

SCHEMA THEORY AND L2 READING INSTRUCTION

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INTRODUCTION

There is a general consensus now over the crucial role that background knowledge plays in both L1 and L2 reading comprehension. Empirical research—much of which has taken place in the context of “schema theory”—has demonstrated that the comprehension of a text is significantly affected by the reader's relevant background knowledge of the content area of the text.

Acknowledging the importance of background knowledge should not be seen, however, as an attempt to minimise the importance of language competence in L2 reading comprehension. In fact, research findings indicate that insufficient proficiency may severely limit the ability to read in that language (Clarke, 1980; Hudson, 1982; Carrell, 1983b).

However, insights into the reading process that can be gained by considering recent research into prior knowledge, together with the potential implications for teaching render the nature and relevance of such knowledge worth examining.

The purpose of the following article is threefold. First, I will briefly overview “schema theory” and how it can explain how people's existing knowledge affects comprehension. Secondly, how background knowledge has been reported to influence reading comprehension and the implications for teaching that can be derived from that analysis will be examined. Finally, the two major responses to schema theory in L2 reading instruction, namely the use of pre-reading activities and the confining of reading to a single topic area will be discussed.

Most of our current perspectives of L2 reading are based on earlier research on L1 learners. Since some of its conclusions can be profitably exploited by foreign language teachers, references will be made to it throughout our discussion.

SCHEMA THEORY

Schema theory explains how comprehension is affected by people's existing knowledge (e.g. Rumelhart, 1980). According to this theory, understanding a text is an interactive process between the text itself and the reader's acquired background knowledge, which is organized in abstract structures or “schemata”.

Within the schema-theoretic framework, the process of interpretation is guided by the principle that all new information is sampled against some existing schema. During that process modifications are made to incorporate information not previously accounted for into the

structure of prior knowledge. This principle results in two modes of processing known as bottom-up (or text-based) and top-down (or knowledge-based) processing.

Provided that the incoming input that is recognized through bottom-up processing and the conceptual predictions that made through top-down processing are compatible, readers are said to have understood the text. In case of a mismatch, the reader is forced to revise the interpretation in such a way as to make the two compatible once again.

Comprehension is, consequently, a matter of activating, re-elaborating or constructing a schema that provides a coherent explanation of the relations between the objects and events mentioned in a discourse. Schemata are, thus, necessary for comprehension. However, it must be taken into account that not every reader approaches a text with the same background or schemata so that one person's interpretation of a text may differ from another's. The study carried out by Anderson et al. (1977) investigating the effect of academic specialization on the understanding of two ambiguous texts clearly illustrates this point.

But the important issue for our discussion is the emphasis on the reader's creative, active role in extracting meaning out of a text and how understanding is a function of the particular schema that is activated at the time of reading.

A schema-theoretic interpretation of L2 reading comprehension: two controversial issues

An interpretation of L2 reading comprehension in terms of schema theory leads us to consider two controversial issues: i) the role of language competence and how it relates to background knowledge, and ii) the extent to which differing interpretations of a text can be accepted as equally correct comprehensions of it.

i) Language competence and background knowledge

The study into the relationship between general language competence and L2 proficiency has motivated some researchers to suggest that there is a threshold of linguistic competence necessary for successful L2 reading comprehension to take place. (Clarke, 1980; Hudson, 1982; Cummins, 1979). However, the facts that a) it can be partly overridden by induced schemata (Hudson, 1982; Brandford et al., 1984; Stein et al., 1984, reported in Brandford et al., 1984) and b) the more difficult the reading task, the higher the linguistic knowledge is likely to be necessary (Alderson, 1984) indicate that the linguistic ceiling cannot be equated with a fixed proficiency, but rather with a relative one. Although the target for readers is to reach a stage of automatic language processing, the linguistic knowledge of the type that forms the "threshold" must therefore interact with other "strands" of knowledge, that is, background knowledge assumptions and relevant formal and content schemata. Linguistic proficiency is, therefore necessary, but not, by itself, sufficient for successful L2 reading. Stanovich's (1980) "interactive compensatory model" of reading, according to which a reader who is weak in one strategy will rely on other processes to compensate for the weaker ones lends support to this claim.

ii) Do texts have an inherently "correct" meaning ?

We have already considered how comprehension is affected through the text being related to the particular knowledge structures of a reader. A debate has been opened by reading specialists over the issue of whether the text is to be considered as having an inherently “correct” meaning, or whether any interpretation arrived at by an individual reader is to be regarded as “correct” (e.g. Alderson and Urquhart, 1984; Williams, 1986; Urquhart, 1987).

On the one hand, it has been argued that although the reader's reconstruction can never be a mirror image of the writer's intentions (Williams, 1983), the writer's role in the communication process is indeed endangered and devalued if we were to deny that misunderstandings of a text can occur. Furthermore, this perspective leads to seriously question the value of improving reading through instruction (Williams, 1986).

A different view is adopted by Alderson and Urquhart (1984) and Urquhart (1987), who insist on the prevalence of the comprehender's position over the writer in written communication. However clearly the author's message is stated in a text, it is always up to the reader to adopt what Widdowson (1984) has called a dominant or submissive attitude. Hence, the reader's recognition or not of the writer's original intention ultimately depends on what type of comprehension he or she seeks to obtain (Urquhart 1987).

An informed teacher must be aware of these two alternative ways of conceptualizing reading comprehension and what they each imply. The position adopted over this issue will undoubtedly affect the teacher's classroom approach to reading with regard to the choice of activities, text materials, strategies to focus on, assessment and so on.

However, this issue, rather than viewing it as a matter of taking sides with one of the two extreme positions, could be more appropriately considered—from a pedagogical perspective—in terms of teachers adopting different attitudes according to the nature of the text in question. For language teaching, I find Eco's (1981) distinction between “closed” texts, i.e. texts that intend to bring about a precise response (e.g. a set of instructions) and “open” texts, i.e. texts which may not have such purpose, (e.g. a novel) particularly illuminative and useful.

FORMAL SCHEMATA AND CONTENT SCHEMATA

With respect to reading, there are two types of prior knowledge that have concerned researchers in recent times: knowledge of text structure or formal schemata and knowledge of text content or content schemata. The former refers to the background knowledge about “*the formal, rhetorical, organizational structures of different kinds of texts*” (Carrell, 1983a:461). The latter concerns the knowledge of the content area of a text.

Formal schemata

A number of L1 research studies have provided empirical evidence that the rhetorical organization of a text interacts with the reader's formal schemata to affect reading comprehension. This effect has been proved to be operative for both narrative (e.g. Rumelhart, 1977; Mandler and Johnson 1977) and expository texts (e.g. Meyer & Rice, 1982).

In the field of L2, Carrell's (1981 reported in Carrell 1983a) research demonstrates that when the content of a story is kept constant, but the rhetorical structure varies, L2 comprehension, like L1 comprehension, is affected. Furthermore, writers on contrastive rhetoric such as Kachru (1983) and Kaplan (1966, 1976) have indicated the need to raise the learner's awareness of the rhetorical conventions of the target language. The evidence so far suggests that there are culture-specific thought patterns determining the structure of expository texts.

These findings have led specialists to emphasize that L2 reading teachers should instruct students to recognize and use the information provided by the form of a text, this being defined in discourse terms. The reason that underlies this claim is that once learners recognize the pattern that is being used, they can apply their reading strategies to follow the text and predict what is likely to follow.

The pedagogical response to the recognition of the relevance of the formal features of a text has so far focused on two main areas:

- genre and structure (narrative, expository, etc.) (e.g. Grellet, 1981; McArthur, 1984)
- discourse functions (definition, description, analogy and contrast, clarification, argumentative and logical organization, etc.) (e.g. Widdowson, 1979)

Content schemata

The two main areas of research into content knowledge have been knowledge of a specific culture or subculture and knowledge of a specific subject, domain and/or discipline.

i) Culture-specific knowledge

Culture-specific knowledge comprises the shared knowledge and assumptions held by the target language community regarding not only places, events and institutions, but also attitudes, beliefs and social conventions. Research has quite conclusively established that prior knowledge of the culture-specific information presupposed by a text affects the way the text is understood (e.g. Steffensen et al., 1979; Steffensen and Joag-Dev, 1984). A source of misunderstandings in reading, therefore, can derive from the fact that the cultural assumptions implied in the text may not be a part of the reader's schemata.

An investigation carried out by Gatbonton and Tucker (1971) demonstrated that EFL students drew incorrect assumptions when reading unfamiliar texts due to cultural misunderstandings. Similar conclusions have been arrived at by further investigations into this field (e.g. Johnson, 1981; Carrell, 1981 in Carrell, 1984a).

Although some authors have expressed doubts as to the value and even the feasibility to teach cultural information (e.g. Alderson and Urquhart, 1984), here are some of the activities that have been suggested to provide the means by which schemata related to the target language culture can be built up and developed and/or minimize the effects of culturally related topics in texts.

i.1) incorporate materials related to the learners' native cultural background and local settings (local newspapers, pamphlets, brochures and booklets about local places of interest,

etc.) (e.g. Paulston and Bruder, 1976; Carrell and Eisterhold, 1983; Elley, 1984; Tudor, 1990). In the earlier stages of reading instruction these materials, due to their conceptual proximity to the learners, can be of great value in helping them to progress to more demanding ones, also in terms of linguistic and rhetorical levels.

i.2) introduce literature into the reading programme as a means of fostering cross-cultural empathy (e.g. Rivers, 1968; Marquardt, 1967, 1969). However, Yousef's (1968, reported in Steffensen & Joag-Dev, 1984)) report of the failure of a programme where literature was specifically used as a vehicle to teach culture raises doubts as to the effectiveness of such method.

i.3) provide explanations of key and/or high-frequency, culturally-loaded terms (e.g. Rivers and Temperley, 1978; Carrell and Eisterhold, 1983).

i.4) support reading with visual material (e.g. Rivers and Temperley, 1978; Robinett, 1978).

i.5) exploit the teacher's own experiences in the target language culture (e.g. Robinett, 1978).

i.6) raise awareness of cultural differences by contrasting events which are problematic for learners to understand to formally or functionally similar ones in their native culture (Steffensen & Joag-Dev, 1984:61).

i.7) text developers should work alongside writers with detailed (or native) knowledge of the students' culture and ethnic reviewers "to screen out potential misunderstandings" (Steffensen and Joan-Dev, 1984:61)

ii) Subject knowledge

Absence of content schemata may also occur independently of culture specificity. People belonging to the same culture group may differ greatly in their background knowledge in certain content areas.

In the L2 context, research into the effects of the academic background of an individual on reading comprehension has been frequently related to testing issues. Studies by Erickson and Molloy (1983) and Alderson and Urquhart (1983, 1985a and b) have provided quite convincing evidence of an interaction between test takers' familiarity with content area and performance in reading comprehension.

Background knowledge and testing

The appreciation of potential sources of bias in language tests is essential to both their development and use. One of the issues most frequently mentioned in discussions of test bias refers to the problem of clearly distinguishing elements of cultural and educational background from the language abilities that are to be measured (Condon, 1975; Chen and Henning, 1985; Zeidner, 1987; Duran 1988).

This issue has received extensive attention in the field of Languages for Specific Purposes (LSP). With reference to this discussion, Bachman (1990) has rightly pointed out that if we develop a LSP reading test on the assumption that specialized knowledge is part

of the language ability, the scores from this test cannot be necessarily interpreted as indicators of generalized language ability.

Attention has been also drawn to the fact that test writers do not belong to the academic culture of the test takers. The evidence provided by Zuck and Zuck (1984 reported in Urquhart, 1987) in the sense that content specialists approach texts in their fields in a recognisably different way from language teachers leads one to conclude that the validity of LSP tests cannot be guaranteed unless content specialists are involved in their construction (Urquhart, 1987).

The recognition of the relevance of background knowledge has raised increasing doubts as to the existence of texts which are “neutral” across a wide range of readers (Alderson and Urquhart, 1985). However, the following three recommendations have been put forward to minimise its effects on measurements of reading performance:

i) testing should be limited to the information linguistically “committed” to the text. The testing of inferential information should be looked at with suspicion since “*different inferences may be equally successful for making the text meaningful for particular readers*” (Urquhart 1987:406).

ii) the use of general comprehension tests to predict performance in specialized areas may not be adequate (Alderson and Urquhart, 1985; Bachman, 1990).

iii) “tasks” could be used as alternatives to answering comprehension questions. Urquhart (1987), drawing on Nuttall (1982) emphasizes the advantages of using these “communicative tasks” to assess the testee's ability to handle language in real context.

RESPONSES TO SCHEMA THEORY IN L2 READING INSTRUCTION

As far as L2 reading instruction is concerned, pre-reading activities and “narrow reading” can be regarded as the two major responses to schema theory.

Pre-reading activities

The use of appropriate pre-reading techniques -widely regarded as a crucial element in fostering an active and productive use of learners' background knowledge- has now become common practice in L2 reading lessons (Williams, 1984; Williams and Moran, 1989; Tudor, 1989).

These preparatory activities serve three main purposes, namely i) activate learners' relevant knowledge, ii) build up that knowledge and iii) serve as a conceptual guidance in the reading of the text.

Within the scope of pre-reading, a wide range of quite distinct activities can be identified. (Tudor's (1989) categorization of pre-reading formats gives quite a complete account of these activities as found in a corpus of ELT materials).

The following are some activity-types that have been suggested and/or used in published materials:

— use of visuals (pictures, slides, movies, charts, tables, etc.) (Nuttall, 1982; Grellet, 1981; Carrell, 1988).

— key-word/key-concept association activities, in order to yield a diagnosis of what students already know about a key concept (Hudson, 1982; Carrell, 1988)

— information-seeking questions; a reading purpose is thus provided to the reader (Grellet, 1981; Hutchinson and Waters, 1984; Widdowson, 1980)

— background information provision (Kitto and West, 1984; Carrell, 1988; Land, 1986)

A final comment on the use and development of pre-reading. An indiscriminate use of these activities will not guarantee, by itself, that the learners be optimally geared towards the reading activity. The planning and selection of these activities should include a careful analysis and assessment in the light of these three factors:

i) the learners's needs, characteristics and conceptual preparedness,

ii) the aims of the reading instruction and what the teacher sets to derive from a given text, and

iii) the conceptual and rhetorical demands that the text places on the reader.

Narrow reading

Krashen (1981) suggests “narrow reading”, that is, reading confined to a single topic or to a single author, as highly efficient for L2 acquisition (1981:23). In schema theory terms, this means that schemata are repeatedly accessed and further expanded and refined, resulting in an increase of comprehension.

The benefits of a content-centred approach are also discussed by Eskey and Grabe (1988); ESP courses for academic or occupational groups are examples of this approach. The same idea is implicit in Nunan (1985) when he proposes that, in contexts where English is the medium of instruction, the teaching of the language should not be divorced from the teaching of the various subjects within the school curriculum.

All the suggestions above can be seen as attempts to provide what Grabe (1986) has called a “critical mass” of information, that in turn provides a natural opportunity to read into that subject extensively.

SCHEMA THEORY AND MOTIVATION

A further aspect that must not be forgotten when discussing background knowledge in reading refers to the motivational factor. A widespread belief among L2 professionals claims that the subject matter should be both interesting and relevant. This argument is, in my view, especially appropriate to reading.

If one of our aims in the design of L2 reading programmes is that students should acquire reading skills, we should find materials that the students will be interested in rea-

ding. This, in turn, demands the consideration of a certain degree of individualization. The underlying idea is that readers tend to be naturally inclined to read texts that are relevant to their own experiences. They are, in that way, providing their own appropriate background knowledge for understanding the text.

CONCLUSION

In this article I have tried to analyze how reading comprehension is mediated by an individual's prior knowledge and the implications that such influence has for L2 reading instruction. In this sense, schema theory forces us to reconsider the traditional view on reading comprehension and its almost exclusive emphasis on the language to be understood.

In order to develop and select materials, an informed teacher must be aware of the ways in which different "strands" of knowledge interact during the reading comprehension process in order to adequately respond to the learners' problems when approaching a written text.

From the discussion above, assessment of reading materials in terms of the suitability of the conceptual, cultural and rhetorical preparedness of the learners together with a consideration of the frames of references assumed by the writer seem to be crucial steps in the evaluation of any reading activity and/or programme.

A final but extremely important issue must be mentioned in relation to this discussion. The essential point is, as Tudor (1989) rightly points out, "*not to view background knowledge solely in deficit terms -as something which the learners do not possess*" (p. 324). Following a constructivist view of learning, it is the students' already acquired knowledge—whatever this may be—that we should exploit in order to facilitate their interaction with L2 materials.

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