

The Defects of Schema Theory: Pedagogic Priorities for EFL/ESL Reading

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Lee, Jong-Hee. 1998. *The Defects of Schema Theory: Pedagogic Priorities for EFL/ESL Reading*. *Linguistics*, 6-1, 371-388. Schema theory has been viewed as a notable foundation for current EFL/ESL reading strategies. The main purpose of this paper is, however, to subject the schema-theoretical approach to critical examination from the viewpoints of its intrinsic and extrinsic defects. The former is connected with the question of verifiability to be approved as a well-documented theory; and the latter is involved in the problem of generality to be recognized as a well-integrated approach to L1/L2 reading pedagogy. So in the light of such theoretical investigations, and more significantly, based on my standpoint that the prime requirement for both intensive and complete reading is the reader's macrolinguistic cognition capacity, I have established the framework of component skill-oriented priorities designed for successful EFL/ESL reading instruction. This methodology is anticipated to guide the reader to realize the essential deficiencies of schema theory and, eventually, to shed light on a possible way of constructing a more reliable approach to reading in a foreign/second language than such a controversial theory. (Kongju National University)

1. Introduction

Over the past three decades, research findings in foreign/second language reading have suggested a number of principles and practices applicable to EFL/ESL reading instruction. Particularly during the last fifteen years, among those outcomes, a schema-theoretical approach has elaborated the psycholinguistic model of reading, and it has contributed to improving L1/L2 comprehension strategies as well. Such an

approach has also been regarded as one of the significant modes that L2 learners may employ in reading (Anderson & Pearson 1984; Carrell 1983a; Carrell & Eisterhold 1983; Grabe 1991; Nelson 1987). So schema theory has provided a useful foundation for recognizing the role of the readers prior background knowledge in the process of interpretation.

In reviewing schema theory from the perspectives of reading pedagogy, I primarily aim to investigate its generic limitations and to demonstrate a general set of prioritized component skills for L2 comprehension in an effort to supplement those shortcomings. In doing this, I will first describe the notion of this theory and its key implications in association with the psycholinguistic process of reading, attempting to illustrate a few basic restraints that such a theory contains. Much attention will be given to the twofold flaws - intrinsic and extrinsic limitations - of the reading theory: one is on the question of verifiability to be accepted as a well-documented theory; and the other is on the problem of generality to be approved as a well-integrated approach to L1/L2 reading pedagogy. Finally, in the light of such theoretical considerations, and more importantly, based on my view that the process of intensive reading calls for 'macrolinguistic cognition capacity',¹ I would suggest a set of component skill-oriented priorities designed for successful EFL/ESL reading instruction.

1. In this paper, I intend to use the term 'macrolinguistic cognition capacity' in the description of reading process and its pedagogic requirements, of which the meaning involves a wide range of linguistic cognition ability and well-developed interpretation skills that the reader needs to demonstrate in order to perceive substantial amounts of linguistic meanings and other associated contexts reflected in the text, i.e., from deciphering a smallest unit of linguistic symbols (e.g., the meaning of every single word) to grasping the social functions of language in use (e.g., linguistic elements connoting social constraints embedded in the text).

2. The Implications of Schema Theory

In this discussion, as presented by many researchers, I will give a brief overview of the concept and essence of schemata/schema theory. The term schema, originally rooted in Bartlett's studies on human remembering, means the mental organization of an individual's past experiences (Aron 1986; Carrell & Eisterhold 1983; Cook 1992; Nelson 1987; Casanave 1988). The previously acquired knowledge structures, as Carrell and Eisterhold (1983:556) mention, are called schemata. The word schema is also described as a unit of knowledge and a data structure for representing the generic concepts stored in memory and from this notion we understand that language comprehension results when readers find a configuration of hypotheses (schemata) which offer a coherent account for the various aspects of the text (Rumelhart 1984 in Casanave 1988:284). And, the basic claim of schema theory - that is, a new experience is understood by comparison with a stereotypical version of a similar experience held in memory - is provided by Cook (1994:9). In addition Nunan (1995) introduces Minsky's similar view to this in the man's understanding new information: (. . .) human memory consists of sets of stereotypical situations (frames) which guide comprehension by providing a framework for making sense of new experiences (p. 67).

The results of research have suggested that, in a reader's processing of incoming data, two different categories of schemata - content schemata and formal schemata - can be independently and/or interactively recalled for the efficient comprehension of a text (Barnitz 1986; Carrell 1984, 1985, 1987; Carrell & Eisterhold 1983; Grabe 1991; Lee 1986; Matambo & Roller 1992; Nelson 1987). Carrell (1983b) gives the basic concepts of these elements as follows: One type of schema, or background knowledge, a reader brings to a text is a content schema, which is knowledge relative to the content domain of the text, and another type is a formal schema, or knowledge relative to the formal,

rhetorical organizational structures of different types of texts (p. 461). So it is natural that texts containing readers cultural norms, which provide familiar content for them, should be more easily comprehensible than those describing different and unfamiliar cultural backgrounds. Likewise, texts having familiar organizational features would be easier to comprehend than those having unfamiliar rhetorical structure. With regard to the relationship between content and form, Carrell concludes that when both content and rhetorical form are factors in L2 reading comprehension, content is generally more important than form, and each of these components plays a significant, but different, role in the comprehension of a text (1983b). In this connection, we need to note that rhetorical form is a significant factor, more important than content, in the comprehension of the top-level episodic structure of a text, event sequences and temporal relationships among events (*ibid.*:476).

On the basis of conceptual descriptions above, according to schema theory, reading comprehension is an interactive process between the readers background knowledge and the text (Barnitz 1986; Carrell 1984, 1985, 1987; Carrell & Eisterhold 1983; Grabe 1991; Lee 1986; Matambo & Roller 1992; Nelson 1987). The reading text, Carrell (1983a) states, does not carry meaning; it provides clues that enable readers to construct meaning from their existing knowledge, and it activates and builds on existing schemata. This implies that while reading, one makes assumptions, predictions and even reformulations about the incoming information in association with her/his prior background knowledge - schemata. In other words, a reader voluntarily negotiates for contextual meanings of the text (Widdowson 1990). With regard to the basic modes that the reader takes up in language comprehension, the schema-theoretic view, I think, is analogous to the psycholinguistic model of reading. As far as the difference between the two notions is concerned, however, I would like to point out that schema-theory emphasizes the role of the readers background knowledge, while the psycholinguistic process presents the general method adopted by the

reader in reconstructing the meaning of input data. In this psycholinguistic model, Goodman (1971 in Carrell & Eisterhold 1983) states that the reader reprocesses a message which has been encoded by a writer as a graphic display. As supporting Goodman's view, Grellet (1981 in Paran 1996) also notes that reading is an activity involving constant guesses that are later rejected or confirmed. Accordingly such a psycholinguistic model shows a top-down processing approach to the comprehension of a text, the implications of which are described with those of bottom-up processing mode below.

It has been suggested that on the side of the reader, there are two different modes of reading comprehension, called bottom-up and top-down processing (Barnitz 1986; Block 1992; Carrell & Eisterhold 1983; Grabe 1991; Matambo & Roller 1992; Nunan 1995). Along with these categories, researchers use the different terms which appear to be virtually equivalent in meaning to bottom-up and top-down models of language processing: textual and contextual approaches (Barnitz 1986), language-based and knowledge-based processes (Block 1992), data-driven and conceptually-driven modes (Carrell & Eisterhold 1983), lower-level identification and higher-level interpretation skills (Grabe 1991), and processing with systemic and schematic knowledge (Widdowson 1983). According to Nunan (1995), the central notion behind the bottom-up approach is that reading is basically a matter of decoding a series of written symbols into their aural equivalents (p. 64). In contrast with this method, the top-down approach emphasizes the reconstruction of contextual meaning from the text, and as readers control the reading process, they bring to the interactions between readers and texts their knowledge of the relevant topic, expectations about how language works, various attitudes towards the content of texts (ibid.). Both of these schemes are regarded as significant elements for effective reading comprehension. In this regard, researchers have stressed the importance that, to be fluent readers, the two modes should be activated simultaneously throughout the reading

process (Anderson & Pearson 1984; Carrell & Eisterhold 1983; Grabe 1991).

3. The Limitations of Schema Theory

As I have presented earlier, the schema-theoretic notion of reading has brought new insights and guidelines into the representation of language processing. Nevertheless, schema theory is considered to have a few generic - intrinsic and extrinsic - limitations to be confirmed as a well-established source for the manifestation of reading process and strategies. In order to examine such shortcomings, I would like to focus attention on the following passage:

According to schema theory, the process of interpretation is guided by the principle that every input is mapped against some existing schema and (. . .) This principle results in two basic modes of information processing, called bottom-up and top-down processing. Bottom-up processing is evoked by the incoming data; the features of the data enter the system through the best fitting, bottom-level schemata. Schemata are hierarchically organized, from most general at the top to most specific at the bottom. As these bottom-level schemata converge into higher-level, more general schemata, these too become activated. (. . .) Top-down processing, on the other hand, occurs as the system makes general predictions based on higher level, general schemata, and then searches the input for information to fit into these partially satisfied, higher order schemata (Carrell & Eisterhold 1983aa:557).

To sum up, the reading process is led by the principle which results in bottom-up and top-down processing, and these modes are worked out by hierarchically organized schemata consisting of specific and general ones. Here a couple of immediate questions arise: (a) how can we find out the structural feature of schemata?; and (b) how can we spell out the general validity of top-down processing? I want to begin

by looking at the first question. According to the passage above, schemata have a hierarchical structure and, more specifically, are arranged in the vertical order according to their particularities. In our lives we accumulate vast amounts of knowledge through direct and indirect experiences. From time to time we encounter various occasions to make ourselves activate our previously acquired knowledge. As we recognize the fact that we often call up only necessary parts and amounts of this knowledge on every occasion, we can imagine some particular ways in which such knowledge is organized and fixed to be readily recalled. Now we encounter a dilemma; that is, are we able to know exactly as to whether schemata are organized in a hierarchical form, and, if so, such a structural formation provides us with a sole basis of activating appropriate schemata on a specific occasion? Regretfully, in this respect we are not able to find out accurately what goes on in our brains. I want to draw on another statement in order to wrap up this discussion as below:

The past experience cannot be an accumulation of successive individuated events and experiences, it must be organised and made manageable - the past operates as an organised mass rather than as a group of elements each of which retains its specific character. What gives structure to that organised mass is the schema, which Bartlett did not propose as a form of arrangement, but as something which remained active and developing (Brown & Yule 1983:249).

It seems to me that the structural feature of schemata stems from Bartlett's original argument about the schema. Bartlett, as noted above, believed the organized form of a schema, but suggested that it did not have a specifically fixed pattern of arrangement. Although this notion of an organized mass is plausible, we do not have any empirical evidence about it. So the assumption that schemata are hierarchically organized is much more illusory than Bartlett's claim. This is, I would mention, the intrinsic limitation of schema theory. Then I would like to look at the

second question. In the modes of information processing, we can, rather clearly, figure out and acknowledge the practicality of a bottom-up approach to L1/L2 reading. According to this mode, we access to lexical semantics and sentential syntax on the basis of grammatical rules, gradually building up the composite meaning for the text.

However, what is the rationale of top-down processing? It seems to me that this processing mode is too vague to be defined as a well-developed model of interpretation. If I point out the basic concept of such a mode, it shows a way of comprehending a text in which we begin to construct the intended meaning of input information by operating our general schemata. In other words, the contextual meaning comes up out of the interplay between our schematic knowledge and the incoming data. So this indicates the critical role of schemata in reading comprehension. We again encounter another dilemma; that is, are we able to know exactly about how general schemata are stored in a specific way of being compatible with the content area of the text in top-down processing? Of course, we cannot be aware of it and, even more seriously, we may hesitate to believe it. At the same time we come to doubt as to whether such schematic information provides us with a crucial means of interpreting the text in both L1 and L2 reading? Presumably we can think of other variables which affect L1/L2 readers' textual or contextual interpretation.

With these questions in mind, I have found it meaningful to review the result of Carrells (1983b) empirical research in three components of background knowledge of both native (English) and non-native (ESL) readers. In this study, Carrell concludes that:

(. . .) unlike native speakers (. . .), nonnative readers show virtually no significant effects of background knowledge (Ibid.:183).

Carrell arrived at this conclusion by examining the individual and interactive effects of three components of background knowledge; (a)

prior knowledge in the content area of the text (familiar vs. novel); (b) prior knowledge that the text is about a particular content area (context vs. no context); and (c) degree to which the lexical items in the text reveal the content area (transparent vs. opaque).

Carrell further states that:

Nonnative speakers of English, reading in English, don't read like native speakers; (. . .) Neither advanced nor high-intermediate ESL readers appear to utilize context or textual clues. They are not efficient top-down processors, (. . .), nor are they efficient bottom-up processors, (. . .) (1983b:199).

According to Carrell (ibid.), the results of her study suggest that high-intermediate and even advanced ESL readers tend to be linguistically bound to a text, and they may understand the literal language of the text, but they do not make the necessary associations between the text and the appropriate background information. Further, it may be noted that even when they are provided with that relevant background information, they do not utilize such knowledge in reading comprehension. I do assume that these results are unexpected. In order to test Carrell's (ibid.) research findings, Lee (1986) has replicated her empirical designs and procedures with the exception that the subjects in his study wrote their recalls in their native language. In this test, Lee has also recognised the markedly different behaviours between native readers and nonnative readers in the process of reading.

However, refuting Carrell's extreme views on nonnative readers L2 processing, Lee (ibid.) points out the native language as the critical variable of process/product differentiation in reading comprehension (process)/assessment (product) task. He elaborates that assessing comprehension with the native language allows nonnative learners to more fully demonstrate their comprehension (ibid.:353). Moreover,

while the three components of background knowledge, Lee claims, affect the recalls of native speakers uniformly across the other components, the interaction of the three components of background knowledge, which is found extremely complex, affect the recalls of the nonnative readers (1986). From these two different viewpoints, we can assume that, in reading comprehension, the majority of L2 readers take cognitive processes quite different from native speakers. And we have realized that they essentially need a high degree of target language proficiency in order to activate their relevant background knowledge. Thus I feel secure in saying that the mode of top-down processing, in general, cannot be well suited to L2 learners. This is, I would remark, the extrinsic limitation of schema theory.

In line with all foregoing discussions, Grabe (1991) gives a widely held scepticism to the schema-theoretic view of reading: The notion that our long-term memory is organised by stable schema structures does not appear to be strongly supported by current research. While no one doubts the need to account for the role of prior knowledge and inference making in reading comprehension, many researchers question theories which cannot be explicitly defined (p. 384). Accordingly, it may be strongly argued that the reliability of schema theory is generically undermined by its intrinsic and extrinsic limitations mentioned above.

4. Pedagogic Priorities for EFL/ESL Reading

We have recognized the problem that the schema-theoretic approach to reading may not be effectively applied to EFL/ESL readers. This leads us to reconsider some pedagogic priorities for them and to find out other feasible alternatives in L2 reading pedagogy. Roughly we may imagine that a well-integrated scheme of reading instruction should be flexibly carried out to accommodate each L2 learners particular

circumstances. Taking due note of this, I would like to suggest a set of pedagogic priorities that L2 learners may follow in developing their reading abilities and strategies. The following components skills, which are prioritized with due consideration on L2 learners' target language deficiencies, are expected to help them to increase and demonstrate macrolinguistic cognition capacity in the process of reading:

- 1-1. Knowledge of Vocabulary and Grammar
- 1-2. Knowledge of Syntactic/Text Structure
- 1-3. Schema-theoretical Approaches
- 1-4. Metacognitive Processing/Comprehension Monitoring Skills
- 1-5. Critical Interpretation Skills

Now I would like to give a brief account to each component skills below.

1-1. Knowledge of Vocabulary and Grammar:

As I have already pointed out, unlike L1 readers, an L2 learner's sufficient target language proficiency is a prerequisite for the activation of relevant schematic knowledge in the process of reading comprehension. The majority of EFL/ESL readers, compared with native speakers, are in a **greatly disadvantageous** position to adopt schema-theoretical approaches **to reading**; it is mainly due to their inadequate L2 processing skills. In this context, Carrell and Eisterhold (1983) states that failures to **access** appropriate schemata are often interpreted solely as deficiencies in language processing skills (p. 562). In the process of second language reading, less-proficient L2 learners may continue to encounter **unfamiliar** lexical and grammatical features, and by these obstacles, **they** are expected to have considerable difficulties in understanding **syntactic** structures, which eventually prevents them from carrying out adequate semantic interpretations. So, in L2 reading pedagogy, a **knowledge** of vocabulary and grammatical rules must be given top priority, and both ESL teachers and learners

should recognize the prime importance of this basic component.

1-2. Knowledge of Syntactic/Text Structure:

After acquiring a well-established knowledge of L2 vocabulary and grammar, as a second step, L2 readers require a good understanding of sentential syntax and textual organization. More specifically, they should know well enough how words form a sentence, and how each sentence can be arranged and connected with one another within each paragraph, building up a complete text. And teachers must help them to learn a variety of rhetorical structures used in composition. There is, as Grabe (1991) states, considerable evidence that knowing how a text is organized influence the comprehension of the text. In this connection, according to Carrell (1984), the more tightly organised comparison, causation, and problem/solution types enhance the readers recall of specific ideas from a text than is the more loosely organised collection of descriptions (p. 464).

1-3. Schema-theoretical Approaches:

As has been noted earlier, the schema-theoretic view of reading indicates that, as reading is an interactive process between the reader and the text, meaning is constructed out of the interaction between a reader's activated background knowledge and what is in the text (Carrell 1983b). We also have recognized that L2 readers' target language deficiencies result in their inability to activate this prior knowledge in reading process. Nonetheless, their capacity to perceive symbolic meanings, often referred to as linguistic competence, does not automatically enable them to understand language in use including written texts. The reason for this, according to Widdowson (1990), is that the sign used in spoken or written language does not function as a symbol but as an index: it indicates where we must look in the world we know or can perceive in order to discover meaning (p. 102).

Thus teachers must emphasize that L2 readers should acquire not

only a high degree of L2 processing skills, including structural knowledge, but they also need to possess schematic knowledge as an essential source of references about the world. From this point of view, I assume that what makes it more difficult to instruct this schema-theoretical approach lies in cognitive discrepancies arising out of prior knowledge possessed by each L2 learner. The prior background knowledge that they bring to the text is often said to be culture-specific (Barnitz 1986; Carrell 1984, 1985, 1987; Carrell & Eisterhold 1983; Matambo & Roller 1992; Nelson 1987). Given this general tendency, they are initially required to possess a great deal of factual knowledge about the target language community, which is expected to reduce their socio-cultural gaps in reading comprehension. As Carrell and Eisterhold (1983) also suggest, second language teachers can, of course, guide L2 readers to better understand culturally-biased texts by providing them with relevant detailed information.

So, in terms of curriculum planning and instruction practices, it is important to select appropriate text materials used for L2 reading comprehension. I imagine that teachers may be able to instruct and control the variable effects of L2 learners' interpretation with the texts covering culture-biased and/or culture-unbiased content areas. And it is my view that text materials, describing an area of scientific content can be used as culturally-unbiased ones, given the scientific text, in most cases, deals with the man's universal knowledge of the world, and do not bring about cross-cultural mismatches between the reader and the text. On the part of the writer, Brookes and Grundy (1990) presents a general viewpoint to support this:

We find quite a widely held view in the literature that scientists have a common body of knowledge and ways of looking at the world and that the main task of a writer from another culture writing in English is virtually that they need do no more than translate directly from one language into another (p. 34).

1-4. Metacognitive Processing/Comprehension Monitoring Skills:

Recent research in L1/L2 reading places emphasis on metacognitive knowledge and comprehension monitoring skills (Block 1992; Carrell 1989; Casanave 1988; Grabe 1991). On the part of L2 teachers and students, these are regarded as practical approaches to second language reading. Metacognition, as noted by Block (1992), involves thinking about what one is doing while reading. Similarly, Grabe (1991) states that metacognitive knowledge, as knowledge about cognition, including knowledge about language, involves understanding forms of structure and organization, and employing strategies suitable to achieve specific goals. In addition, well-developed metacognitive skills are elaborated by Baker and Brown (1984 in Casanave 1988) in the following statement:

- (a) clarifying the purpose of reading, that is, understanding both the explicit and implicit task demands;
- (b) identifying the important aspects of a message;
- (c) focusing attention on the major content rather than trivia;
- (d) monitoring ongoing activities to determine whether comprehension is occurring;
- (e) engaging in self-questioning to determine whether goals are being achieved; and
- (f) taking corrective action when failures in comprehension are detected (p. 288).

Comprehension monitoring, then, is a kind of activity under the general heading of metacognition. This monitoring mode requires the ability to evaluate one's current level of understanding, to plan how to remedy a comprehension problem, and to regulate comprehension and fix-up strategies (Paris & Myers 1981 in Casanave 1988:288). Fluent L2 readers are expected to automatically manipulate comprehension monitoring skills and fill in or repair much gaps in what they read in spite of their inadequate schematic knowledge. So I believe that more-proficient EFL/ESL readers can fit into this metacognitive awareness and comprehension monitoring mode. Teachers are advised to take note of this.

1-5. Critical Interpretation Skills:

Fluent L2 readers at a satisfactory level of all component skills above, as a final step, may be recommended to learn 'critical interpretation skills'.²⁾ In a reader's individual stance to the text, we can draw a basic distinction between viewing a reader either as submitting to the text or as asserting himself over the text (Widdowson 1984). The former - a submissive stance - indicates, Widdowson mentions, a reader's position in which he intends to adapt his own conceptual references to accommodate the writer, whereas the latter - an assertive stance - means a reader's position in which he attempts to disapprove the general intentions of the writer and to project his own factual knowledge into the text. Although this dichotomic view is not necessarily true of every reader, less-proficient L2 learners in the target language, I think, tend to take up a submissive position in the process of interpretation. In this regard, according to Widdowson (ibid.), if the reader is too assertive, there is a danger that he may distort the writer's intentions and deny access to new knowledge and experience. If he is too submissive, he runs the risk of accumulating information without adequately incorporating it into the schematic structure of existing knowledge (p. 226). He implies the reader's need to avoid both of two extreme positions. I would agree, in a narrow sense, to this view. But I desire to emphasize EFL/ESL teachers roles and responsibilities for enhancing students' awareness with regard to critical language interpretation, which should be one of the ultimate goals of L2 reading. I would refer to this aim as the development of macrolinguistic cognition capacity, taking into account the essence of reading process.

For this reason, advanced L2 learners should be given ample opportunities to enhance macrolinguistic cognition capacity through the training of critical interpretation and, thereby, to expand their schematic

2. In this discussion, I use the term 'critical interpretation skills' in a narrower sense than critical discourse analysis; e.g., this term does not cover aspects of spoken interaction.

horizons regarding the social functions of language in use. They should learn the relationship between the text and its social contexts. As social norms and ideologies are embedded in the text, teachers need to look upon second language comprehension as cross-social/cultural cognitions in relation to reading pedagogy. In a similar context to this, Wallace (1992) claims that effective reading involves challenging the ideological assumptions as well as propositional knowledge in written texts and teachers may need to guide readers to an awareness of ideological content (p. 61). Thus, I believe that L2 learners would not be able to become competent readers without critical interpretation skills which may provide a prime foundation for the strengthening of macrolinguistic cognition capacity. All prioritized component skills discussed above are expected to play crucial roles in both EFL/ESL reading comprehension and pedagogy. With this anticipation in mind, each unit of component skills needs to be appropriately selected and applied to each L2 reader in consideration of her/his individual circumstances, particularly linguistic and cultural variables.

5. Conclusion

In respect of intensive reading pedagogy, EFL/ESL learners, I believe, require a wide range of linguistic competence and its associated skills - macrolinguistic cognition capacity - which covers the critical interpretation of written discourse. Given this necessity, the process of L2 comprehension, as an invisible cognitive activity, would be far more complicated than that of L1 processing. So we are not able to recognize exactly what cognitive elements of L2 learners are involved and demanded in their interpretation of the text. Coupled with this complexity, L2 readers' personal and social factors would make it more difficult for us to draw up a well-integrated scheme of reading pedagogy. In addition, the schema-theoretic view of reading, as discussed earlier, has its intrinsic and extrinsic limitations, which impair

this theory's validity and its scope of application, particularly to L2 learners. These constraints also show that such a theory gives only a partial hypothesis to such a complex interactive process between the L2 reader and the text. With due weight on all these factors, I have suggested a general set of pedagogical priorities for L2 learners reading comprehension. Of course, the proposed component skill-oriented approach is not complete, given L2 readers' linguistic, cultural and other relevant variables. Consequently, future research in this field must be aimed at developing a more well-established model of L2 reading process and pedagogy, which is, I do hope, able to overcome or supplement the fundamental defects of schema theory.

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