# Reading Obstacles and Strategies from the Perspective of Schema Theory: A Case Study of Senior English Majors in Northwestern Polytechnical University

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*Abstract*—**Drawing on schema theory, this qualitative study explores reading obstacles English learners face, the causes of these obstacles and the reading strategies being used in reading. Three main themes emerged, which are a) reading obstacles encountered by English learners: reading obstacles of receiving visual information, reading obstacles of lacking non-visual information, reading obstacles of readers' subjective purpose and attitude; b) three causes of reading obstacle: lacking certain schemata, failing to activate prior schemata, possessing limited knowledge about reading strategies; c) the situation of reading strategies employed by English learners. On the basis of the findings, pedagogical implications for both English learners and EFL teacher are given at the end of the thesis.**

*Index Terms*—**Reading, reading obstacles, reading strategies, schema theory**

## I. INTRODUCTION

Reading ability is an incredible achievement for human beings. Viewing from the stance of college students, reading in English has been an ability that they must mastered. Moreover, reading is undoubtedly a very complex cognitive process. From the recognition of letters, words, phrases and sentences, to the judgment of logical relations and relevance between words, phrases, sentences and paragraphs, and then to the inference, assumption and confirmation of the meaning of the original text by using relevant background knowledge, this process is far more than the combination of literal meanings [1].

In recent years, many scholars have conducted in-depth research on English reading, putting forward several effective reading theories, such as psycholinguistic reading theory, interactive theory, cooperative learning theory, etc. [2]. However, despite of these studies, there are still millions of college students who can't read literary work or academic texts in English fluently when they graduate. Reading obstacles, namely, the obstacles of receiving visual information, the lack of non-visual information, and the obstacles in the subjective purpose, attitude and affection of readers still exist [3]. Drawing on schema theory, this study investigates the reading obstacles encountered by English learners of different proficiency in the process of reading, the causes of these obstacles and the reading strategies being used in reading. It hopes this study may help English learners

improve their English reading ability.

Theoretically, this paper hopes to further expand and enrich the relevant research on reading obstacles by investigating and studying English learners' reading obstacles with schema theory. Practically, the author hopes to systematically explore various reading obstacles and analyze the reading strategies of different English learners through schema theory, so as to help English learners clarify and overcome their reading obstacles, help them improve their reading efficiency and finally achieve the goal of *being to read* and *being pleasant to read*.

## II. LITERATURE REVIEW

### A. Schema and Schema Theory

Kant [4] first proposed the concept of "schema", believing that schema is the product of pure transcendental imagination. In 1932, Bartlett first introduced the concept of schema into the field of psychology and proposed schema theory, describing schema as "a positive development mode". He believes that schema is a process in which information stored in the reader's brain acts on new information and a process that the reader absorbs new information. Rumelhart [5] believes that schema is a group of "interactive knowledge structures" or "blocks of building cognitive ability" stored in long-term memory in hierarchical form. These blocks represent knowledge at various abstract levels. The reader's understanding of the information in the input material depends on whether he or she has relevant background knowledge and can activate the knowledge in time. Once the corresponding schema is activated, it can guide the reader to speed up the understanding process. Later, Carrell and Eisterhold [6] define this theory as "the theory about the role of background knowledge in language understanding". Specifically, in terms of reading, this kind of exposition of readers' use of schema for language understanding and text interpretation is schema theory [1].

### B. Classifications of Schema

#### 1) Language schema

Language schema is closely related to linguistic proficiency [6], which refers to the knowledge concerning vocabulary, grammar, syntax etc. For foreign language learners, reading is not only concerning about language ability, but also about reading skills. Foreign language competence is the "threshold" of foreign language reading. Only when we overcome and cross the "threshold", can we transfer native language reading competence to foreign language reading. And the level of the threshold depends on

the purpose of reading as well as the difficulty of the reading materials.

*2) Content schema*

Content schema refers to "background knowledge of the content area of a text" [6]. The more content schemata readers have, the stronger their reading comprehension ability, information storage ability and recall ability will be [7]. If the reader lacks or fails to activate relevant background knowledge of an article or a segment of a reading material during reading, it may be difficult to interact with the reading materials even without vocabulary, syntax and other obstacles, which results in the failure to start the corresponding "content schema" to predict the content and theme of the article.

*3) Formal schema*

Formal schema refers to "background knowledge of the formal, rhetorical organizational structures of different types of texts" [3]. In other word, it is the knowledge about the rhetorical structure of various articles, such as differences in genre, differences in the structure of methods, simple stories, scientific texts, and so forth. And authors use these methods to organize the content or various concepts in the text and make them interact with each other, so as to transmit the information to the readers. Different genres of text have their own unique structure, and readers' original knowledge of the structure of the article genre can be of help to understand the content of the article.

## III. METHODOLOGY

### A. Research Design

This research is conducted through qualitative method, guided by the following two questions:

(1) What are the reading obstacles encountered by English learners?

(2) What are the causes of these reading obstacles and strategies used by different English learners?

### B. Research Context and Participants

This study takes senior students of English major from NPU as the research subjects. They are of the same cultural background, speaking Chinese as L1 and English as L2. Totally, there are four participants, one for pilot study and three for main study. During the researching process, participants are interviewed in Chinese. Three interviewees in main study are selected from the three ranges of TEM-4 (above 80, 70–79, 60–69).

### C. Research Instrument: Interview

Interview is a research method for researchers to collect (or construct) first-hand data from the subjects through oral conversation [8]. Through interview, people can express their thoughts and build up certain mutual understandings. To deeply investigate reading obstacles encountered by English learners of different proficiency, interview is an appropriate and available method.

### D. Preliminary Study

In order to ensure the effect of the whole process of interview and verify feasibility of interview questions, one pilot study is conducted preliminarily.

*1) Pilot reading materials and interview questions*

The two reading materials are from TOEFL (Test of English as a Foreign Language) and GRE General (Graduate Record Examination General). In the beginning, the reading materials were selected without reserving the exercises. However, it was found that the participant was easy to be at a loss if he was directly told to read and then to be interviewed. As a result, exercises are added in the final version of reading materials.

As for interview questions, the first version was set with 24 questions in total based on two master's theses by Guo [9]. According to the result of the pilot study, questions were found to contain certain bias.

*2) Transcribing video recordings and analyzing data*

Before analyzing the data, I listened to the recording carefully and transcribed every sentence verbatim. Every word was directly transcribed without any notes or symbols, which caused great difficulty for retrieving codes effectively during analyzing.

*3) Revising interview questions & modifying data collection procedures*

At first, there were questions that has little relevance with the research, and they were removed in the second version. And some expression problems were reorganized so that the statements could be more concise and formal.

After revising, the data collection procedures were also modified. Before the interview, participants need to read two pieces of passages, finish the exercises as much as they can within 30 minutes, and then be interviewed. There are 15 open-ended questions in this interview and there is no right or wrong answer. The interview will be extended with the subjects in a relaxing and quiet atmosphere. Interviewees need to answer questions sincerely and express their obstacles in the process of reading. For the convenience of analyzing, interviews are audio recorded.

### E. The main study

Based on the experience and result of the pilot study, the main study was conducted more smoothly. Following is the description of the process of data collection after revising as well as the data analysis.

*1) Data collection*

For considering the ethical facet, a consent form was given to every participant ahead of the interview. In the form, participants were informed of the purpose of this research and that if they were not interested in being involved in the study, they were fully endowed the right not to participate. Meanwhile, it was guaranteed that the data collected from them would be only used for the research purpose, and all their identities would be marked anonymously and would not be disclosed.

Three interviews were all finished smoothly, and a certain amount of effective data were obtained. The main study still adopts interview as the instrument. After preparing interview questions, I firstly scheduled with participants and checked the appropriate (quiet and comfortable) place before interviewing. Secondly, participants started reading and finishing exercises attached behind reading materials after my introductory remarks. Then, the interviews together with the audio records began. Finally, ending remarks and gratitude were extended after interviewing, which signaled

the end of the interview.

Learning from the experience of pilot study, it was found that the participant was easy to be at a loss if he was directly told to read the materials and then to be interviewed. To obtain a better interview efficiency, exercises are added in the reading materials of final version. And exercises of two pieces of passages are all multiple choices.

The interviews are all audio recorded, which started after participants finished their reading and exercises, and stopped after they gave their answers to the last question of the interview. Every recording from interviews was transcribed verbatim. Differently, some transcription symbols were adopted for the researcher to analyze data more conveniently.

*2) Data analysis*

In order to analyze the data more logically and distinctly, Braun and Clarke's [10] thematic analysis approach were adopted as the analytical method, which is a widely utilized foundational methods for qualitative analysis. It is a method for identifying, analyzing and reporting patterns (themes) within data, which emphasizes on the clarity and vitality of process. It "minimally organizes and describes data set in (rich) detail" [9]. The six phases are presented and illustrated as below.

**Phase 1: Familiarizing myself with the data.** As the interviewer, I have had certain prior impression and knowledge of the data. During transcribing, I immersed myself in it, and developed a far more thorough understanding of the depth and breadth of the data. Moreover, I spent more time checking the transcriptions back against the original audio recordings to ensure "accuracy", which also helped me familiarize with the data.

**Phase 2: Generating initial codes.** In this phase, coding various features of the data is of primary position, because codes can identify features of the data, either semantically or latently. Here, codes refer to the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon.

**Phase 3: Searching for themes.** While phase 2 makes sense from the detailed respect, phase 3 bases on the codes generated in phase 2 and re-focuses the analysis at the broader level of themes. It sorts different codes into potential themes and collates relevant coded data extracts within the identified themes.

**Phase 4: Reviewing themes.** During this phase, to check whether the themes set in phase 3 are relevant to the coded extracts is necessary. After checking, if the candidate theme fails to fit, then a new theme needs to be created. In the course of theme reviewing, some codes that are overlapped within the same theme or some others that are mistakenly put in the temporary theme are adjusted timely.

**Phase 5: Defining and naming themes.** After identifying the overall and specific contents of every theme, it is vital to analyze and organize the "story" of every theme, and then describe themes depending on their own scopes and contents in a couple of words or sentences.

**Phase 6: Producing the report.** In this phase, it is necessary to select a set of vivid and compelling examples, together with analysis of selected extracts based on the worked-out themes. Moreover, the report needs to relate back of the analysis to the research question. comprehension and the place where readers first encounter obstacles.

## IV. FINDINGS AND DISCUSSION

The interview data suggests that reading obstacles are not non-existent or groundless, and various strategies are applied by English learners of different proficiency to acquire a better understanding on reading materials.

### A. Reading Obstacles Encountered by English Learners

#### 1) Reading obstacles of receiving visual information

According to the three sets of data, interviewees have mentioned many obstacles concerning about receiving visual information they have encountered during reading the two passages (see extract 1, 2). Here, the visual information is a kind of text symbol printed on paper, which can be seen directly by eyes. It includes letters, words, sentences and other language forms. Acquiring visual information is the understanding of language form and its literal meaning, which is the premise of further understanding combined with non-visual information.

**Extract 1**
**S1:** When reading the second passage…there are a lot of clauses, parentheses, and pronouns, such as "it", which results in slow reading speed.

**Extract 2**
**S3:** There are many long sentences in the second chapter. After reading a long sentence, I have to review it for many times before clarifying the author's ideas in combination with the contexts.

For one thing, all interviewees mentioned the obstacle caused by long and complicated sentences in the second passage. Due to the distinct pragmatic use between English and Chinese, they could not fix what a pronoun refers to exactly if there are many pronouns in one sentence at the same time, or eliminate the interference of various parentheses during reading. All interviewees are confident with their grammar referring to the short sentences, it is interesting to find that they do not consciously relate the obstacle on understanding long sentence to the matter of grammar, however, which does concern with the facet of grammar. Honestly, it comes down to the fact that they fail to activate certain language schema in their brain.

For another, when asked about the influence of new words or ambiguous words on understanding two passages, the data is a little bit different from person to person (see extract 3, 4). Interviewees at middle and high level give similar ideas that new words are actually not accounted as an obstacle during their reading. Not only because there are not so many new words in the two passages, but they are used to inferring or guessing the meaning of new words they meet from the context. While the interviewee at a relatively lower level of English says that the extent of the impact is about 40%, which is quite large according to her words. For her, it is because there is limited knowledge about words in her brain. In other words, she lacks certain language schema to assist her comprehension. Also, it seems that she fails to utilize the guessing strategy to help her when her reading process is impeded, or her knowledge about various strategies is not enough to support her reading. Actually, as the basic unit of sentences, words do matter.

**Extract 3**
**S2:** I think the degree of the influence of new words is about at least 40%, almost half. In fact, the degree is quite large for me. In fact, it's OK to have one or two occasionally, but if they appear densely within a paragraph, the impact might be quite huge.

**Extract 4**
**S3:** I think new words and ambiguous words have a great impact, but a considerable part of their meanings can be guessed through contexts. Therefore, it is not counted as a serious obstacle for understanding the passage.

*2) Reading obstacles of lacking non-visual information*

Non-visual information mainly includes the understanding of the language used in the reading material, the understanding of the topic and so on so forth. Smith (1978) considers it as all kinds of knowledge accumulated by readers in their study, work and life, which is stored in people's long-term memory.

From daily experiences, we often find that sometimes even if we have understood every word and sentence of the reading material, it is still difficult for us to comprehend the whole text. In this case, non-visual information is of great importance in reading. On the one hand, the more non-visual information one has, the less dependent the reader is on the visual information, and the easier it is to understand the passage. When reading first material whose topic is American women, three interviewees have mentioned that they are familiar with it, which shortens the time of comprehension and information acquisition. While as for the second reading material whose topic is about rhetoric, two of the three interviewees have not heard about it before, which makes it harder to comprehend (see extract 5, 6). Based on this, they concluded that familiar topic can be of positive effect for them to comprehend reading materials.

**Extract 5**
**S2:** I don't know much about the second one. The first one is about women's contribution. Nowadays, there are many people discussing feminism, and thus I have seen and learned something about it.

**Extract 6**
**S3:** I am familiar with the first passage about American history, but I am not familiar with the second one. If I come across a familiar topic, I can read it more quickly, because sometimes I don't need to go back to the original text to find the details.

However, on the other hand, the background knowledge may not always be of positive value. If the information introduced in the text is inconsistent with the knowledge readers have already stored in mind, it may be an impediment for comprehension. According to interviewees, it is easy to conclude that the previous knowledge has great impact on their reading. They know consciously that the text should come first, but it is not easy to avoid thinking inertia. Consequently, it takes extra but unnecessary time for them to firstly doubt themselves and then rectify to the "right road", which will more or less affect reading efficiency.

Moreover, when asked about whether genres and structures of reading materials affect the readers' understanding, interviewees of different levels agree that the answer is yes (see extract 7, 8). They think they can concentrate on different parts of contents according to different types of reading materials, and a clear structure is definitely helpful for comprehending the passage and finishing the exercise. However, differentiating from words and sentences, English learners at middle and lower level are seemingly not used to dividing the structure of passages consciously while doing exercises, unless there are transitional words obviously indicating the order or structure of reading materials, such as firstly, secondly and so on.

**Extract 7**
**S2:** Generally, I can clearly distinguish different genres of reading materials…I think... It (the structure) might be helpful. For example, there are some articles that may start with reasons, then talk about the process and finally the results. This is very explicit and clear, and it is useful for positioning or understanding.

**Extract 8**
**S3:** Yes, I can. Because I have been learning about these for many years, and they are also learnt on Chinese classes, so it's quite easy for me to distinguish different genres. To some extent, the structure of the article will make it easier for me to sort out the logical chain of the whole passage.

*3) Reading obstacles of readers' subjective purpose and attitude*

In addition to the visual and non-visual information, we can't ignore the influence of the subjective factors such as the readers' purpose and attitude on the reading comprehension. Aimless reading does not exist. Everyone has his own potential or definite purpose in reading. And interviewees mentioned contents that are exactly related to reading purposes when they refer to their reading strategies (see extract 9, 10). For instance, when they want to judge the main idea of the article, they need to use the strategy of skimming. To answer specific questions about details, they need to use the strategy of scanning. Reading without a certain purpose is like shooting an arrow without aiming at the target. What's more, there are some other obstacles. All interviewees hold the view that the second passage is more difficult, academic and logical. Also, one interviewee has mentioned an obstacle about the number of choices. Usually, the number of multiple choices in Chinese exams is four, while the second passage from GRE owns five, which makes him not accustomed. And these arouse a negative attitude and anxious affection of reading as well as doing exercise.

**Extract 9**
**S1:** The scope of exercises in the first passage is very narrow. For example, in this question, the description of the question directly points out the paragraph from which to find the answer, or indicates the specific line of the word, so the scope is very accurate.

**Extract 10**
**S2:** My steps for finishing reading exercises are: firstly, read the title; next, confirm the type of exercises and key words in the description lines; then, mark certain relevant parts in the article during reading, so as to facilitate the accomplishment of follow-up exercises.

*B. The Causes of Reading Obstacles*

*1) Lacking certain schemata*

According to the data, the most obvious reason that can be concluded is that English learners lack certain schemata. Simply obtaining visual or non-visual information is not equal to understanding. In reading, the purpose of schema is to represent, analyze, reason and integrate the reading content effectively and efficiently with its unique way of thinking or cognition. However, if the brain does not even store the relevant schema, the information in the passage can't be connected with the knowledge in one's brain.

*2) Failing to activate prior schemata*

According to the data, English learners do own the knowledge of grammar. However, they still come across the reading obstacle. The reason is that the structure of long sentences is different in simple sentences they have learned before, and therefore, they fail to remind themselves of certain schema to comprehend reading materials.

The prior knowledge exists as various interrelated schemata in the cognitive structure, so the existing information base in thinking plays a guiding role in reading comprehension through schemata. To truly understand a paragraph actually means to activate an appropriate schema and fill the input information one by one into the information slot of the schema. If all the information is in its proper place, we will get a comprehensive understanding.

*3) Possessing limited knowledge about reading strategies*

Although I have briefly introduced the key term of reading strategies to interviewees, it seems that there are two distinct problems that are urgently needed to be clarified. Firstly, few English learners know exactly what reading strategies are and what reading strategies they have used. Secondly, they do not know how to use reading strategies consciously except for very few skills.

*C. The Situation of Reading Strategies Employed by English Learners*

Generally, participants have mentioned reading strategies such as activating prior knowledge, connecting the text with background knowledge, taking steps to repair misunderstanding (through, for example, pausing to check), rereading, taking notes, paraphrasing, underlining or highlighting, using graphic organizers. Viewing from the situation on the whole, English learners turn to use typical support strategies and typical monitoring reading strategies more, instead of typical global reading strategies. To explore further, it is because English learners are accustomed to doing task-based reading. They are often driven by exercises and used to focusing more on specific points of reading materials when reading, rather than grasping the text from the whole. Moreover, it seems that the interviewee with high language proficiency incline to use various strategies, and he uses more than those with lower language proficiency. Also, strategies they consciously use and mention can only be counted as a small part in the field of reading strategies. There are still quite a number of strategies used by them but not regarded as strategies in their eyes.

## V. PEDAGOGICAL IMPLICATIONS

*A. For English Learners*

*1) Measures to deal with receiving visual information*

Knowledge concerning about the language itself is the most basic thing that students should keep on learning and remembering. One is impossible to activate and retrieve anything if not storing enough knowledge as schema in brains. Therefore, for people who lack language schema, the primary thing they need to do is to enrich relevant knowledge, and form their own schema. Besides, the ability of utilizing strategies is also important. Taking vocabulary as an example, it is inevitable to meet unknown words during reading. Readers should try to train the strategy of guessing words by the aid of word formation, the logic relationship of context and so on.

*2) Measures to deal with the lacking non-visual information*

As mentioned previously, effective reading comprehension is the process of interaction between the background knowledge and reading materials. A lack of relevant content schema may cause both reading obstacles and communicative obstacles. Therefore, English learners need to firstly increase the input of background knowledge. Moreover, cultivating the ability of predicting and linking with original schema is also very helpful, because one of the functions of schema is to help readers predict and judge. Therefore, English learners are advised to predict according to titles, subtitles and key words. After predicting, students may also be eager to check whether their prediction is true or not.

*3) Measures to deal with readers' subjective purpose, attitude and affection*

It is absolutely not that reading is just for the sake of finishing examinations. Only when the reading purpose is clear enough, can the reading efficiency be high, and then the reading is meaningful. What's more, there is a famous sentence saying that interest is the best teacher. English learners should try to fall in love with reading, and find the specific points that the reading does attract them. Then read as much as they can happily and consciously, widely and quickly, in order to enhance their motivation to learn English, so as to improve the ability of English reading.

*B. For EFL Teachers*

*1) Introduce to students what reading strategies are*

It is clear and consistent on the fact that explicit teaching of strategies can be very effective in promoting efficient reading and comprehension [11]. Therefore, EFL teachers should introduce to students what is reading strategy, that is, a clear definition of reading strategy. Besides, what categorizations or types of reading strategies are often used in the reading process is also necessary to be introduced, such as global strategies, monitoring strategies, reading support strategies etc.

*2) Cultivate students' awareness of using reading strategies*

Maybe some students know exactly what reading strategies are and what reading strategies there are, they often still fail to think of using strategies in reading. Therefore, EFL teachers should not only integrate reading strategies teaching with language teaching tasks, but also teach students how to use them consciously and effectively. And it may be of great help to cultivate students' awareness of using reading strategies before reading and remind them to use reading strategies while reading.

## VI. CONCLUSION

This study explores the reading obstacles encountered by English learners of different levels in the process of reading, the causes of these obstacles and the reading strategies being used in reading. Firstly, English learners of different levels inevitably encounter with some obstacles of receiving visual information caused by new words, long and complicated sentences and so on while reading. As the premise for further understanding, language schema does matter. Secondly, reading materials are not the simple piling up of words and sentences, but the invisible container of contents and knowledge. English learners should deliver more concentration on such kind of non-visual information, and constructing and forming various and diverse content and formal schemata can be of great importance. Thirdly, while paying attention to the objective factors that influence reading, subjective facets also play an important role in reading obstacles, which are usually imperceptible. Without a clear purpose, the reading will be meaningless. Also, reading with a negative attitude might cause low efficiency.

The present study still has limitations. This study is a small-scale qualitative case study, and the results have relatively low generalizability which can only be applied to a very narrow population or in a very specific situation. In the future, researchers can combine qualitative research together with quantitative research, so that the data and results could be more persuasive.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## AUTHOR CONTRIBUTIONS

Yuting Zhang conducted the research and wrote the paper; Junhong Dong offered many suggestions and helped revise the paper.

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