successive processing helps in word decoding, particularly in earlier grades. Reading comprehension, on the other hand, depends on simultaneous processing at any grade. Both the processes, therefore, operate in a cyclical manner in the entire process of reading. Planning, on the other hand, helps the reader to adopt suitable strategy (strategies) so as to operate on the information in the most effective manner and reach the goal. Reading comprehension as a complex cognitive activity involves several skills like activating relevant background information, questioning, generating inferences while reading, and combining information in working memory

to form mental representations of the text. Hence, a strategic approach is barely essential for successful reading (Ackerman, Dykman & Gardner, 1990; Cummins & Das, 1978; Das, 1988; Das, Bisanz & Mancini, 1984; Das, Snart & Mulcahy, 1982; Leong et. al., 1985; Mahapatra, 1990, 2015a, 2015b; Mahapatra & Dash, 1999; Naglieri & Das, 1990; Das, Naglieri & Kirby, 1994; Das, Parrila & Papadopoulos, 2000). Skilled readers take appropriate decision in this direction so as to reach the goal. Poor or disabled readers, on the other hand, exhibit deficit in one or more of the PASS cognitive processes and thus, experience difficulties in reading and comprehending the text.

V. CONCLUSION

Reading comprehension as a complex cognitive activity depends on several cognitive skills and processes. Word decoding may be a basic prerequisite for the same and proficient reading may depend on the ability of the reader to recognize words quickly and effortlessly. However, all those who experience comprehension difficulties do not exhibit impairment in word decoding or experience a phonological bottleneck. Even a simple view of reading, which explains reading comprehension to be an interactive effect of word decoding and listening comprehension and fits well into a language system with a transparent orthography does not appear to explain fully 'English' reading because of the opacity of its orthography. Remediating reading comprehension difficulties of disabled readers, therefore, is barely essential. Thus, children may be taught to adopt reading comprehension strategies like identification of single words, sentences, identifying main ideas in a text and the most important relations between the various components of a piece of text that may directly improve their reading comprehension skill (Dickson, Simmons & Kameenui, 1995). But since cognitive processes like PASS are importantly involved in reading, attempts have been made to improve the reading skills of children through programmes like PREP and COGENT that are based on the PASS theory of intelligence and have been found to be effective (Brailsford et. al., 1984; Das, Mishra & Pool, 1995; Mahapatra et. al., 2010). Such programmes not only improve reading skills, i.e., both word decoding and reading comprehension, but also the underlying cognitive processes, especially the simultaneous and successive processes in children. For example, Mahapatra and associates (2010) in their study found substantial enhancement of the treated group's reading comprehension ability following remediation through PREP. The programme had also a beneficial effect on word reading even when this group of readers had close to average scores in word decoding before remediation. Moreover, the cognitive-based remediation programme resulted in an enhancement in simultaneous processing, in the treated group which was at sub-average level at the beginning of the study. More importantly, PREP and COGENT not only improve the reading skills of native speakers of English, but also of those who use English as their second language. Following the training such children are more likely to benefit from regular classroom instructions. Teachers, parents and school psychologists, therefore, can work together in this direction to help children to become independent learners.

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