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What is This?
TOWARD UNDERSTANDING THE EFFECTS OF CROSS-CULTURAL SCHEMATA AND DISCOURSE STRUCTURE ON SECOND LANGUAGE READING COMPREHENSION

John G. Barnitz
University of New Orleans, Department of Curriculum and Instruction, New Orleans, LA 70148

ABSTRACT

Research on second culture and second language reading comprehension is reviewed to support the claim that second language reading is an interactive process, involving the interrelationship of cultural schemata and discourse structure. Studies on content schemata include investigations of the roles of cultural knowledge and second language proficiency in comprehension. Studies on discourse processing include linguistic descriptions of ethno-linguistic discourse patterns (contrastive rhetoric), as well as psycholinguistic comprehension studies on expository prose, story structure, and cohesion. This multidisciplinary review functions as an argument for the roles of cultural schemata and discourse structure in an interactive model of first and second language reading.

It is a well-documented fact that native language reading comprehension involves the role of knowledge of the world and knowledge of native text structure (Langer & Smith-Burke, 1982; Spiro, Bruce, & Brewer, 1980). Reading is a complex interactive, hypothesis-generating psycholinguistic process which is tied intimately to the reader's language proficiency. While there are basic similarities in the fluent reading process in various languages (see Goodman & Goodman, 1978; Hudelson, 1981), it is natural to expect that nonnative language proficiency or language differences may influence reading and learning.
to read a second language. Likewise, specific linguistic and cultural differences can affect learning to read, especially because differences exist in orthographies (Barnitz, 1982; Kavanagh & Venezky, 1980; Taylor & Taylor, 1983), morphology (Greene, 1981), syntax (Cowan, 1976), and discourse (Carrell, 1984b; Kaplan, 1983). At present, a body of literature continues to accumulate that documents the role of cultural and cross-cultural content and discourse schemata on the reading comprehension of first and second language learners. While much research is conducted on first language reading, a need exists for investigation of the effects of cultural and linguistic differences of schemata and text structure on the reading comprehension of second language learners. Cross-cultural comprehension research can contribute to our understanding of the reading process in a first and second language.

This research review integrates the rapidly growing multidisciplinary body of literature on the effects of cross-cultural “content schemata” and “formal schemata” (Carrell, 1983b) on second language and second culture reading comprehension. Research trends receive the primary focus. For discussions of instructional practices in teaching reading comprehension to culturally and linguistically variant children, see Andersson and Barnitz (1984), Barnitz (1985), Carrell (1983a, 1984c), Carrell and Eisterhold (1983), and Joag-Dev and Steffensen (1980). This review functions as an argument to support the roles of cultural and linguistic variables in models of reading.

Before proceeding with the main discussions of literature, it is important to present briefly some research on second language reading in order to provide a useful context for understanding more specific aspects of cultural discourse comprehension. Research is available which documents some characteristics of second language reading.

Goodman and Goodman (1978), using the oral reading miscue paradigm with story retellings, examined the reading performance of children from several language backgrounds. While language differences were found to influence oral reading performance, the children demonstrated proficiency in using such universal reading strategies as selecting, sampling, confirming, rejecting, predicting, and correcting. Similar research by Flores (1982) and several studies reported in Hudelson (1981, 1984) also support the view that language differences, although influential when learning to read a second language (L2), do not necessarily limit reading performance. Second language proficiency can even be enhanced through the reading process.

In contrast, additional oral reading research by Cziko (1980) suggests that a reader's competence in a second language affects the reading strategies used to read it. Cziko found that junior high native and advanced readers of French as a second language were able to interact with text, using bottom-up and top-down processing, relying on graphic as well as contextual information in reading, while less proficient readers of the second language used more
bottom-up strategies. Likewise, Perkins (1983), using tasks similar to those used by Blachowicz (1977–1978), found that university students in ESL classes were able to use semantic constructivity, but that their construction of meaning may be “marred” by such things as language interference or the reader’s developing English language competence. Clarke (1979) calls this the “short-circuit” hypothesis: language proficiency in a second language places a ceiling on reading performance.

In a comparative study of native and nonnative English readers at the university level, Carrell (1983c) concluded that native and nonnative speakers do not process English prose alike. Nonnative speakers of English do not appear to use context (top-down) or textual (bottom-up) clues efficiently when reading English, the second language. Nevertheless, Hudson (1982) indicates that existing prior knowledge or induced schemata can override the short-circuiting effect of limited second language proficiency. Thus, there appears to be an interactive relationship of language proficiency and schemata in second language comprehension, even though reading is similar across various languages (Hudelson, 1981). The role of first and second language proficiency effects on bottom-up and top-down cognitive processes needs a substantial amount of further exploratory research in naturalistic and experimental settings.

The major components of this paper address the roles of content schemata and formal schemata on reading comprehension. As illustrated in the structured overview in Figure 1, the first set of studies are based primarily on the research paradigms in schema theory; the second set of studies are based on linguistic and psycholinguistic research on discourse, such as contrastive rhetoric (expository prose), story grammar (narrative prose), and cohesion (anaphora, in particular). Carrell (1983b) used the terms content and formal schemata to refer to prior knowledge of content and text structure, respectively.

### CONTENT SCHEMATA AND SECOND LANGUAGE/SECOND CULTURE COMPREHENSION

According to Carrell (1983b), recent empirical research on schemata in first and second language reading comprehension can be classified into three major categories: Content Schemata, Formal Schemata, and Formal/Content Schemata Confounded. For the record, Carrell's classification of first language studies into these categories are presented in Figure 2. While I do not intend to review most of these studies, let us examine the findings of cross-cultural and cross-linguistic studies on second language and second culture comprehension. The following studies, which are identified in Figure 1, have shed light on the processes of readers from various cultures and language backgrounds.
Figure 1. A schematic tree diagram of research on cross-cultural schemata.
Cultural Schemata

One of the early reports of the influence of cultural schemata is that of Bartlett (1932), who reported observations of how Englishmen read and recalled stories based on North American Indian folk tales. Bartlett recognized that when readers process unfamiliar text, manifestations of the cultural differences in schemata are evident. Fifty years later, Kintsch and Greene (1978) presented American college students with two stories: one a Grimm fairy tale, the other an Apache folk tale. Recall protocols indicated that the American students better recalled the Brothers Grimm story than the Apache folk tale. Carrell (1983b) noted that this experiment involved a confounding of formal and content schemata. And, as Steffensen, Joag-Dev, and Anderson (1979) pointed out, Kintsch and Greene did not require American Indian readers to read both stories. So, Steffensen, Joag-Dev, and Anderson (1979) designed a more intricate study in which American and Indian university students read two letters, one about a wedding in each of the countries, America and India. Free and probed recall data indicated the influence of cultural schemata in reading both letters. Readers distorted information contained in letters from unfamiliar cultures as well as recalled more relevant idea units from the letters about their own cultures. Similarly, subjects read more rapidly the letters about the wedding in their own culture.

Steffensen and Colker (1982) conducted an additional experiment comparing the listening comprehension performance of American and Australian aboriginal subjects while hearing two stories, each about the medical beliefs of

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<th>FORMAL SCHEMATA</th>
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<td>Thorndyke (1977)</td>
<td>Bransford &amp; Johnson (1972)</td>
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Figure 2. Some empirical research studies of formal and content schemata in English. Adapted from Carrell, 1983b. Used with author's permission.
their respective cultures. The researchers found that subjects recalled much more gist and made more appropriate elaborations for the stories about their own culture, while there was less gist recall and more distortion of the foreign passages.

A related study by Reynolds, Taylor, Steffensen, Shirey, and Anderson (1981) documented similar phenomena in the reading comprehension of urban Black and agrarian white eighth graders, who read a letter about an incident in the school cafeteria; the letter included quotations of ritual insults (playing the dozens) commonly found in the Black community. While the urban Black readers readily comprehended the passage and recognized the sounding/playing the dozens, the white agrarian students interpreted the events in the cafeteria to include physical aggression, thus, distorting the intended meaning of the events in the letter. Subsequent evaluation of the protocol data from these three experiments revealed that there is a close interrelationship of cross-cultural schemata, register, and cohesion in second culture reading comprehension (Steffensen, 1981). These experiments by Steffensen and associates are themselves strong arguments for the roles of cultural and discourse factors in the reading process. Cultural knowledge cannot be ignored in a model of reading.

While much cultural schemata research is conducted with adult subjects, only a few studies examined cross-cultural variables in the reading comprehension of elementary school children. In addition to the previously mentioned Reynolds et al. (1981) study, which used free and probed recall data, a more recent study (Andersson, 1981; Andersson & Gipe, 1983) used probed questioning to determine the role of creativity variables and cultural schemata on inferential reading comprehension by sixth-grade children from New Orleans and New York metropolitan areas.

Andersson constructed 24 short passages, each controlled for story structure. Six of the passages contained cultural and religious content familiar to New Orleans area Catholic children, six passages contained cultural and religious content familiar to New York Greek Orthodox children, six passages contained information generally known to all children, and six passages contained information generally unknown to everyone.

According to Andersson, students in the New Orleans area were familiar with Mardi Gras, crawfish boils, the French Quarter, streetcars, All Saints' Day, and Jackson Square. The New York participants, who had been reared in the Greek traditions of their families, were familiar with Nameday celebrations, Greek Independent Day events, 40-day memorial services, Greek Easter services, Orthodox christenings, and New Year's Day rituals. The study demonstrated a strong relationship between cultural group and performance on measures of inferential reading comprehension. Sixth-grade students inferred information better for the passages that related to their own cultures. In addi-
Effects of Cross-Cultural Schemata

tion, children who were judged as creative individuals, as measured by tests of creativity, tended to take more risks at inferring information about unfamiliar topics. Using the same passages, Pitts (1982) and Pitts and Thompson (1984) reported that inferential reading is also related to students’ cognitive styles. (For a related study on children’s schemata and reading recall of Catholic and Jewish religious topics, see Lipson, 1983.)

Taken as a whole, these studies on cultural comprehension illustrate how cultural schemata affect inferential and literal comprehension and recall; but these studies, in general, did not examine cultural variables interacting with second language factors. However, another set of studies examined the roles of cultural knowledge in the reading comprehension of second language learners.

Cultural Schemata and Language

There is a slowly growing body of literature examining the role of schemata in second language comprehension. These ESL studies followed experimental research paradigms in schema theory, with protocol data of non-native English-speaking subjects.

Johnson (1981, 1982) investigated the role of background knowledge on reading performance of university level ESL students. In the first study, Johnson examined the potential interaction of language complexity and cultural background on the reading comprehension of Iranian intermediate/advanced ESL students and American English-speaking subjects, all of whom read stories from Iranian and American folklore. Two versions of each story were also constructed by varying the syntactic complexity (simplified syntax vs. more complex syntax). One half of each cultural group read the simplified texts of stories from both cultures. The other half read the syntactically more complex texts. Johnson concluded that (a) language complexity did not have as much an effect on the Iranian subjects’ comprehension as cultural origin of the text. (This finding about the role of cultural origin of text is also confirmed by Carrell [1981b] with Japanese and Chinese subjects, who read Japanese, French, and Apache Indian folk tales.) (b) Native readers were influenced by both language complexity and cultural origin of the text. (c) Both cultural groups recalled a similar number of implicit propositions; yet, subjects made more cultural inferences/elaborations in the recall of the text from their own culture. This study documents the interaction of language and culture in text comprehension.

Johnson’s (1982) later experiment studied advanced level ESL students in reading a text which contained sections of familiar and unfamiliar information about Halloween. Four groups of subjects read the text with varying treatment conditions. Group one read a passage without a list of important vocabulary. Group two studied the definitions of target words before reading the passage.
This group did not have the definitions while reading the text. The third group studied the target words before reading a text with the key vocabulary also defined in the text. Group four had the benefit of prior study of word definitions as well as the words defined in the passage. Subjects were asked to participate in free recall and recognition tasks. In general, Johnson found that readers recalled more propositions from the familiar than from the unfamiliar portions of the text. Johnson also found that vocabulary exposure did not produce a significant effect on recall. Thus, prior knowledge (content schemata) was more important to ESL readers than vocabulary definitions.

Hudson (1982) presented university level ESL students with nine graded reading passages adapted from SRA lists. Three treatment conditions included (a) reading texts with a prior knowledge context, a visual representation and questions; (b) reading texts with prior exposure to key vocabulary; and (c) reading texts with no prior priming. While advanced level ESL readers outperformed lower level readers, the prior content treatment was more effective at the beginning and intermediate ESL levels. The treatments were not crucial at the advanced level of ESL proficiency. Hudson argued that induced schemata can compensate for many negative effects of subjects’ limitations in second language proficiency or limited ability of lower level reading skills. This study provides further evidence to support the claim that second language reading is an interactive process.

Finally, research by Carrell (1983c) further illustrates the interactive nature of the second language reading process. Carrell investigated the effects of three aspects of background knowledge (context, transparency, and familiarity) on the reading comprehension of three groups of readers (native English speakers, advanced ESL readers, and high intermediate learners), all of whom read passages such as variations of the balloon and laundry passages of Bransford and Johnson (1972). Within the context variable, subjects read the passage either with a title and picture or with no context (context vs. no context); within the transparency variable, passage variations either contained or did not contain lexical items critical to comprehending the text (transparent vs. opaque); within the familiarity variable, there was either the presence or absence of schemata in the reader (familiar vs. novel). Significant effects were found for the three variables of background knowledge. In general, Carrell found that nonnative English readers were less efficient at using contextual and textual clues in reading. Yet, advanced ESL readers recalled novel text better than familiar text. For a similar experiment, see Carrell and Wallace (1983).

These studies clearly demonstrate the interactive nature of second language reading, as schemata, context, and language are critical variables in a model of first and second language reading. These studies primarily examined adult subjects. Future studies need to examine the interaction of language and schemata in children’s development of reading. Nonetheless, the studies on
cross-cultural schemata in a first and second language can be used to argue that culture and language factors are crucial factors in a model of reading. It appears to be the case that prior knowledge interacts with language proficiency. Moreover, just as in first language reading, variables such as schemata and context play important roles, thereby being universals in the reading process.

FORMAL SCHEMATA IN SECOND LANGUAGE COMPREHENSION

While a tradition of research on cross-cultural content schemata has been established, researchers' interest in the effects of discourse schemata are only recently beginning to emerge. Studies on second language discourse comprehension are grouped into two main categories: linguistic studies on rhetorical discourse and psycholinguistic processing studies, the latter category of which has three subcategories: rhetorical processing (expository prose), story grammar (narrative prose), and cohesion. As schemata and text must interact in the comprehension process, these studies can further document the roles of higher level language and cultural factors in an interactive model of reading.

Linguistic Studies on Contrastive Rhetoric

In applied linguistics circles, the research on contrastive rhetoric is receiving considerable attention. This research is relevant to reading researchers interested in the interrelationship of thought patterns and discourse organization in comprehension and composition. According to Kaplan (1966), cultures vary in their thought patterns and their organization of written text. These differences in rhetoric and discourse structure are claimed to influence the English compositions (and by implication, the English reading comprehension) of nonnative speakers. Kaplan (1976) claims that “more significant differences [affecting written language performance] seem to lie in those areas which affect the operation of language at the highest level” (p. 13). These differences influence the discourse processing strategies of nonnative English readers. Thus, research on contrastive rhetoric is important to our understanding of discourse processing and can lead to empirical psycholinguistic experiments for a model of reading.

A few examples of ethnolinguistic thought patterns claimed by Kaplan (1966, 1976, 1983) to be represented in text are outlined below.

*English:* A generally linear pattern is expected in expository writing—Example, topic sentence followed by subdivisions with support of topic statement followed by further development of central idea.

*Semitic:* Semitic languages are characterized by a series of parallel structures.
Oriental: Chinese and Korean are characterized by a “turning and turning in a widening gyre.” A writer does not describe a subject directly but discusses it from a variety of views tangentially related, thus, writing around the topic.

Romance: Prose in French or Spanish is characterized by many digressions with additional material. Moreover, there is a higher proportion of coordinate structures, nonsequential sentences, additive constructions, and short paragraphs in Spanish than in English.

Linguists have found culturally specific discourse patterns in various other non-Western languages. The Hindi language of India contains a spiral-like discourse structure in which digressions are tolerated for the purpose of linking the various episodes, although, depending on the register, Hindi can also be linear (Kachru, 1983). Kachru further adds that the cyclical and nonsequential pattern is characteristic of the Indic tradition of expression, whereby a given theme is viewed from different perspectives. The purpose of any art form (e.g., literature, music, painting) is to resolve the diversity into a theme (Kachru, 1983). Discourse structure in Marathi, a related language, also contains culturally specific discourse patterns (Pandharipande, 1983).

Another linguistic pattern is that of coupling, found in Vietnamese as a “text building strategy and heuristic procedure” (Schafer, 1981, p. 121). Vietnamese, a language strong on idiomaticity, contains compound words that are coupled together. Coupling is the “juxtaposing of two items that are antithetical or nearly antithetical in meaning” (Schafer, 1981, p. 119). This linguistic phenomenon is embedded within the culture as the people view their country as “emerging from the reconciling of opposites between dragon and fairy, sea and mountain, water and land” (Schafer, 1981, p. 119). Thus, there is a close interrelationship between language and culture, paralleling the thought patterns and written texts of particular ethnolinguistic groups. (For a discussion of the interrelationship of thought, language, and culture, see Fishman [1982], who describes renewed interest in the work of Benjamin Whorf.)

The validity of the interrelationship and interaction of text, culture, language, and cognition (schemata) can be tested by examining second language and second culture reading comprehension. To what extent do culturally specific and linguistically variant thought/discourse patterns influence second language reading comprehension? To what extent do text contrasts affect the processing strategies and recall of adults' reading of culturally and linguistically different texts. These are important areas of research and only a few studies have been conducted along these lines.
Psycholinguistic Processing Studies

There is comparatively little psycholinguistic research available on cross-cultural discourse processing, but interest in this area is increasing. Processing studies can be developed from and classified in at least three different paradigms: expository discourse, story grammar, and cohesion.

Expository processing. Research on second language comprehension of expository prose was conducted by several researchers: Carrell (1984b), Connor (1984), Connor and McCagg (1983), and Hinds (1983). As cited by Carrell (1984c), Hinds conducted research on Japanese and English readers who read texts in their own language. The experimental texts in both languages conformed to Japanese rhetorical patterns. Recall protocols indicated that English readers processed the Japanese discourse with far more difficulty than did the Japanese readers. The differences in Japanese and English discourse patterns were found to affect the processing strategies of English readers. It can be inferred that English readers used their English-processing strategies, which were not appropriate in sampling and predicting information represented in a foreign discourse pattern. This illustrates the roles of culturally specific discourse patterns in reading comprehension.

Other research by Connor (1984) and Connor and McCagg (1983) examined the effects of discourse structure on the recall of text by adult first and second language learners. Advanced ESL students from two language groups (Spanish and Japanese) and native English speakers read both an expository text in which the ideas were structured hierarchically and a text in which there was not a linear sequence of events. Written recall protocols indicated that there was little difference in the recall of higher level ideas, but there was a difference in the subjects' recall of subordinate ideas. Native English speakers recalled subordinate ideas better than nonnative speakers. Furthermore, nonnative speakers tended to recall sequence of events in the order they were presented in the passage, while native speakers were more inclined to reorder the text to conform to real-world schemata. However, cultural discourse patterns did not seem to influence the overall written recall of the three language groups. Perhaps, content schemata and language proficiency were stronger factors in the comprehension and composition process. Thus, the interactive model can still be supported.

A more recent experiment by Carrell (1984b) was conducted to investigate the effects of various different English rhetorical patterns on the reading recall of adult ESL students who were native speakers of Spanish, Arabic, and Oriental languages. An English text was constructed to adhere to various discourse types identified by Meyer and Freedle (1984). Carrell found significant effects for the type of recall condition (immediate vs. delayed recall), the discourse
type, and the language group. Variation in the discourse type influenced the amount of recall of ESL readers, who would recall idea units more easily in patterns of comparison, causation, and problem/solution than in the collection of descriptions pattern. More interestingly, the recall of ideas by specific language groups was better facilitated by different textual patterns. For example, the collection of descriptions and problem/solution patterns were more facilitative of recall for the Arabic readers while the collection of descriptions pattern was least facilitative for the Spanish and Oriental readers. Similarly, the causation pattern was most difficult for Arabic readers but much easier for the other groups. Thus, different discourse types influence the discourse processing of expository prose by various cultural groups. The knowledge of linguistically and culturally specific discourse patterns guide the expectations of readers as they process native and nonnative texts. If the content and discourse patterns match the readers' expectations, more efficient comprehension and recall is likely to occur. Thus, text and text schemata are interdependent variables in native and nonnative speakers' model of reading.

**Story grammar.** While the studies described above examined expository prose processing, there are some studies that have examined cultural and cross-cultural story grammar. (For a review of story grammar, see Stein and Trabasso [1981]; for a review of universal and culture-specific aspects of story schemata, see Brewer [1984].) Although oral and written stories contain universal properties, cultural variations may exist in such aspects as openings, settings, characters, events, resolutions, closings (Brewer, 1984). While most story grammars are based on Western literature, there may be some differences from other cultures. Matsuyama (1983) pointed out that 80% of Japanese folktales did not contain goal structures for the main character, and that story grammar nodes such as Thorndyke's (1977) goal, subgoal, outcome, and resolution are not applicable to most Japanese folktales.

Only a few experiments have been conducted on the reading of culturally different texts. Kintsch and Greene's (1978) experiment (discussed earlier) demonstrates story structures to be culturally specific and, therefore, capable of affecting the recall of readers not familiar with the pattern. However, counter evidence by Mandler, Scribner, Cole, and DeForest (1980) suggests that the structure of folktales may be a universal part of human memory. They asked literate and nonliterate children and adults who were Vai speakers in Liberia to recall a series of stories previously used by Mandler and Johnson (1977) in their examination of reading recall. They found that Liberian and American subjects, after hearing stories in their native languages, recalled stories in a similar fashion. Mandler et al. (1980) argued that story structures are universal. Although the Kintsch and Greene (1978) and Mandler et al. (1980) studies produced contrasting evidence, Brewer (1984) commented that
these studies are problematic in that their theoretical frameworks do not distinguish between three types of structures: event, narrative, and story. Thus, more research is needed on the roles of more specific elements of stories on cross-cultural story comprehension.

Related studies, influenced by the story grammar paradigm, have examined second language recall of sequence of events (Carrell, 1984a; McClure, Mason, & Williams, 1981). Carrell (1984a) asked whether intermediate level ESL readers are influenced by story schemata in reading stories in their second language. Using Mandler and Johnson’s (1977) system, Carrell compared the recall protocols of two types of stories: those well structured according to the sequence of events and those that deliberately violated the sequence of events where the ideas were interleaved. Carrell found that the quantity of nodes recalled was strongly influenced by the sequence structure, the standard sequence being favored over the violated sequence. Carrell also found that ESL readers recalled the sequence of events of the violated stories in the order consistent with the ideal story-schemata order.

While Carrell’s study did not investigate cultural differences in sequencing, McClure, Mason, and Williams (1981) studied story sequencing of third-, sixth-, and ninth-grade children of three urban populations: Black, Hispanic, and Anglo in Chicago. Using an unscrambling story technique of a previous study (McClure, Mason, & Barnitz, 1979), the researchers examined the sequencing of three different story organizations. While social class, sex, and school location were not found to be significant in sequencing stories, significant effects of grade level and reading achievement were evident. Some evidence emerged to substantiate the claim that the different ethnic groups used different discourse strategies. For example, the rhetorical strategy of beginning a story with a question was used more frequently by Hispanics than by Blacks, who frequently started stories with summary statements. Research does provide evidence for the interrelationship of language and culture schemata in the cross-cultural processing of stories. Yet, more research is needed to investigate these interrelationships and, certainly, more research is needed on children’s story reading.

**Cohesion.** Textuality, according to deBeaugrande and Dressler (1981), contains several characteristics, of which cohesion has received the most attention. (Other characteristics of textuality include coherence, intentionality, acceptability, informativity, situationality, and intertextuality. See Carrell [1985a] for a discussion of deBeaugrande and Dressler’s theory.) Cohesion is the property of text whereby the surface elements of a text are connected, while coherence is the property of text where the underlying ideas or “meanings” are connected. While a large body of literature exists on the structure of text (Morgan & Sellner, 1980; deBeaugrande & Dressler, 1981) and implications for
first language reading (Tierney & Mosenthal, 1982), comparatively few studies examine second language and second culture text comprehension. Most of these studies, save the studies mentioned in earlier sections, focus on cohesion influences on reading.

Evidence does exist that cohesion interacts with register in cross-cultural comprehension. Steffensen (1981) analyzed the data from earlier mentioned experiments on cross-cultural schemata (Reynolds et al., 1981; Steffensen & Colker, 1982; Steffensen, Joag-Dev, & Anderson, 1979). She found that in recalling the unfamiliar wedding texts, American and Indian subjects used causal conjunctions to connect propositions that were not supposed to be connected in a cause-effect relationship. Thus, lack of specific background schemata led to the inappropriate use of cohesive connectives. Therefore, problems of cohesion in second language comprehension may result from underdeveloped schemata and not just from underdeveloped linguistic knowledge of cohesion.

Most of the research on cohesion falls into the category of anaphoric processing and, more particularly, pronoun reference. (See Barnitz [1986] for a review of studies on first language anaphoric processing.) Unlike first language anaphoric-processing research, there are comparatively few studies on second language anaphoric processing.

Barnitz (1981) investigated the effects of pronoun-referent variables on the reading comprehension of short experimental texts by Vietnamese high school students. Similar to an earlier study of native English-speaking children (Barnitz 1980), he found that probed recall was affected by the type of referent (noun phrase > sentence) and direction of reference (forward > backward pronominalization). In addition, he found that the distance between pronoun and referent, although not carefully controllable in short passages, was a significant variable—the closer the distance, the better the recall of antecedents. The distance variable was also found to affect the reading of ESL subjects in other studies. Cowan (1982), cited by Parish and Perkins (1984), investigated the role of ESL language proficiency level (elementary, intermediate, advanced) on the ability to identify inter- and intra-sentential anaphora. Farsi, Spanish, and Arabic students at higher levels outperformed the intermediate group, which in turn outperformed the elementary group. A similar finding was reported by Robbins (1984), who found that English proficiency level was significant in anaphoric processing. Robbins also noted that the pronouns it and they in the backward intersentential condition were most difficult for ESL readers.

Parish and Perkins (1984) also reported that the number of possible antecedents and the distance between pronouns and antecedents affected the discourse processing of ESL students at the elementary, intermediate, and ad-
advanced placement levels. They argued that frequent use of antecedents adds to the processing loads of the ESL students. Higher proficiency students are better equipped to process anaphora because they control more English vocabulary, syntax, discourse schemata, and reading strategies than do lower level students. Thus, there is an interaction of language proficiency, discourse structure, and reading performance of second language speakers.

More research is needed on second language anaphoric processing, especially in light of the findings of Steffensen (1981). Research needs to sort out the extent to which the recall or comprehension breakdown is due to limited linguistic awareness of pronominalization phenomena in discourse or is due to insufficient or incomplete content schemata. Such research should add support to the interactive, constructive nature of the first and second language reading process. Moreover, substantial research is needed to examine the interaction of various text variables, such as the interrelatedness of cohesion, coherence, and rhetorical structure. Second language text comprehension is so complex that sophisticated experimental and naturalistic studies will lead to a clearer understanding of reading and language learning.

SUMMARY, DISCUSSION, AND CONCLUSION

Research on cross-cultural schemata can be classified into two main branches: content schemata and formal schemata. Most of the cross-cultural research has examined cultural schemata of texts from nonnative cultures, while there is a growing interest in the role of schemata in second language comprehension. Research studies on formal schemata fall into two natural categories: linguistic studies on written rhetorical patterns of various cultures and psycholinguistic studies of the discourse processing of culturally different texts and/or culturally different populations. This latter group is subdivided into three natural categories: rhetorical processing (expository prose), story grammar (narrative prose), and cohesion/anaphora. How do the conclusions of these studies and those on content schemata relate to our understanding of the interactive model of reading a second language? And, how do these studies relate to our understanding of reading instruction? These issues will be addressed generally.

The studies on cross-cultural schemata demonstrated the importance of cultural variables in the reading process. Readers' knowledge of cultural content, represented in culturally variant texts, can influence their construction of meaning for the text. The cross-cultural research provides insights into the types of elaborations and inferences made by readers. During top-down processing, readers construct meaning in terms of their own prior knowledge,
goals, and belief systems. These aspects of cognition serve as filters of relevant and irrelevant information; thus, culturally variant readers may distort text information or add information not relevant to the text (see Steffensen, 1981). This phenomena is similar, however, to any reader's comprehension of unknown material.

Instructional practices, which bridge the cultural knowledge gap between the native culture of the reader and the new cultural information in the text, should be implemented. Strategies which build background knowledge and interrelate schemata with text are crucial. Building and accessing cultural schemata can provide the necessary context for text comprehension. For instructional implications and strategies, see Andersson & Barnitz (1984), Barnitz (1985), Carrell (1984c), Carrell and Eisterhold (1983), and Joag-Dev and Steffensen (1980).

The research on ESL schemata demonstrates the interaction of language and schemata variables in cross-cultural discourse processing. While language proficiency levels may facilitate or "short-circuit" the reading process (Clarke, 1979), many second language learners may compensate for limitations in second language knowledge by relying on their content schemata (Hudson, 1982). This may be a successful coping strategy if the readers are familiar with the cultural content. (There is also evidence that children's second language proficiency may be sufficient for, and enhanced by, exposure to reading [see Hudelson, 1984].) Nevertheless, language proficiency variables can influence the top-down and bottom-up strategies of readers (Carrell, 1983c; Cziko, 1980). As language proficiency is a variable in first and second language reading, supportive language expansion methodologies can be employed within the context of meaningful reading instruction. (See Barnitz [1985] for a discussion of language-reading instructional strategies for developing awareness of schemata, vocabulary, discourse, syntax, morphology, and phono-orthography.) However, the best language-based reading instruction needs to be holistic with the use of natural texts (e.g., Language Experience Approach, Directed Reading—Thinking Activities).

Not only does the research on content schemata contribute to theory and practice in second language/second culture reading, but the research on formal schemata can also influence theory and practice. However, there is still a need for more research in this area. The applied linguistic research on contrastive rhetoric and the psychological work on story structures contribute immensely to our understanding of universal and culturally specific properties of expository and narrative texts. The few psycholinguistic studies demonstrate that cultural differences in rhetorical patterns and story structures influence comprehension and recall. Readers' knowledge or lack of knowledge of the culturally specific discourse patterns will influence their expectations and prediction strategies during reading. If the text organization matches their expectations,
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there will be a better chance of comprehension and recall. If the text structure is beyond their awareness, comprehension may be impaired. Thus, a native English reader, encountering non-Western expository and narrative prose and coping with language differences and content, will have to struggle with discourse patterns. Likewise, foreign students reading English prose not within their discourse experience will need to learn new text patterns and prediction strategies in addition to the basic language processes of English. Thus, there is an interaction of these text variables and other text variables (e.g., cohesion) in the reading process. Research and instructional practices need to be implemented in this growing area of interest in the fields of reading and second language teaching. See Barnitz (1985) and Carrell (1984c) for instructional strategies for guiding students through unfamiliar expository and narrative text, for example, mapping, questioning, outlining, etc.

This review allows the reading profession to consider needs for further research:

1. There is conflicting evidence concerning the extent to which language differences and language proficiency influence reading comprehension. More naturalistic and experimental studies will contribute to our body of knowledge on this issue.

2. While much of the cross-cultural research examined the comprehension of adults, more research is certainly needed on cultural and linguistic influences on children's reading. For example, how do discourse differences in oral and written language influence learning to read a second language?

3. To what extent are bottom-up and top-down processing strategies used by second language readers as compared to native English readers?

4. As there is conflicting evidence about the roles of cultural specific and cultural universal story structures in second culture reading (Kintsch & Greene, 1978, vs. Mandler et al., 1980), more research is needed to explore the roles of story structure (see Brewer, 1984).

5. The research on cross-cultural rhetoric is a worthy area of exploration. Not only are more cross-cultural text analyses needed, but also needed are more psycholinguistic studies on the influences of cross-cultural rhetorical styles on comprehension and composition. To what extent are comprehension and composition problems the result of developmental factors rather than “interference” or negative transfer from the native language and culture? (See Mohan and Lo [1985] for an argument for the developmental view pertaining to English compositions by Chinese students.)

6. Further research needs to examine the roles of very specific elements of cohesion and coherence on second language discourse comprehension as these interact with content schemata.
7. Finally, research on instructional practices would validate various methodologies for developing second language reading comprehension.

It is anticipated that such research will further develop the theoretical literature supporting the claim that cultural schemata and language factors are crucial components of the reading process in a first and second language.

Research crossing disciplinary lines can support our understanding of the second language and second culture reading comprehension process. While models of reading already include content schemata and discourse structure (Spiro, Bruce, & Brewer, 1980), the roles of cultural and second language factors in text comprehension have received comparatively minimal attention in the field of reading. Similarly, reading comprehension has been given little attention in the fields of language learning, where efficient reading is only very recently becoming viewed in terms of both top-down and bottom-up processes (Carrell, 1985a, 1985b). However, as both fields are becoming more multidisciplinary, improved theoretical models of reading, second language learning, and second language reading can emerge. In this context, this research review functions as an argument for including a cultural component in models of first and second language reading.

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