SCHEMATA IN SECOND LANGUAGE READING

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Abstract

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Educators should become aware of ways to tap potential knowledge gained by learners who are already familiar with another language.   Reading has been called a passive activity but in fact involves the reader in much the same way as listening includes the hearer.   Eyes move forwards and backwards across a text depending upon comprehension and intent.   The reader controls his or her speed and relies on background knowledge and expectations to understand what the writer has written.   A student learning to read in a second language has the benefit of access to the patterns and information gathered by experience in first language use and from first cultural norms.   Language teachers should consider the different dimension added to the task of reading by students who have already developed a schema related to the topic in another language.   This study suggests that earlier ways of interaction with reading material are built upon connecting ideas from both languages to facilitate understanding.

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Introduction

Schema theory originated with studies of cognition and developed as computer scientists attempted to produce programs that mimic human processing. Understanding pragmatic relationships in language was thought as the key to successful computer models.   Schemata are the underlying connections that allow new experiences and information to be aligned with previous knowledge (McCarthy, 1991, p.168). Coherent relationships are required to make sense of text. The three types of schemata are content, formal, and abstract.   Content refers to clearly evident relationships obvious from a topic.   Formal are distant connections based on understanding of generalizations and mindset.   Abstract involve hidden factors and thematic considerations. They are all in any text and a reader's experience affects interpretation.

Not possessing the proper schema or being unable to activate it leads to inaccurate constructs. Readers may benefit from either being more prepared for a text or the text itself could be modified for easier comprehension (Carrell & Eisterhold, 1983, in Carrell, et al, 1998, p.85). It is debatable whether text modification helps in the long term or forces learners to use immature strategies for reading. Learners in classes influenced by research are more likely to become fluent if an appreciation for reading can be developed. Cultural sensitivity could be emphasized by having students read each other's compositions. Single topic or single author texts can be used to develop comprehension. Materials for class about local points of interest may overcome text interference problems. Sustained Silent Reading is another way to incorporate theory in class by allowing learners to choose their own book. The concept of schemata may help teachers better understand the process of reading by L2 learners.

Views on Schemata

A strong view of schemata sees them as something influencing the reader's opinion even before a text is read. Schemata are higher-level complex knowledge structures (van Dijk, 1981, p.141) that function as "ideational scaffolding" (Anderson, 1977). A weaker view of schemata would be one of organized background knowledge on a topic leading to predictions of discourse. Messages are seen in a certain way determined by a person's personal history, interests, gender, excreta (Anderson et al., 1977). As far back as 1932, Bartlett saw memory as constructive and mental representation was built from current discourse and background knowledge. Schema was an active feature organizing the pieces to develop memory. Schemata, whether fixed or flexible, are a way to account for interpretation and production of discourse (Brown and Yule, 1983, p.250)

Story schema proclaimed by Rumelhart (1977) and Thorndyke (1977) organize for readers the components a story is comprised of. Rumelhart illustrates the stages involved in a story (cause, desire, try, select, etc.), and Thorndyke has produced a set of rules for narrative discourse (setting, theme, plot, etc.). Readers employ their story schema for comprehension and storage of narratives. Brown and Yule (1983, p.120) recognize there is some merit to these observations, however, saying story schemas exist is not much more than saying stories adhere to expectations. The application of schema to narratives must become more enlightening and prove necessary for teachers to consider schema analysis alone worthwhile.

Origins of Schema Theory
Early Computer Models of Knowledge

Schank and Abelson (1977, p.10) see schemata as knowledge structures used for understanding what is read. Schema theory has been used in social psychology and was

active during the 1970s. The specific details, though, of an individual structure are not so easily discovered. Reality is understandable when specific instances conform to expectations even though there is an infinite amount of variation possible in content. Conceptual Dependency Theory is a theory of representation of the meaning of sentences. Words have been broken down into primitives. Schank and Abelson's (Ibid.) work was intended to enhance computer processing so that eventually natural language could be understood by machines. Developing Artificial Intelligence (AI) led these researchers to notice inherent ambiguities in language.

A script is specific schema comprised of a standard sequence of events. Script based understanding claims that "in order to understand what is going on a person must have been in that situation before" (Schank and Abelson 1977, p.67). Access to the mechanism that underlies scripts allows new situations to be dealt with. Plans (more general knowledge) are "the set of choices that a person has when he sets out to accomplish a goal" (Schank and Abelson Ibid. p.70). Plans depend on goals and goals can be determined from expected themes. Their inquiry was focused (to produce AI) but the examination of knowledge structures has revealed hidden elements of human behavior.

Types of Schemata
Vocabulary Recognition in Cloze Tests
Oller's (1995, p.276) definition of a schema as "the kind of organization that enables its user to handle certain kinds of tasks more efficiently than would otherwise be possible" explains Sasaki's data. Cloze tests examined by Sasaki (2000), measure higher processing abilities. This means that information beyond the sentence level is necessary to perform well. Schema theory was used to explain how higher-order processing is involved in taking cloze tests.

Schemata Classifications
The three classifications of schemata are content, formal and abstract. Content schemata are defined as being based on "abductive judgments about particular facts and states of affairs" (Oller Ibid. p.286, quoted in Sasaki 2000, p.87). Formal schemata seem to be developed from more distant connections of states of affairs that are somewhat similar. The third classification of abstract includes pure symbols and inductive integration. Abduction is recognizing a distinct representation; however induction is done if the recognition is more personal. The abstraction is an expansion of a single reference to act as a type through deduction.

The Conception of a Hotel

Sasaki's paper (2000) uses the concept of a hotel to demonstrate three possible schemata interpretations. 'Abstract knowledge' tells us it is a place rented to sleep the night at, whereas 'Formal knowledge' fills in additional information about the concept of hotels; having floors, an elevator, room numbers, keys, perhaps a bell hop, and 'Content knowledge' would be things like the specific name of the hotel, its actual location on a map, even the color of the carpet in our room.

Cognitive Considerations
Schema Criteria

Culture-specific knowledge is an earlier name for schemata (Carrell et al. 1998). Both top-down and bottom-up processing operates interactively. A schema as abstract knowledge structure leads researchers to question how connected to specific instances a schema is and what amount is abstracted. Parts of a schema can be called nodes, variables, or slots. Certain parts of a text activate the schema better than other words or phrases. The relationships in a schema are not interchangeable and vary in strength (Anderson & Pearson in Carrell et al. Ibid.).

Schema Overlap

A ship-christening schema, for example, includes champagne, a ship, a celebrity, etc. These parts have relationships in other schemas. Champagne might make someone think of a wedding before a ship christening but added to breaking the bottle suddenly, and "I do hereby…" will come to mind before "take this woman as my wife." A person's ship christening schema is what they know about ships being christened. This knowledge can be increased but any change has to come to terms with already possessed conceptions.

Fluency

Lennon (1989, p.388) has divided fluency into two key areas: speech- pause relationships and frequency of dysfluency markers. The broad sense of fluency is a person's spoken command of a language, whereas in the narrow sense is only an aspect of oral proficiency. Correctness is emphasized, the goal being "Native-like rapidity downplaying the content of speech. Lennon notices that written fluency is not valued and reading fluency is overlooked. Reading has long been bundled with listening as a passive skill. This paper attempts to contribute to amending this oversight, positing that a command of schemata is a necessary component of fluency. Spoken words vanish soon after they are said but speakers connect what comes next into the context of what was said already to form a coherent text. Reading mimics this process when a reader holds what was read in mind as his eyes fall on another

clue to what comes next.

Reading in General
The Basics of Learning to Read
What a child needs to learn how to read may not be the same as what a literate person does while reading. Goodman (1967) views reading as a process whereby a hypothesis is constructed based on the clues already sampled. Expectations about what is to appear next depend on semantic and sequential labeling strategies the reader uses to weigh the plausibility of an interpretation (Beaver 1970). Decoding a text occurs because of manipulation of syntactic clues perceived by the reader. Not all clues an author intended are noticed nor would processing be the same. Of course, a Reader does not have to possess the same attitude as an author to understand what is being said. Previous opinions interact with a text and influence the slant it is read with and processed. Reading a text is much like seeing a known place once again: Changes attract additional attention but eventually are included as known features. Reading is far cry from a passive activity!

Considering Strategies
Suppose expectations are not met, then strategies applied have to be rejected and a new strategy has to be deployed (Cowan 1976, p. 96). Perceptual strategies are "cognitive principles used in mapping external representations onto internal sequences to achieve comprehension" (Cowan Ibid. 1976, p. 105). The response to textual clues is shaped by cognitive routines. Cowan believes the structure of a reader's native language has to be considered as well as the target one. Forms encountered in the target language may not be equivalent to those of the source language. With these considerations in mind, perhaps it could be said that a reader has to adjust the earlier schema to one that is proper for the new language.

L2 Comprehension
Reading comprehension, as defined by Grabe (1991), is "a combination of identification and interpretation skills". More than just reinforcement of oral communication, fluent reading is done when new information interacts with previous knowledge. As important as previous schemata are, unknown vocabulary can leave a reader at a loss of what to do. Schema theory is popular in L2 reading research but first language researchers find the term less than ideal. It is held responsible for explaining reading ability but "cannot be explicitly defined" (Grabe Ibid. p. 384). In much the same way as other SLA research, schema theory is useful to draw comparisons between L1 and L2 development but is difficult to prove. Theory comprised of unfalsifyable hypothesizes is difficult to accept but useful in that it stimulates

research (Larsen-Freeman & Long, 1991, p. 249). Second language researchers use Schema theory as an explanation for methods of improving reading comprehension that work. Even though this does not prove the theory, it is still useful to be familiar with it.

Activation of Schema

Wallace (1992, p. 33) writes about the activation of Schemas and that they predict what will come next in spoken or written discourse as well as organize information. Jokes are an obvious example of a genre that requires cultural insight to appreciate. Different types of texts require readers to adjust their schema and shape constructs with their own experiences. So much beyond basic meaning is inferred from what is read.

The varying attitudes a reader has towards the topics encountered in text determine the effect reading has more than the author's intention. An author cannot anticipate exactly how an audience will be affected by his/her writing. Imagine Japanese students reading an American's account of Pearl Harbor compared to a Californian's reaction. Although, text can be interpreted in various ways unintended by the original author plenty of reactions are nonetheless assumed.

Comprehension may occur on different levels or in stages. Details and subtle hints to meaning could become unambiguous after the second reading of a text. An educator sharing his/her reactions informs learners but their initial interpretation is still possibility valid. Expectations may not be more of a requirement for comprehension than identifying words automatically but contributes to deeper understanding. Vocabulary can be included a part of a schema but every aspect does not have equal influence. Although, the researcher's need for clarity is not satisfied precisely, implications guide reading instruction with schema theory despite its weaknesses.

Monolingual Assumptions
L2 is the same but Different

Block (1992) advises caution applying L1 research to L2 readers. She sees reading as a hidden process and accepts an interaction of bottom-up and top-down processing. Her assessment of a good reader is one who uses meaning-based clues rather than over relies on word-level input to decode. Research was based on monitoring think aloud protocol as reading was being done. Block (Ibid. 335) concludes that a regular process operated for both native speakers and second language readers with differences occurring because of reading proficiency rather than other characteristics of the reader.

Reading Styles

Carrell (1998, p.101) calls schema theory a rubric of knowledge representation. Relying on bottom-up processing is considered text-boundness and means that a reader has limited his comprehension by not accessing, or not possessing, a formal or abstract schema. Schema interference would be on the other end of the scale whereby an expected form causes a reader to ignore or miss textual signals. ESL students can have either problem by considering information outside the text as irrelevant when they are reading in class or doing a test, or by misunderstanding a text because of different cultural norms. Reading to answer comprehension questions is somewhat different than reading to know more about a subject, so it may be an inherent problem with textbook style exercises. Grellet (1981, p. 9) suggests meaningful exercises, such as, answering a letter, using the text to do something, or comparing information to previous knowledge.

Implications of Schema Theory on Teaching

Approaching Text

Language teachers have approached material in such a way as to distort actual text by explaining all language features. Learners become accustomed to having everything explained and are at a loss when confronted with authentic ungraded texts. Reliance on word-level processing is reinforced in most language classrooms where vocabulary development is stressed rather than "building cognitive and metacognitive (monitoring) resources" (Block, 1992, p. 338). Teaching the meaning of specific words and phrases does not assist the student in deciphering a text as much as teaching that problems exist and that there are ways of solving them.

Far from offering a quick fix for problems arising due to a lack of reading comprehension, schema theory suggests that an extensive reading program is required. David Eskey (1986, p. 21) sums ups his theory in a motto: "People learn to read, and read better, by reading". Strategies may sound as if short cuts to proficiency are possible but actually they are only additions to a learner's repertoire. The development of good reading habits, more vocabulary structure, and encouraging factors come form extensive reading. Students can read in the classroom silently for pleasure or take material home to gain more from a book than what can be learnt from only concentrating on short passages.

Strategies & Activities

The theory supports such activities as, activating prior knowledge through pre-reading, strategy training, and developing 'automaticity' skills. Automaticity, in this case, means to be able to read without becoming stuck. Rapid reading, repeated reading, and extensive

reading and teaching structural aspects, all contribute to automaticity. The different meanings of words have to be interpreted and comprehended. Reading instruction should be content-centered, and in an integrated syllabus. Reading labs, sustained silent reading, complete lessons, skills and strategies, group work, and extensive reading are all factors in promoting fluency in reading.

Shared schemata and assumptions do not always match up from L1 to L2 (McDonough and Shaw, 1993, p. 109). Teaching reading strategies prepare readers for reading efficiently. Bottom-up strategies have the reader work from letters and minimum units upward to decipher text. Top-down strategies take into consideration the rhetoric of a passage activating knowledge of the subject as well as expectations and intuition. Teachers could have students utilize schema by having learners look at the title of a text and predict what follows. Reading for a purpose, especially interesting material, gives additional motivation to learners.

The Bigger Picture

Exact application will vary from class to class according the teacher's goals and the parameters of a course. L2 teachers have a tendency to get bogged down in vocabulary and translation matters, when in fact larger discourse items may be more helpful. L2 learners are often not able to say the word before reading it in printed material so rely on different strategies. Adult L2 learners have an already developed first language that can be utilized cognitively tapping previous expectations and experiences. Perhaps schema theory only seems to relate to L2 learners well because their pre-existing framework facilitates connections.

White (1981) suggests four stages of a reading lesson in a classroom: Arouse interest by linking the topic to learner experience, give points to search for, after-reading discussion, and use of new knowledge in writing. Another summary, by Beaumont (1983), addresses goals and objectives of a reading lesson. Text structure, text purpose, reading for information, and interpretation is a scheme for organizing class time. Some techniques include practicing skimming and scanning to reduce redundant reading, Information gap activities to link reading with other forms of communication, Text scrambling to promote awareness of cohesive features, and talking about reactions to tap background knowledge (McDonough and Shaw op.cit.1993, p. 114).

Modifying Text
Referencing

Chihara et al. (1989), supposes that minor changes (towards cultural conventions) in textual elements would result in better performance on cloze tests. They presume "the reader's main purpose is to discover or regenerate the meanings intended by the author" (Chihara et al. Ibid. p. 143). Interpretation is easier when experiences and expectations of the reader and writer are similar. Johnson (1981) and Floyd and Carrell (1987) refer to culturally determined expectancies as being of greater importance than syntactic complexity.

Reactions American or other English speakers have to a text "may not awaken" (Chihara et al. op. cit. 1989, p. 144) the same sort of expectancies in Japanese readers. They found that changing a few unfamiliar elements had a significant effect on results from modified and unchanged tests. Their inference is that additional cultural adjustments would produce greater results. This begs the question of whether texts should be adapted for certain audiences or does learning the target language include mastering connected cultural conventions?

The Case for Authentic Text

Reading can be thought of as "the construction of meaning from a printed or written message" (Day and Bamford, 1998, p. 12). Information has to become connected to previous knowledge for it retained. Knowledge consists of organized interrelated structures or schemata (Nagy and Herman, 1987, p. 28). By reading a great deal of different material for different purposes, a reader can "achieve the capacity for creating, refining, and connecting diverse arrays of cognitive schemata" (Grabe, 1986, p. 36). Simplifying texts seems appealing at first to facilitate easier reading but aspects of the original are lost in the process. Often a focus on the content of a text distracts from its true purpose: communicating with an audience (Day and Bamford, 1998, p. 58).

More is brought to the task of reading then the print on the page. Readers construct the meaning from the knowledge they have and react to the directions gleaned from clues seen in a text. Educators must be sensitive to difficulties cultural differences cause for learners. The text has to be made suitable for the reader, either by modifying the reading or by preparing the reader. Texts can be controlled by having students write it, read single topic or author, or by class time for sustained silent reading (Carrell, P., L., & J. C. Eisterhold, 1983, in Carrell, 1998, p. 86). Readers can be given background information and presented with

vocabulary to deal with unaltered texts.

Learner's Contribution

Readers themselves may be the best source for feedback. Teachers can check comprehension by asking their students open-ended questions, having them justify answers, or by collecting summaries. Celece-Murcia (1991) presents many approaches to analyzing text and developing understanding of the author's intent depending on the reading. She especially advocates pre- and post- reading discussions with children to allow them to realize schemata is brought to a text and becomes modified by it.

Inessential unknown vocabulary words disrupt comprehension unless the reader recognizes that they can be ignored. Strategy is an integral part of learning, more relevant than specific linguistic knowledge. How readers solve problems is a better focus than looking at what is problematic for them (Cohen et al. 1979). Language based and schema based problems for readers are dealt with in a variety of ways researchers are only beginning to be aware of. Learners who question and monitor what they read should realize it is a natural part of good reading not a weakness of their knowledge in the new language. Block, (Ibid.) suggests recognizing the source of the problem is the first step in applying a strategy and quotes Carrell (1989) as saying that the difficulty in the application of a strategy is when it is appropriate and why this is useful.

Conclusions

Perceptions of reality are restricted by the conventions used to record them. Meaning is decoded in a mysterious process that still is not fully understood. Work done on AI has led towards a new respect for human potential by developing models of how minds work. Software attempting to imitate top-down processing alone has not resulted in perfection, lending support to other ideas. The task of reading is accomplished through an interaction of top-down and bottom-up processing. A person's past knowledge allows text deconstruction but is simultaneously added to during the process by new information. Technology is evolving and models depicting the paradigm of gaining knowledge are being built upon (Ackley, 2001 in the Economist).

Becoming a fluent reader involves finding connections to one's own life and making new information part of one's own knowledge. The development of principled flexible skills that can be applied to different reading tasks is one of the most effective things from a reading class (McDonough and Shaw Ibid. p. 112). Learners as well as educators can better understand what messages are in a text by examining it with a number of approaches.

Schema theory offers insight on the way knowledge is constructed but is far from a complete unveiling of the mysterious process of reading.

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