SECOND LANGUAGE READING STRATEGY RESEARCH AT THE SECONDARY AND UNIVERSITY LEVELS: VARIATIONS, DISPARITIES, AND GENERALIZABILITY

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Abstract

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Because of the interactive nature of variables involved in reading a second language text, an attempt to evaluate different studies that examine L2 strategies in terms of their generalizability is necessary. This article highlights some L2 reading strategy investigations in order to illuminate the disparities in research methods utilized across studies that are conducted with participants beyond the elementary school grade levels. It includes an extended discussion of some relevant research and provides tables to visually display the variations. Because of the highlighted differences in the database of research it is difficult to formulate generalizations, thereby limiting the instructional implications. Suggestions for future research are also provided.

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Introduction

In general terms, learner strategies are the cognitive steps learners use to process second language input. These cognitive procedures include retrieving and storing new input. According to Brown (1994), strategies are the specific "attacks" that learners employ when faced with a problem. More specifically, reading strategies are the comprehension processes that readers use in order to make sense of what they read. This process may involve skimming, scanning, guessing, recognizing cognates and word families, reading for meaning, predicting, activating general knowledge, making inferences, following references, and separating main ideas from supporting ideas (Barnett, 1988). Obviously, some strategies may be more useful than others with different types of reading texts and tasks.

A plethora of studies examine the comprehension strategies that second language readers utilize to process a text. Regardless of the methodology used in the research process of these students, all researchers engage in similar activities. The research process generally includes a problem statement, a literature review, a sample of participants, the tests or measurement instruments, and the procedures of data collection and analysis. In a detailed examination of some L2 reading strategy studies, it is evident that the participants are quite diverse, some from the elementary, secondary, and university levels, some from remedial reading classes, and others enrolled in courses taught at non-university language centers. Obviously, the participants are of many different ages and backgrounds. Furthermore, the investigators use a variety of research methods and tasks to examine strategy type and frequency of strategy use: think-aloud verbal reports, interviews, questionnaires, observations, and written recalls (Bernhardt, 1991). These tasks may be executed at both the sentence-level as well

as at the connected discourse level, and they are performed with reading passages that vary in content or topic, difficulty level, and text type or genre. In summary, the studies differ in *text* type and *test* type. Because of the wide variety of participants, tasks, and reading materials employed in studies that examine L2 reading strategies, it is difficult to compare results across studies. This article provides an extended discussion and analysis of studies that have been cited for years and also highlights some more recent investigations. All of the selected studies are conducted with participants at the secondary and university levels. This review is by no means exhaustive, but rather the selected studies in the discussion serve to illustrate the difficulty involved in making generalizations concerning the role of strategies in the L2 reading process for the upper levels of language instruction. Table 1 provides a brief summary of the selected studies.

Table 1. Foreign Language Reading Strategy Research

Author	Participants/Methods	Coding Scheme	Results
Hosenfeld 1977	Ninth grade students learning French; 20 successful readers and 20 poor readers; think-aloud reports for each sentence they read	Two different codes: Main-meaning line and word-solving strategies	(1) Successful readers kept meaning of passage in mind while assigning meaning to sentences; whereas poor readers focused on solving unknown words or phrases
Block 1986	9 university level ESL and native English students in a remedial reading course; think-aloud reports for each sentence they read	Two different codes: General strategies and local strategies	(1) More successful readers: (a) used their general knowledge; (b) focused on the overall meaning of text; (c) integrated new information with old; (d) differentiated main ideas from supporting points. (2) The poor readers rarely did any of the above.
Sarig 1987 (L1 and L2 study)	Ten female native Hebrew readers studying English as a foreign language; think-aloud reports while reading native language texts and foreign language texts	Four different codes: (1) technical aid, such as skimming, scanning, using glossary (2) clarification and simplification such as decoding meanings of words, paraphrasing, syntactic simplification (3) coherence detection such as identification of text type and use of prior content schemata	(1) Subjects transferred strategies from L1 into L2 reading (2) Global strategies led to both successful and unsuccessful reading comprehension (3) Clarification and simplification strategies contributed to unsuccessful reading

		(4) monitoring moves such as mistake correction, slowing down and identification of misunderstanding	comprehension in L1 and L2
Barnett 1988	278 university level students learning fourth semester French; Some students were taught reading strategies and others were not; Strategy use questionnaire	Two different codes: text-level (global or top-down strategies); word-level (local, or bottom-up strategies)	(1) Higher comprehension scores were achieved by participants who considered context while reading. (2) Participants who were taught strategy use understood passages better.
Carrell 1989	75 native English speakers learning Spanish in first, second, and third year courses; 45 native speakers of Spanish in intermediate ESL courses; Written strategy use questionnaires, multiple choice comprehension questions	Two different codes: Global or top-down strategies; Local or bottom-up strategies	(1) Spanish as a foreign language group at lower proficiency levels used more bottom-up processing strategies (2) ESL group at advanced levels used top-down strategies
Pritchard 1990	60 students (30 from USA and 30 from Palau) from 11th grade	(1) developing awareness (2) accepting ambiguity (3) establishing intrasential ties (gathering information, paraphrasing, etc.) (4) establishing intersentential ties (reading ahead, extrapolating, etc.) (5) using background knowledge	When content of reading materials change, processing behavior changes as well.
Anderson 1991	26 Spanish speaking adult English as Second Language students; DTLS (Descriptive Test of Language Skills Reading Comprehension Test) with multiple choice questions; TRP (Textbook Reading Profile) with think-loud reports	(1) understanding main ideas (2) understanding direct statements (3) drawing inferences Coding Scheme for TRP: (1) supervising (2) supporting (3) paraphrasing (4) establishing coherence (5) test taking	(1) Students who used more strategies comprehended better (2) No significant relationship between the amount of unique strategies and comprehension
Block 1992	16 proficient readers of English, 9 non-proficient readers of English; think aloud	Two different codes: Meaning based (global) and word level (local)	(1) Less proficient readers used local strategies (2) More proficient readers relied

	oral reports at sentence level		on global strategies
Raymond 1993	43 native English readers of French from high intermediate level of French; written questionnaire and written recall	(1) Top Level Structure Strategy (2) No Top Level Structure Strategy	Training in structure strategy helped increase the amount of idea units recalled
Young and Oxford 1997	49 native English readers of Spanish (26 females and 23 males); think aloud oral reports	Global or Local	(1) No significant gender differences in the mean use of global vs. local strategies (2) Females solved vocabulary problems more (3) Males monitored reading pace and paraphrased more than females
Liontas 1999	60 native English readers of third year university level Spanish, French, and German (18 men and 42 women); Computerized-mediated Reading Tasks for each idiom and text read (Idiom Detection Task, Zero Context Task, Full Context Task, and Eureka Task), Interactional Reading Tasks (Think-Aloud Reading Tasks, Retellings, and Introspection), and Demographic Data Collection and Post-Task Evaluations	Top-down and/or Bottom-up	(1) L2 readers detect, comprehend, and interpret vivid phrasal idioms in texts using both top-down and bottom-up strategies simultaneously (2) matching idioms between L1 and L2 (Lexical-Level or LL Idioms) are processed and comprehended faster and with greater ease than partially-matching idioms (Semi-lexical Level or SLL Idioms) or non-matching idioms (Post-lexical Level or PLL Idioms) between L1 and L2 (3) increased context and an individual's pragmatic knowledge exert a significant impact on the comprehension and interpretation of all idioms, especially on those of the PLL type
Schueller 1999	128 native English readers of German from second year university courses (78 females and 50 males); strategy use questionnaire, multiple choice and written recall comprehension tasks	Top-down or Bottom-up	Every female group did better than the males regardless of strategic training with only one exception: only males with top-down strategy training did better than females on multiple choice (but not on recall)

Brantmeier 2000	78 native English readers of Spanish (29 men and 49 women) from an intermediate level Hispanic culture course; written strategy use questionnaire, multiple choice and written recall comprehension tasks	Global or Local	(1) Males and females use almost the same number of global and local strategies (2) There is a gender-related difference in reading comprehension, but no gender-related difference in strategic behavior

In a qualitative study, Hosenfeld (1977) examined successful and unsuccessful readers to find out what types of cognitive operations they used to process written texts. Participants were ninth grade students who were learning French. Before conducting her study, she classified readers based on a test of L1 reading. She selected twenty native English speaking students who scored high on the MLA-Cooperative Test of Reading Proficiency, a standard test of native language reading, and twenty unsuccessful students with low scores on the same test. In an oral interview fashion participants were asked to read a text and do think-aloud reports, that is, she directed them to say in their first language whatever comes to their mind while processing each sentence in the text. Hosenfeld concluded that the successful readers kept the meaning of the passage in mind while reading, skipped words unimportant to the meaning of the sentence, read in "broad phrases," used context to determine word meaning, and had a positive self-concept as a reader. Poor readers, on the other hand, translated sentences and lost the general meaning of the passage, rarely skipped words, looked up unknown words in a glossary, and had a poor self-concept as a reader. While these results clearly described the strategies students used to process the text, they did not link the strategy use to comprehension of specific paragraphs or to the text as a whole. The data only focused on sentence-level comprehension. The results of the study do not reveal overall comprehension of the entire text.

A decade later, Block's (1986) "general comprehension" and "local linguistic" categories echoed Hosenfeld's (1977) binary classification of strategies. Block compared the reading comprehension strategies used by native English speakers and ESL students who were enrolled in a remedial reading course at the university level, and she connected these behaviors to comprehension. All of the participants were designated as non-proficient readers because they failed a college reading proficiency test *before* the study. Subjects read two expository passages selected from an introductory psychology textbook, and were asked to do a think-aloud while reading (they reported after each sentence). After reading and retelling each passage, the participants answered twenty multiple choice comprehension questions. They were allowed to consult the passages while answering the comprehension questions.

Block developed a coding scheme to classify strategies that consisted of two types: general strategies and local strategies. General strategies included the following behaviors: anticipate content, recognize text structure, integrate information, question information, distinguish main ideas, interpret the text, use general knowledge and associations to background, comment on behavior or process, monitor comprehension, correct behavior, focus on textual meaning as a whole, and react to the text. Local strategies were: paraphrase, reread, question meaning of a clause or sentence, question meaning of a word, and solve a vocabulary problem. Results demonstrated that language background (native speakers of Chinese, Spanish and English) did not account for the use of particular strategies. Of the 9 ESL students in the study, the readers with higher comprehension scores on the retellings and the multiple choice questions integrated new information in the text with old information, distinguished main ideas from details, referred to their background, and focused on the textual meaning as a whole, all classified as "general strategies."   On the other hand, readers with low comprehension scores

rarely distinguished main ideas from details, rarely referred to their background, infrequently focused on textual meaning, and seldom integrated information. Again, the participants were all from a remedial class and had failed a reading proficiency exam.

Sarig (1987) investigated the contribution of L1 reading strategies and L2 language proficiency to L2 reading, as well as the relationship between L1 and L2 reading strategies. Sarig's subjects were 10 female native Hebrew readers who were studying English as a foreign language. Subjects read academic texts in L1 and L2 and were asked to self report their reading behaviors. Sarig classified the data from the think-aloud reports into four general types of behaviors or responses: (1) technical aid, (2) clarification and simplification, (3) coherence detection, and (4) monitoring moves. Technical aid strategies included behaviors such as skimming, scanning, skipping, marking the text, using glossary, and so forth. Strategies that involved syntactic simplification, decoding meanings of words and groups of words with the use of synonyms, and paraphrasing were classified as clarification and simplification moves. Coherence-detecting moves included identification of the text type, use of prior content schemata, identification of people and key information in the text, and reliance on textual schemata. Behaviors involving active monitoring of text processing were classified as monitoring moves, and these included behaviors such as conscious identification of misunderstanding, change of planning the tasks, mistake correction, slowing down, and other direct moves intended to monitor text processing. Sarig's results revealed that her subjects transferred strategies from L1 reading into L2 reading, and that the same reading strategy types "accounted for success and failure in both languages to almost the same extent" (p. 118). Top-down, global strategies led to both successful and unsuccessful reading comprehension. The two language dependent strategies, the clarification and simplification strategies, contributed to unsuccessful reading comprehension in both L1 and L2 (p. 113). Results also indicated that most of the strategies used during the reading comprehension process were particular to each reader, or that each individual read differently and used different combinations of strategies. These results do not duplicate Block's (1986) where global strategies led to successful (not unsuccessful) reading comprehension.

Barnett (1988) examined reading strategies used by students learning French. She was primarily concerned with the real and perceived strategy use among university level students and how it affects comprehension. She used a "text-level" and "word-level" coding scheme. By text-level she referred to the processes used to read the passage as a whole, such as utilizing background knowledge, predicting, reading the title, skimming and scanning (this classification echoes the codes of prior studies that utilized local strategies, top-down strategies, and main-meaning line strategies). When students used word-level strategies they used context to guess word meanings, identified grammatical categories of words, used reference words, and identified word families (this classification of "word-level" strategies is similar to local strategies, bottom-up strategies, and word-solving strategies). Barnett utilized two different groups of students: one group was taught reading strategies and the other was not. The students answered questions on background knowledge before reading the passages. She asked both groups to read an unfamiliar passage in French, and all students wrote a recall in English. They completed a multiple choice comprehension questionnaire where they chose the best continuing sentence. Finally, students answered 17 questions about the types of reading strategies that they used.

The strategy-use questionnaire consisted of many effective and less effective text-level and word-level strategies. The following is a list of strategies that Barnett considered to be effective and less effective:

Effective Strategies
1. reader pays most attention to what the reading passage means
2. reader pays most attention to what the form or grammatical function of the words are
3. reader reads the whole passage once and then rereads it

4. reader finds the topic interesting
5. reader thinks about what s/he knows about the topic of the passage
6. reader often hypothesizes about what might come text
7. reader reads the title first and imagines what the passage might be about
8. reader guesses what some words mean.

Less Effective Strategies:
1. reader pays most attention to what individual words mean
2. reader pays most attention to what the structure of the passage is
3. reader rereads only the difficult sections
4. reader reads only because it has been assigned
5. reader never hypothesizes about what comes next
6. reader reads each paragraph by itself
7. reader reads the title but does not think much about it
8. reader thinks that it is a mistake to skip any words.

Results revealed higher scores as both effective strategy use and perceived effective strategy use increased. Barnett concluded that students who were taught strategy use did show a greater ability to read through context than did their more traditionally taught peers, and that "students who think that they use those strategies considered most productive actually do read through context better and understand more than do those who do not think they use such strategies" (p. 156). Finally, Barnett concluded that there is a relationship between strategy use and reading comprehension level. The students who considered context while reading, a classified effective strategy, comprehended more than those who did not use this strategy. Likewise, students who perceived they used productive strategies scored higher on the comprehension task than those students who did not. An important component in the research methods of this study is that some students were directly taught effective strategies. Most studies do not test the effects of instruction.

Carrell (1989) investigated metacognitive awareness of L2 reader strategies in both their native language and second language, and the relationship between this awareness and their comprehension. Her first group of subjects was native Spanish speakers of intermediate and high-intermediate levels studying English as a second language at a university-level institute. Her second group consisted of native English speakers learning Spanish as a foreign language in first, second, and third year courses. Carrell first asked subjects to read two texts, one in L1 and one in L2. She controlled for content schemata as both texts were on the general topic of "language." The subjects then answered multiple-choice comprehension questions about the text followed by a strategy use questionnaire. The questionnaire examined their reading strategies, and each item asked for students to indicate their level of agreement or disagreement (strongly agree to strongly disagree) on a scale from one to five. She structured the questionnaire to include items concerning (1) confidence, (2) repair, (3) effectiveness, and (4) difficulty. Carrell correlated strategy use with comprehension and concluded that the ESL readers of more advanced proficiency levels perceived "global" or top-down strategies as more effective. With the Spanish as a L2 group she found that at the lower proficiency levels subjects used more bottom-up or "local" strategies (p. 128).

Pritchard (1990) also utilized two different reading passages: a culturally familiar and culturally unfamiliar passage to examine the process of how a reader activates and utilizes the relevant schema to facilitate comprehension. More specifically, his study aimed to identify the strategies proficient readers report employing to develop their understanding of culturally familiar and culturally unfamiliar

passages, and to examine those strategies in relation to the cultural backgrounds of the readers and those strategies in relation to the cultural backgrounds of the readers and the cultural perspectives of the reading materials (Pritchard, 1990, p. 276). Participants in the study were American and Palauan students, and the two passages used were a letter from a woman to her sister describing the events surrounding a typical funeral in each of the two cultures. Pritchard found that the American students used a wider variety of strategies than the Palauans, and they also reported using the strategies more often. Pritchard proposed that the strategy use results were related to cross-cultural differences. In both cultural groups, significantly more idea units were recalled from the culturally familiar text. There were also a greater number of distortions reported in the subjects' retellings of the unfamiliar text, and subjects made more appropriate elaborations when recalling the familiar text. Pritchard's findings suggested that "reading is a content-specific activity; that is, when the content of reading materials changes, processing behavior changes as well" (p. 291).

Anderson (1991) examined individual differences in strategy use on two types of reading tasks: standardized reading comprehension tests and academic texts. The subjects were 28 Spanish-speaking adult students (18 females and 10 males) enrolled in university-level English as a second language courses. On the first day of the study, Anderson assessed participant's reading comprehension skills with a typical standardized test. Two different forms of the Descriptive Test of Language Skills-Reading Comprehension Test (DTLS) were randomly assigned to participants; the test consisted of fifteen reading passages each followed by two to four multiple-choice comprehension questions. The questions were categorized according to three types of reading skills: understanding main ideas, understanding direct statements, and drawing inferences. On a different day, participants completed the second form of the DTLS. A think-aloud protocol where participants verbalized reading strategies was administered with the second form. Subjects also read two passages from the Textbook Reading Profile (TRP), which consisted of academic reading passages taken from freshmen-level texts, and they answered multiple choice comprehension questions for each passage. The strategies were categorized as the following: supervising, supporting, paraphrasing, establishing coherence, and test-taking. The results of Anderson's qualitative and quantitative inquiries demonstrated that for both the standardized reading comprehension test and the textbook reading participants who used more strategies tended to comprehend better. Of relevance is that results also indicated that there is not a statistically significant relationship between the number of particular strategies reported and overall comprehension scores on the reading tasks.

Block (1992) investigated the comprehension-monitoring process used by first and second language readers of English. The subjects were 25 college freshmen, and consisted of proficient and non-proficient readers of English. The results of a standardized test (Descriptive Test of Linguistic Skills) determined the proficiency levels of the students. There were 16 proficient readers (8 L1 and 8 L2 readers) and 9 non-proficient readers (3 L1 and 6 L2 readers). While reading an expository text, the participants were asked to think aloud, or more specifically, to "say everything they understood and everything they were thinking as they read each sentence" (p. 323). The results indicated that when facing a vocabulary problem, proficient ESL readers used background knowledge, decided on whether the word contributes to the overall meaning of the passage, reread the sentence, and used syntactic clues. These meaning-based strategies are classified as global behaviors. On the other hand, non-proficient ESL readers focused on identifying lexical problems and did little to figure out the meaning of words, both signs of processing.

Raymond (1993) examined the effects of structure strategy training on the comprehension of expository prose with native English speaking students learning French as a second language. This study was a partial replication of an investigation conducted by Carrell (1985) where ESL participants who received top level strategy training recalled more information from the text. Similar to Carrell, Raymond compared two groups of participants: a group that was taught five top level structure

strategies and a group that received no training. The strategies were: 1) description; 2) collection; 3) causation; 4) problem solution; and 5) comparison. These particular strategies were chosen because they occur frequently in the reading of prose. Participants were asked to read a text, complete a questionnaire, and then do a written recall (in English). Results revealed that after treatment, the experimental group outperformed the control group by recalling more idea units from one text. For a second text, there was a loss in the number of idea units from the pre- to the post-text. The author contributes this loss to the short time allotted for training the L2 readers. Nonetheless, the results revealed that structure strategy use is a characteristic of skilled second language readers. Finally, the author contends that more research needs to be conducted on the interaction of many different variables (text content, reader interest, text difficulty, and background knowledge) with L2 reading comprehension. She states that researchers need to examine more than the effects of particular strategy use on L2 reading.

In a study on the strategies used to comprehend and interpret L2 vivid phrasal idioms, Liontas (1999) reported that L2 readers use a variety of reading strategies to detect vivid phrasal (VP) idioms in written discourse. The strategies learners used included word and idiom recognition, lexical access and retrieval, contextual and pragmatic support, background and world knowledge, and formal schemata. These processes cannot be categorized as dichotomous constructs as the successful comprehenders used a combination of both local and global strategies. These findings suggest that if both global and local strategies are used simultaneously, the L2 learner will comprehend vivid phrasal idioms. The results echo Sarig's (1987) findings where global strategies used without local strategies did not lead to successful comprehension. An important distinction between the two studies is that Sarig's L2 participants were ESL learners, and Liontas utilized university L2 learners of Spanish, French and German. Furthermore, Liontas assessed the comprehension of VP idioms in addition to the comprehension of the authentic passages. Nonetheless, both these studies contribute to the notion that both bottom-up and top-down strategy use lead to successful L2 comprehension.

The subjects described in the L2 reading strategy investigations mentioned thus far have been quite diverse in terms of their proficiency level and language background, and consequently it is difficult to formulate generalizations. Because of the complex nature of L2 reading, another eminent point to consider is that most researchers have not examined gender as a variable in their studies. To date, only three studies have examined differences in comprehension strategies used by males and females while reading in a L2. Young and Oxford (1997) investigated the differences among 49 native English speaking men and women (26 females and 23 males) while reading two Spanish texts and one English text. The different passages were taken from textbooks used at the university-level courses of the participants and included topics such as economics, the presence of foreign cultures in work, leisure, and history. The subjects read the passages, rated their degree of familiarity with the passage topic, and then completed a think-aloud protocol. These strategies were then coded as either global or local. The local classification included strategies such as skipping specific unknown words, translating a word or a phrase, paraphrasing, and breaking lexical items into parts. The second rubric, global strategies, was similar to top-down processing behaviors such as integrating information, recognizing text structure, using background knowledge, and anticipating content (p. 55).

Results demonstrated no overall significant differences by gender in the use of global versus local strategies. However, there were significant gender differences in the frequency of use of specific strategies. Males monitored their reading pace and paraphrased more often than females with the Spanish passages. Females utilized one strategy more often than males while reading the texts: solve vocabulary problems. With regard to the recall scores, no significant differences by gender were reported for all three text topics, and furthermore, there were no reported differences by gender in the familiarity ratings with passage topics or background knowledge of any of the passages. Young and

Oxford's (1997) study revealed no significant differences by gender in general reading strategies, recall scores, and topic familiarity ratings while reading a L2 passage.

With 128 (78 females and 50 males) second year university-level male and female students of German, Schueller (1999) tested the effects of top-down and bottom-up reading strategies instruction on the comprehension of two different literary texts. To assess comprehension, she used both written recall and multiple choice questions. Overall, Schueller found a higher degree of reading comprehension among females. More specifically, she reported that every female group outperformed the male groups regardless of strategic training and comprehension assessment task with only one exception: only males with top-down strategy training did better than females on multiple choice (but not on recall). Schueller's study was the first to test whether males and females profit in similar ways from bottom-up and top-down strategy training, and her findings provide a strong basis for more research of this type. In light of the results, Schueller contended that if second language instructors do not have enough class time to teach both top-down and bottom-up strategies, they should focus on top-down strategy training because this will help both men and women.

In a study that examined the relationship between readers' gender, passage content, comprehension and strategy use, Brantmeier (2000) found no significant gender differences in the overall number of global and local strategies that subjects used to process the texts in the study. This study provided evidence that gender differences do not account for difference in strategy use when reading a second language. Results echoed Young and Oxford (1997) in that there were no differences by men and women in their strategy use. Before Brantmeier (2000), research typically examined the effects of culturally familiar and unfamiliar passage content on comprehension. No previous study had specifically examined how gender-oriented passage content affects strategy use in second language reading. Previous studies investigated the strategies readers use to process an L2 text, without considering the effects of passage content on strategy use (Anderson, 1991; Barnett 1988; Block, 1986, 1992; Carrell, 1989; Hosenfeld, 1977; Sarig, 1987). Some prior research (Olson et al., 1981) suggested that learners use different strategies to approach passages of different genre (i.e., narration vs. exposition), but again, this research did not directly examine the effects of passage content on strategy use.

Results of Brantmeier's (2000) study indicated no significant effects of gender-based content on local strategy use, but significant effects of gender-based content were found with global strategy use. The results of the effects of gender-oriented content on male/female strategy use demonstrated that when the passage content changed, processing behaviors changed only slightly. More specifically, males reported using more global strategies than females with the male-oriented passage, but the mean score was only slightly higher than that of the females (mean score of males = 4.7 and mean score of females = 3.7). Subjects reported using the same number of local strategies with the male-oriented passage. Males and females reported employing the same number of local and global strategies to process the female-oriented passage. These findings provide evidence that the strategies males and females used to process the male- and female-oriented passages changed only moderately by passage. Furthermore, the results indicated no positive correlation between subjects' global and local strategy use and their comprehension scores. It is difficult to support these results with prior studies because previous researchers who claimed that successful L2 readers use more global than local strategies determined proficient from less proficient readers in different ways (Block, 1992; Carrell, 1989; Hosenfeld, 1977).

Unlike Barnett's (1988) findings, subjects' strategy use (global and local) in Brantmeier's (2000) study did not affect comprehension. Brantmeier's (2000) results echo some of Sarigs' (1987) findings in that the use of global strategies led to both successful and unsuccessful reading comprehension. It is important to note, though, that in Brantmeier's (2000) study, while the type and number of strategies

used remained almost the same with both passages (more local than global strategies), the comprehension scores changed significantly.

Comprehension Measures in L2 Reading Strategy Research

As previously referenced, some L2 reading strategy research has connected strategy use to the measures of comprehension of the texts utilized in the study. Other investigations have connected strategy use to proficiency examination scores given before the experiment. A number of studies have not connected strategy use to comprehension at all. In Wolf's (1993) examination of the L2 reading process she stated, "In order to determine whether learners understand what they read, teachers and researchers must rely on learners' reconstructions of meaning on comprehension assessment tasks" (473). A major tenet of scientific inquiry is the data-collection instrument(s) created for the investigation. Different comprehension assessment tasks may not be testing the same ability, and therefore it is important to examine the tools used to measure comprehension in prior L2 strategy research. As stated earlier, measures of comprehension consist of free recall, summaries, multiple choice, true/false, close-deletion items, open-ended questions, and sentence completions. (See Table 2 for a summary of types of comprehension measures used or not used in L2 strategy research.)

Table 2. Comprehension Assessment in L2 Reading Strategy Research

Hosenfeld 1977	No comprehension measure of passages read in the study.
Block 1986	(1) Retellings (Students were asked to tell everything they remembered about the passage.) (2) Multiple Choice Tests (After retelling the passage, readers answered 20 written multiple-choice questions. They looked at the passage while answering these questions.)
Sarig 1987 (L1 and L2 study)	The readings were based on a problem-solving context. Comprehension was measured orally by: (1) main ideas analysis (2) synthesis of overall message
Barnett 1988	(1) Students read a story and wrote in English what they remembered of it. (2) Students read a story and chose the most likely phrase, sentence, or paragraph to continue it.
Carrell 1989	Written multiple-choice questions
Pritchard 1990	Oral retellings
Anderson 1991	(1) Written multiple-choice questions (2) Verbal reports of comprehension
Block	No comprehension measure for passages

1992	used in the study.
Raymond 1993	Written recall
Young and Oxford 1997	Oral recall protocols
Liontas 1999	(1) Think-aloud protocols (2) Oral Retellings
Schueller 1999	1) Written recall 2) Written Multiple choice questions
Brantmeier 2000	1) Written recall (2) Written multiple-choice questions

Conclusion

In the studies mentioned above the researchers used a variety of research methods with diverse populations to examine the reading strategies of second language learners. The subjects performed different tasks while reading texts that varied in type, length, content, and difficulty level. Each study reveals important information about the reading process and each investigation contributes to the database on L2 reading strategy use in its own unique way. Even though there were many diverse aspects to these investigations, the common thread is that most viewed successful readers as ones who used top-down strategies rather than bottom-up. Unfortunately, each researcher had a different set of criteria for distinguishing more successful and less successful readers, and some did not provide the criteria for categorizing more successful or less successful. Furthermore, some researchers predetermined the reading proficiency levels of the students and they did not examine the successful comprehension of the specific passages used in the study (Block, 1992; Hosenfeld,1977). Successful comprehension may be affected by the particular passages chosen for the studies and this information would be helpful when designing courses that include L2 reading. Furthermore, some studies did not connect the strategy use and type to successful comprehension. Lastly, it is important to note that most of the researchers only focused on one or two variables in the studies, such as proficiency level and text type, which may have affected strategy use and comprehension.

Suggestions for Future Research

The interactive nature of L2 reading, in and of itself, reveals the difficulty in designing studies that examine the L2 process as well as the complexity involved in formulating generalizations across L2 reading strategy studies. Both the nature of the sample and the setting within which a study takes place must be considered when thinking about generalizability. In the studies reviewed, populations of participants are assorted in that they are at various stages of acquisition in different target languages. Furthermore, researchers determine reading proficiency and comprehension levels in different ways. Generally speaking, in the United States the reading of lengthy, authentic texts in a second language begins at the high school and university levels. This detailed examination of some L2 reading strategy

studies conducted beyond the elementary level demonstrates the difficulty in making generalizations about L2 reading strategies.

It should be evident from this discussion that much important research remains to be done in this area. The referenced L2 reading strategies should be replicated. Repeating these studies with a new sample (but at the same level of L2 instruction) and under new conditions will add to the lacuna in the database of relevant investigations. Then, generalizations could be made based on a synthesis of relevant research done at each level of instruction. Once we gain a greater understanding of the L2 comprehension processes of readers beyond the elementary levels, we can begin to show students how to comprehend better. We can directly model the strategies that good readers use to comprehend their L2 reading materials. We can teach students how to be active L2 readers and the format we use for strategy instruction will be grounded in empirical research. Carrell, Pharis & Liberto (1989) and Liontas (1999) offer practical ideas about metacognitive strategy training for ESL and second/foreign language readers. These suggestions could be examined across languages and levels. Finally, more research on the most effective means for teaching L2 strategies to students at a range of instructional levels could be conducted.

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