

Understanding Reading: A Model of Meaningful Reading

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Abstract

A theory of reading provides the foundation for reading research, instruction and remediation. The Simple View of Reading (SVR) forms the basis of many present day understandings of reading. However, this and other current reading theories seem to be missing significant components that can contribute to a more holistic understanding of the reading process and subsequent models of reading. An incomplete understanding of the reading process can hinder efforts at targeted interventions and the full development of student abilities. This article serves to consolidate several ideas about reading to create a comprehensive, and thus more useful, Model of Meaningful Reading.

Reading is vital for academic achievement and is an important and necessary skill for successful functioning as a competent adult in today's society (Human Resources and Social Development Canada, 2003b). As an adult, the ability to read is not only important for practical and legal reasons (i.e., reading contracts or forms), but also for personal adaptive reasons (i.e., reading notes or emails from friends), maintaining a sense of self-efficacy in a literate culture, and larger socio-political reasons (i.e., being informed and participating in social or political discourse via written media like the newspaper) (Alves-Martins, Peixoto, Gouveia-Pereira, Amaral, & Pedro, 2002; Human Resources and Social Development Canada, 2003a). The ability to read allows us to feel successful, access information, and orient ourselves in the world among competing diversions (i.e., television programming, video games, etc.). It also facilitates the exercise of power in North American mainstream society (Pressley, 2002b),

allowing readers to see how others have transformed the world through the written word (Freire & Macedo, 1987). Reading helps us live and act in society with others.

Reading is such an important skill, that a considerable body of research has been devoted to the study of reading instruction and intervention. In the United States, the National Reading Panel (NRP) was commissioned to compile and consolidate findings from scientific studies (National Institute of Child Health and Human Development, 2000). Research was categorized into five categories: phonics, phonemic awareness, fluency, vocabulary, and comprehension (National Institute of Child Health and Human Development, 2000). Although this understanding of reading intervention and instruction has set a benchmark in how reading is understood, it has not wholly altered the theory of reading that researchers typically use. Reading researchers who are concerned with intervention or teaching methods, tend to place little emphasis on a comprehensive reading theory, often preferring to focus on selected aspects of reading (e.g., Archer, Gleason, & Vachon, 2003; Bhattacharya & Ehri, 2004; Block, Parris, & Whiteley, 2008; Cromley & Azevedo, 2007; Joseph & Schisler, 2009; Roberts & Scott, 2006). Although theorizing may not be the ultimate goal of such research, utilization of an incomplete reading theory in the research process has led to a body of research that is similarly incomplete. The NRP itself commented that few studies meeting its standards for scientifically valid research even exist in the area of reading comprehension (National Institute of Child Health and Human Development, 2000). This unbalanced state of research has flourished in an environment where an inadequate theory of reading has taken hold. A fuller and more complete theory of reading could help to direct research into the more elusive aspects of the reading process.

More alarming than an unbalanced state of research could be the possibility of an unbalanced state of teaching and learning in the classroom, as suggested by recent Canadian and

American literacy statistics (Human Resources and Social Development Canada, 2003b; Jetton & Lee, 2012; Willms, 2004). It only stands to reason that a complete model of reading is required for educators to effectively teach various components of reading. There are numerous subtle skills required in the full acquisition of reading comprehension, such as the utilization of phonetic principles or word analogies, grammar and inferencing, or accessing background knowledge. Many of these skills may be employed without conscious acknowledgement by the reader (Cain, 2010). This process may make it difficult for a proficient reader and teacher to instruct others in the skill of learning through reading. A complete model of reading can point to specific areas of intervention, and aid teachers in the instruction of the nuances of reading. Thus an inclusive model of meaningful reading could be considered useful both to researchers and practitioners alike.

There have been a plethora of reading theories set forth by multiple disciplines including speech-language pathology (e.g., Kamhi & Catts, 2005), educational psychology (e.g., Berninger, 2001; Pressley & Afflerbach, 1995), cognitive psychology (e.g., Kintsch, 1998) and medicine (e.g., Shaywitz, 2003; Sousa, 2007). Although these theories are useful to gain an understanding of reading, they are typically shaped, and somewhat limited, by the prevailing concerns of the field. For example, medical theories are aimed at definitive diagnoses through functional magnetic resonance imaging (fMRI), and subsequent remedies (Shaywitz & Shaywitz, 2004). Cognitive psychology, in contrast, deals with highly abstract and nearly entirely theoretically based constructs of reading (e.g., Kintsch, 1998; Kintsch & Rawson, 2005) that may not be considered particularly useful by practitioners in the field. A consolidation of these theories, however, can provide a more holistic understanding of the reading process. The Simple View of Reading (SVR) (Hoover & Gough, 1990) will be used as the starting point. This model

will be expanded with input from the Modified Triangle (Bishop & Snowling, 2004). From here various theories and ideas about reading comprehension (Cain & Oakhill, 2006; Cromley & Azevedo, 2007; Graesser & Britton, 1996; Kamhi & Catts, 2005; Kintsch, 1998; Kintsch & Rawson, 2005; Perfetti, Landi, & Oakhill, 2005; Pressley, 2002b; Snow & Juel, 2005) will be pulled together to form a Model of Meaningful Reading—a foundational model accounting for the complex cognitive processes involved in reading.

The Simple View

The Simple View of Reading (SVR) is a basic theory of reading comprehension developed by Hoover and Gough (1990). The SVR consists of two factors, decoding and oral language comprehension, which have reading comprehension as their product (Hoover & Gough, 1990). This point of view suggests that reading comprehension is a form of linguistic comprehension that enters the brain through visual decoding (Hoover & Gough, 1990). Decoding is the translation of symbols on the page into a word in the reader's aural vocabulary. From this point, oral language comprehension helps to interpret the meaning of the words. The relationship can be conceptualized in a figure (see Figure 1).

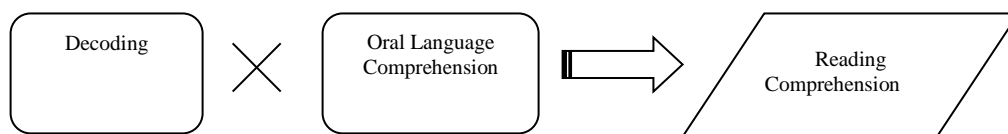


Figure 1. The Simple View of Reading (SVR)

Both factors are needed to support reading comprehension; if either factor is reduced, the overall result will also be reduced (Hoover & Gough, 1990). Likewise, when one skill area improves, the product, reading comprehension, will also improve if skill level in either factor is a

non-zero (Hoover & Gough, 1990). The model further suggests that an inverse correlation exists between decoding and oral language comprehension if a state of illiteracy exists (Hoover & Gough, 1990). This model provides a good starting point for understanding reading processes.

The SVR has some strong support as a method for both understanding reading, and reading deficits (Catts & Kamhi, 2005c; Catts, Adlof, & Weismer, 2006; Hoover & Gough, 1990; Roberts & Scott, 2006; Stuart, Stainthorp, & Snowling, 2008). A major part of decoding involves mapping phonemes (i.e., sounds) onto graphemes (i.e., letters). Phonological awareness, an understanding of the sounds of language, has been studied as a major component of decoding for three decades (see Scarborough, 2005 for an overview). Studies also suggest strong correlations between oral language skills, listening skills, and reading comprehension both in children and adults (Bell & Perfetti, 1994; Nation & Snowling, 2004; Wise, Sevcik, Morris, Lovett, & Wolf, 2007). These aspects of reading and thinking are thus married in the SVR to produce reading comprehension.

The SVR is also a good basic tool for categorizing assessment of reading disabilities (Catts & Kamhi, 2005b; Hoover & Gough, 1990; Kirby & Savage, 2008; Roberts & Scott, 2006). Generally speaking, individuals who are low in decoding, but high in oral language abilities are referred to as dyslexic; those who are low in oral language, but are strong decoders have a Specific Language Impairment (SLI) (Catts & Kamhi, 2005b). These divisions constitute broad guidelines and do not provide specific diagnostic criteria in terms of cut-off points due to the lack of psychometric evidence for precise definitions (Bishop & Snowling, 2004; Fletcher, Lyon, Fuchs, & Barnes, 2007). Groups can be further divided into sub-types (Catts & Kamhi, 2005b). Using the SVR as a model for categorizing reading disabilities can lead to more efficient assessment and intervention by suggesting a starting point (Catts & Kamhi, 2005b). For those

who are completely unfamiliar with the cognitive processes of reading, the model provides a simple way of understanding the reading process. Problems in the reading process can be identified in a general way, providing some guidance as to where intervention might start to take place (Catts & Kamhi, 2005b; Hoover & Gough, 1990).

For most casual discussion purposes, the broad categories in the SVR are a sufficient breakdown of reading skills; however, for a more refined understanding of reading, this model is too simplistic (Hoover & Gough, 1990; Kirby & Savage, 2008; Pressley et al., 2009). The SVR is a starting point. Hoover and Gough (1990) suggested that the factors in the SVR be seen as categories of skills; each category contains many discreet skill areas (as will be discussed further in subsequent sections). However, if intervention is to occur at critical points of deficit, a more precise model is required. For example, if an educator is merely given comprehension as an area of weakness, this problem is nearly impossible to remediate because reading comprehension may encompass over 30 different skills (i.e., summarizing, analyzing, creating themes, predicting, reflecting, inferencing, etc.) (Block & Pressley, 2002). Educators are in danger of implementing ineffective programs if they do not appreciate the finer skills involved in each category. Ineffective programs waste time and wear down the self-esteem of struggling students who may already feel they are a lost cause.

Theoretically, the SVR is unable to accommodate the differences between oral and written language (Cain, 2010; Kamhi & Catts, 2005). Written text can be more symbolic, abstract and contain many difficult ideas in a short amount of text. Particularly dense text can be found in many academic articles or highly regarded pieces of cultural literature. Although some oral cultures (such as Cree) may use dense dialogue and higher-order constructs in spoken communication, the majority of North American oral communication is repetitive,

straightforward, and concrete (Kamhi & Catts, 2005). Hoover and Gough (1990) briefly recognized these differences between formal and natural language, but did not adequately address the differences in their article. Furthermore, since spoken language is immediate and contextual (Cain, 2010), communicators can ask each other questions and get an immediate response if comprehension is incomplete. Written text requires the pervasive use of inferencing to fill the gaps in a text. For example, if someone were to say “I spilled eggs on Olivia, but she licked it off her fur,” the listener could ask, “Is Olivia your cat?” whereas the reader would be left to make her/his own inferences to fill in this gap. Pressley and colleagues (2009) contended that although oral language skills may account for some cognitive processes that occur while reading, many processes such as motivation, working memory, and processing speed, are not fully explained in the SVR. The SVR does not adequately account for the differences in cognition which must take place both as a result of the process of reading and as a function of the way ideas are transcribed.

Another problem with the SVR is that it can only explain comprehension that occurs through phonological processing. However, the Dual Route Approach would suggest that one pathway for reading, the lexical pathway, is taken directly from the text itself, by-passing phoneme-grapheme rules altogether (Castles, Bates, Coltheart, Luciano, & Martin, 2006). Although this theory is primarily concerned with explaining the phenomenon of sight words, it may be further suggested that in some instances words that are not a part of the oral vocabulary of the reader may figure prominently in her/his visual lexicon (Seidenberg & McClelland, 1989). A reader can visually analyze both the context and the parts of a word to arrive at an accurate understanding of its meaning without having previously heard the word (Seidenberg & McClelland, 1989). Repeated exposure to a word in various written contexts can allow a reader

to construct a semantic tag for the word without ever having heard it. If a reader encountered the word *immaculate*, for example, in a story indicating the cleanliness of a house, and again in the bible, and again in a story describing a white shirt, she/he may be able to create the tag of *clean* or *pure* for *immaculate*. Another example can illustrate how visual analysis can aid in comprehension. A reader may know a root word, such as *compensate* from her/his oral vocabulary. Knowing that the *-tory* or *-tive* suffixes indicate an adjective, the reader can then construct a meaning for the words *compensatory* or *compensative* without ever having heard the word itself. Thus an individual may understand the meaning and usage of a word without knowing the correct pronunciation. Furthermore, as Seidenburg and McClelland (1989) pointed out, people who are deaf or hard of hearing can learn to read without ever accessing the oral phonological route. The SVR sidesteps alternative modes of comprehension which do not involve phonological processing by focusing on beginning readers, who, the authors claim, do not yet use a visual route (Hoover & Gough, 1990). This is a logical argument, but makes the model incomplete for the majority of readers (Pressley et al., 2009). The SVR does not account for the depth or amount of processing that is required for reading comprehension, nor for the possibility that comprehension may occur independently of oral language. Thus, the model needs to be expanded to include more detailed information about the skills involved in each category. The Modified Triangle provides a good starting point.

The Modified Triangle

The Modified Triangle, adapted by Bishop and Snowling (2004) from Seidenberg and McClelland (1989), details the different processes required for decoding and can be applied to the thinking of both beginning and more advanced readers (Bishop & Snowling, 2004). This model shows the back and forth (connectionist) relationship between orthography (written text)

and phonology (the sounds of language). These components work in a bi-directional relationship with each other and with grammar and discourse to create word meaning (Bishop & Snowling, 2004). Grammar refers both to the grammatical morphology (word form) and syntactic context (arrangement of words) of a word that can offer clues about meaning (Bishop & Snowling, 2004). Discourse refers to inferences used to tie sentences together into a comprehensible body of text (Bishop & Snowling, 2004). For example, a reader sees the letters: c-a-t and attempts to map sounds onto the letters. The letter *c* (orthography) can make the /k/ or the /s/ sounds (phonology). The reader returns to the word and tries to match it with *cat* or *sat*. At this point syntactic knowledge (i.e., grammar) works to inform semantics (word meaning). So this reader looks at the sentence, *The cat is fat*, and decides that *sat* is not a grammatical fit with the sentence. She/he knows that cats can be overweight and thus infers (discourse processing) that c-a-t must be *cat*. Qualitative studies of adult readers who have overcome dyslexia suggest that knowledge about the vocabulary in a subject area helped them decode words (Fink, 1998). This illustrates the role that discourse can play in decoding. The Modified Triangle can be integrated with the SVR (see Figure 2).

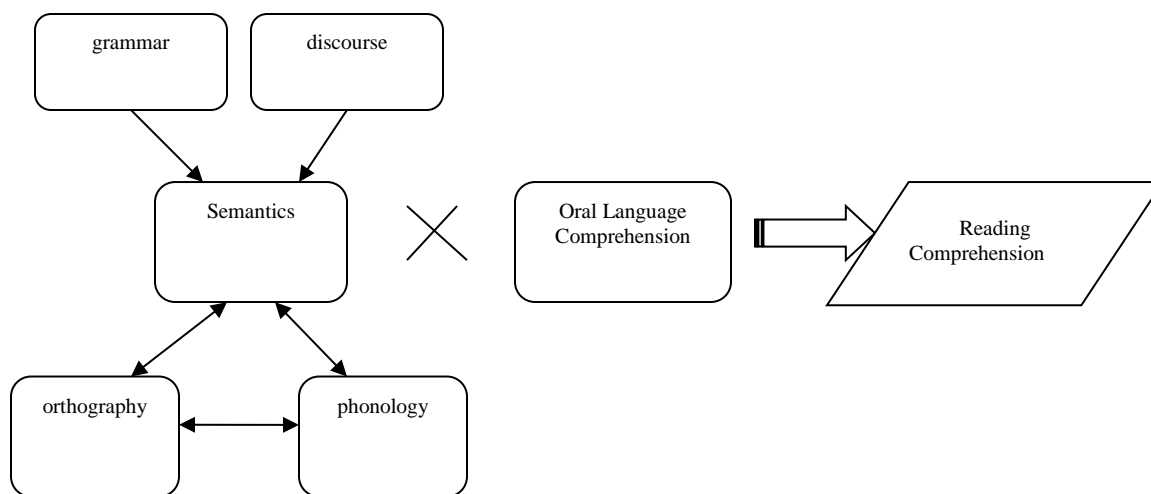


Figure 2. The Simple View of Reading (SVR) combined with the Modified Triangle

This expansion provides a more precise analysis of decoding skills. It allows for the specific identification of weaknesses and illustrates how that weakness can influence other processes. For example, a deficit in phonological processing influences both orthography and semantics. A student experiencing a delay in phonology likely struggles to read and write, being unable to access the written code, and may miss a lot of the meaning. The model combining SVR with the Modified Triangle is thus better able to explain how various observed behaviours relate to core skills in the area of decoding.

Alan Kamhi (2009) recently suggested that the definition of reading be limited to the aforementioned skills involved in decoding, in his Narrow View of Reading. Although there may be valid political and social reasons for doing so within an American context (Kamhi, 2009), this view of reading misses the point of the endeavour: to understand. Decoding without any sense of understanding is merely translating characters on the page into auditory signals. This exercise can be understood in terms of learning a foreign language. Mandarin, for example, has a phonetic version of the language called pinyin. A non-Mandarin speaker could read aloud an entire book without having the faintest idea of what was just read. Comprehension, as a complex and integral part of basic literacy, is a process that must be systematically taught over the span of a child's public schooling career and throughout content areas (Ehren, 2009). Comprehension and accompanying changes in thoughts and ideas are the primary motivation for reading. Reading does not end with the ability to decode.

With reading comprehension and subsequently occurring new thoughts and ideas as a goal of reading, the model requires further development. Although the sub-skills of decoding are accounted for, the expanded model maintains the shortcomings of oral language as an explanation for all further thought processes. At this point, skills that Hoover & Gough (1990) refer to as part of oral language comprehension, will be subsumed under the term reading comprehension. This redefinition allows for the inclusion of cognitive processes that occur as a result of both oral and print language. Furthermore, the goal of reading then expands beyond base comprehension towards a significant adjustment of thought on the part of the reader. The second part of the SVR model, oral language comprehension, needs to be explored to get to that point.

Reading Comprehension

Reading comprehension processes are exceedingly complex and not as concrete and measurable as decoding processes (Kamhi, 2005). A logical model can facilitate conceptualization of this process. Decoding can be thought of as the ability to transform symbols into basic units of meaning, sometimes referred to as the surface code (Perfetti et al., 2005). The next step of the model involves putting these smaller bits of meaning together to produce a basic understanding of the text as a whole. Much of the literature on reading comprehension does not differentiate between this stage and the next (e.g., Block & Pressley, 2002; Keene & Zimmermann, 2007; Kintsch & Rawson, 2005). However, a distinction vital to illustrate is that processing can either stop at this point or proceed. A functional understanding of the text can occur without further processing. Mundane factual or procedure information may be stored or forgotten without fundamentally altering a worldview. For example, one may read and understand a recipe without ever incorporating its ideas into one's concept of cooking. Not every text will change the cognitive patterns of every reader who understands the text, however a functional understanding is critical to further cognitive processing. Perfetti, Landi, and Oakhill (2005) distinguished between the two upper levels of reading comprehension by referring to them as text-based representations versus situational models. These levels roughly match with the levels of functional understanding and transformative understanding, as discussed in the Model of Meaningful Reading depicted in Figure 2.

Further discourse processing (through the process of making inferences) is necessary to develop a functional understanding of a text. Discourse appears in every step of the model, since it plays a pivotal role at different levels of the reading process. To begin to understand, a reader must put pieces of decoded meaning together in coherent representations (Graesser & Britton,

1996). Where coherence fails, lower level text-based inferences are called in to fill in the gaps (Perfetti et al., 2005). For example, if a reader reads the sentence: *Jimmy walked into the store and came out with a shiny new pair of shoes*, she/he will need to infer that Jimmy likely looked at different styles of shoes, tried some on, and decided to purchase a shiny pair. Many minute details are missing from the actual sentence, but proficient readers will naturally fill in this missing information (Perfetti et al., 2005). A reader may have to make many inferences, sometimes referred to as bridging (Barnes, Johnston, & Dennis, 2007), in order to understand a full paragraph. As this process occurs, a reader begins to understand the main idea of the paragraph and text. The main idea becomes increasingly solidified by further reading and inferencing. At this point sensory representations may begin to accompany the text, especially if the text is a narrative (Keene & Zimmermann, 2007). This process can be understood as making movies in one's head during the course of the story. Readers may find themselves questioning, clarifying, comparing or contrasting, organizing or creating themes (Block & Pressley, 2002). At this point a reader understands the text, has constructed a functional understanding, but has not yet progressed to a transformative understanding, which forms the last stage of the model.

The last stage of the Meaningful Model of Reading involves some kind of reconciliation between the reader's background knowledge and the text, which usually results in either a transformation or an extension of existing knowledge. This stage has similarities with a traditional schema approach, while incorporating elements of construction-integration theory (Kintsch, 1998). Background knowledge can include: (1) schema related to specific content knowledge, which involves knowledge about particular subject domains; and (2) interpersonal knowledge, which involves knowledge about human needs, behaviour, values, emotions, relationships, etc. (Kamhi & Catts, 2005). Further to this, background knowledge can also

include personal values, emotions, or memories. A reader uses this personal system of background knowledge and schema to create a network through which ideas, understood from the text, are passed. Ideas from the text may be linked to background knowledge, synthesized, analyzed, judged for bias, prioritized in terms of importance, evaluated, or reflected upon (Block & Pressley, 2002). The reader may call upon more sophisticated inferences to facilitate this process, including predictive (i.e., anticipate what will happen), associative (i.e., make connections within or outside the text), or explanatory (i.e., elaborate on what is described in the text) inferences (Kamhi & Catts, 2005). These inferences serve different functions in gaining a more abstract and deeper understanding of the text. The network then activates various elements that fit together—accepting, rejecting, or reconfiguring various aspects of the total set of information (Kintsch, 1998). In the end, the reader has integrated the new ideas into her or his way of thinking, and thus has produced a new body of synthesized cognition (Kintsch, 1998). New thoughts have been generated from the combination of ideas and cognitive processes.

At this point a cycle occurs, where new cognition feeds back into a lower level of discourse processing that once again informs decoding and the entire comprehension process takes place again. This cyclical nature refers to the concept of reading as both a top-down and bottom-up process. A reader both builds meaning from smaller units of language, but also uses larger ideas to inform her or his ability to decode smaller units (Bishop & Snowling, 2004; Kamhi & Catts, 2005; Pressley, 2002b; Swanson, 1999). This complex process can be assisted or suppressed by the whims of metacognition and emotion. Thus these two factors will be briefly considered in the following section.

Role of Metacognition and Emotion

The entire reading comprehension process takes place within the context of metacognition (i.e., the ability to think about thinking) and emotion. Metacognition has two main functions: self-management, as is the case in planning and allocating attention; and self-appraisal, which allows a reader to monitor her/his understanding and go back and amend meaning where necessary (Westby, 2005). Metacognition is important for reading comprehension because it gives a reader an approach and orientation to the text; a plan or purpose for reading (Perfetti et al., 2005; Westby, 2005). In addition, there are instances in every reader's experience when comprehension breaks down. Metacognition monitors the state of comprehension and produces fix-up strategies (i.e., re-reading, searching the context for clues, etc.) if needed (Perfetti et al., 2005). The entire comprehension process rests on the ability to be an active, metacognitive reader before, during, and after reading (Pressley, 2002). This allows readers to select from a number of different comprehension strategies during an interaction with text (Pressley, 2002). Difficulties in metacognition, and specifically fewer instances of self-monitoring, have been associated with lower comprehension across ages (Hacker, 1997).

Emotion is another component of context that can include feelings such as interest and motivation. Neuroscience offers an interesting perspective on motivation. Motivation is a desire to do something; it is a feeling. The limbic area of the brain, sometimes referred to as the old mammalian brain, is used in the generation and memory of emotions (Sousa, 2007). Paradoxically, this old mammalian brain requires stimulation in order to access those higher-order thought processes needed for reading. To read, the brain is required to coordinate the visual cortex, temporal lobe, and the frontal lobe to organize visual, auditory, and comprehension processes (Sousa, 2007). Most importantly, however, is the fact that the temporal lobe, this

incredible tool for higher-order thinking and planning, is ruled by the basic mammalian brain, or limbic area (Sousa, 2007). Experts have repeatedly acknowledged that reading can only occur when a combination of skill and will are present (Block & Pressley, 2002; Perfetti et al., 2005). Thus motivation must be stimulated in the limbic region before reading processes in the frontal lobe can be affected (Sousa, 2007). The entire context works to facilitate or inhibit the course of creating meaning at any point in the process.

A Model of Meaningful Reading

Ideas about decoding, comprehension, and the context in which they occur can be visually represented in a model. Sensory input occurs in the orthography (written word), which is informed by phonology (Bishop & Snowling, 2004). Grammatical structures and discourse aid in the discernment of the meaning of the word (i.e., semantics) (Bishop & Snowling, 2004). Discourse processing and selected reading strategies help to form a functional understanding of the text (Perfetti et al., 2005). From this point, the ideas in the text are integrated with a network of further inferences and background knowledge (Cromley & Azevedo, 2007; Kintsch, 1988). The result is a combination of new and old ideas (i.e., synthesized cognition). Thus the final Model of Meaningful Reading can be considered (see Figure 3).

Discourse processing figures prominently in the model and thus warrants a little more explanation. Inferencing is the key skill associated with discourse processing (Bishop & Snowling, 2004). Inferences have been found to be a leading predictor of global reading comprehension ability, even when background knowledge, vocabulary, and decoding ability have been controlled (Cain & Oakhill, 1999). Kintsch and Rawson (2005) noted that the role of inferencing in reading comprehension cannot be overestimated since this skill is necessary for comprehension at local (sentence) or global (manuscript) levels. Of particular interest is their

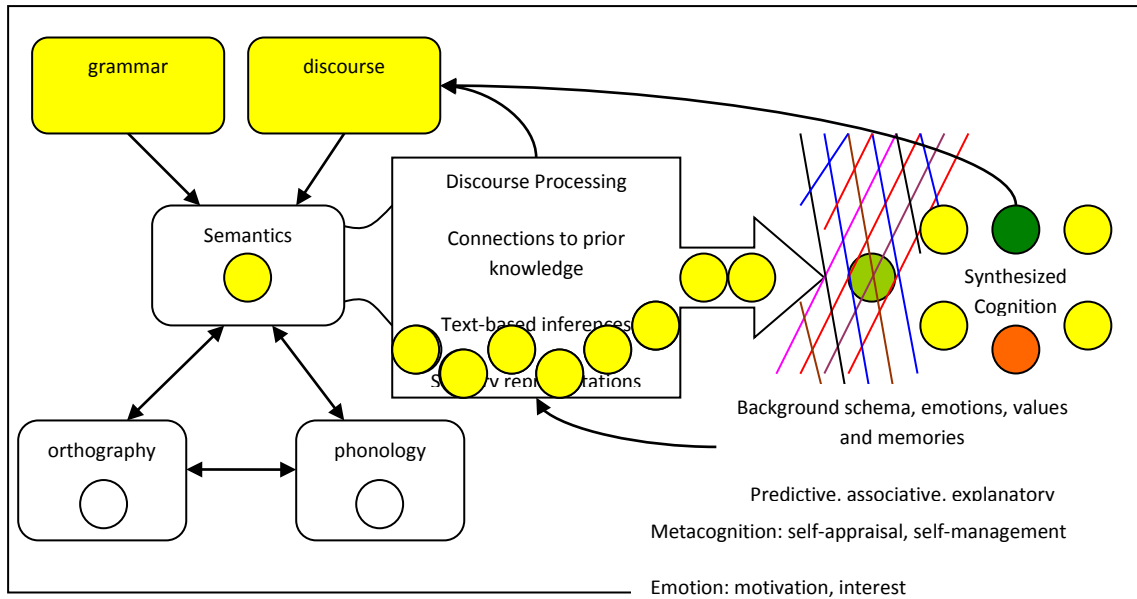


Figure 3. A Model of Meaningful Reading

discussion of the role of active, controlled, and constructive inferences in the acquisition of new information (Kintsch & Rawson, 2005). Inferences access background knowledge to fill in missing information with educated guesses, which are verified by the text. If a reader is very unfamiliar with a topic, she/he is lacking a detailed network of background knowledge. Inferences are necessary to tap into any speck of relevant pre-existing experience or information – a laborious process requiring conscious control (Kintsch & Rawson, 2005). Without this process, new knowledge will remain meaningless with no way of being evaluated or hooking into previous understandings (Kintsch & Rawson, 2005). Even if readers are familiar with the topic of a text, better readers have been shown to make a greater number of appropriate inferences (Cain & Oakhill, 1999).

Good readers use inferences to fill in meaning where it is missing. Readers tend to make inferences only as needed to achieve coherence because inferencing can be an effortful process

(Perfetti et al., 2005). Readers will exert mental effort until they judge themselves to understand the text, thus achieving a standard of coherence. A high standard of coherence influences readers to think more deeply about ideas in a text. Although all readers may lower their standards from time to time, Perfetti, et al. (2005) noted that more effective readers have a high standard of coherence as a default setting. Thus motivation and metacognition return as an important context for reading skills. A reader will exert more effort if she/he is motivated and able to effectively monitor her or his level of understanding to achieve a higher standard of coherence (Perfetti et al., 2005).

The Model of Meaningful Reading clearly shows the complexity of various cognitive processes working in coordination to produce higher level reading and thinking. Key components of the model such as background knowledge, inferencing, reading comprehension strategies, vocabulary and word reading, have shown a strong relationship with reading comprehension (Cromley & Azevedo, 2007). The model expands the general notions of decoding and oral language comprehension to more concrete and discreet skills that may be targeted to address specific skill deficits. Good readers use these processes proficiently to produce reading comprehension and to accordingly adjust thoughts and beliefs.

Conclusions

A Model of Meaningful Reading has been proposed as an amalgamation of existing reading theories. This model still provides a relatively straightforward understanding of reading that can be readily understood by the academic community, teachers, parents, and students. However, it is a more complete picture of those processes that occur while reading. It accounts for skills such as phonology, orthography, grammar, discourse, semantics, sensory representations, inferences, background knowledge, predictions, main ideas, metacognition, and

emotion. A Model of Meaningful Reading may more accurately depict the five areas the National Reading Panel has outlined as being essential for a balanced literacy program. This detailed understanding of reading is imperative when seeking to understand and, more importantly, remediate, the more obscure processes that are involved in reading. In the current environment when reading comprehension is gaining prominence both as a research and teaching area, an accurate model is necessary.

Implications for Teaching

This model suggests several important guidelines for school division specialists, special education teachers, and classroom teachers. When considering literacy within the classroom, teachers will want to choose a program that touches on the main components that are depicted in the model. Depending on the developmental stage of the students, teachers may choose to focus programming on different skills, keeping in mind that there is the possibility that weaknesses could still exist in earlier stages of skill development, even in older students. Inferencing has been shown to occur at multiple stages, and is key not only for a surface understanding of text, but also for a higher level, transformative understanding as well. Thus any balanced literacy program needs to incorporate this very basic and essential skill. Following a classic response to intervention (RTI) model, if these front line interventions are ineffective for some students, the Special Education Teacher and division specialists may also use the Model of Meaningful Reading to aid in more targeted, higher intensity interventions.

The Model of Meaningful Reading can offer the special education teacher a guide to intervention. First of all, it suggests that assessment is imperative to pinpoint which area requires intervention. Assessment can help to save time and resources by highlighting a specific skill to target for intervention. Furthermore, the model may offer a way to understand a pattern

of deficits if one of the more fundamental skills is found to be weak, thus permitting a quick and efficient way to help students in numerous skill areas. For example, a student who is weak in phonology, grammar, and semantics can gain the most benefit from an intervention in phonology, since this skill is a precursor to the other two (e.g., Catts, 2005b, 2005c). Once the phonology has been remediated, the student may make simultaneous gains in grammar and semantics, or these may occur as a result of greater practice and ease of reading. Conversely, the model offers teachers an opportunity to recognize the strengths of students who may be struggling, and use these strengths to build up weaknesses. For example, if a student is found to struggle in semantics, but is strong in sensory connections, a teacher could help a student to create sensory associations with particular words to enhance vocabulary knowledge. In this way, the model can guide the intervention process in a structured and efficient way.

Future Directions

A Model of Meaningful Reading is still a theoretical model that has yet to be proven with statistical data. In fact, much of the reading comprehension research is currently struggling with scientific validity. We do not have an intricate understanding of the precise mechanisms at work during comprehension. This model represents a starting point for such research. It offers researchers a more precise definition of the reading process so that instruction in higher level thought processes may be validated. The processes involved in reading comprehension still have to be further refined and broken down. In addition, the magnitude of relationships and sequential ordering of reading comprehension skills are still largely unknown (e.g., Kamhi & Catts, 2005; Kintsch & Rawson, 2005; Perfetti, Landi, & Oakhill, 2005; Snow & Juel, 2005). It is therefore difficult to say with any authority that one skill is more important, or more foundational, than

others. However, by providing a slightly more complex model of reading, focus may be shifted to these more advanced and mysterious aspects of reading.

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