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Reading strategy use and reading proficiency of EFL students in China

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The purpose of this study was to explore the relationship between reading strategy use and reading proficiency among Chinese university students of English as a foreign language. Participants were 241 students at two universities in northwest China. Strategy use was measured utilizing Mohktari and Sheorey's (2002) *Survey of Reading Strategies* (SORS). Data analysis was conducted using bivariate correlation and multiple regression analysis. Participants reported being moderately active users of all three types of reading strategies measured by the SORS (global, problem-solving, and support strategies), with problem-solving strategies being the most preferred and support strategies the least preferred. Study results provided evidence that a significant relationship exists between reading strategy use and reading proficiency. Results of the multiple regression analysis revealed that (a) problem-solving strategies and global strategies are predictive of reading proficiency score among the study population, and (b) support strategy use is negatively correlated with reading proficiency score. Study findings add support to previous research that has demonstrated a linkage between reading strategy use and reading proficiency, while also revealing the need for future investigations into the complex interaction between reading strategy use and reading proficiency among university students in China.

Keywords: reading strategies; reading proficiency; China; university students

Introduction

Since the mid-1970s second language acquisition scholars have explored the topic of individual variation in the acquisition of English as a second or foreign language, examining the impact of a wide variety of cognitive, affective, and sociocultural variables. Early investigations were focused on identifying commonalities among successful language learners in an attempt to make recommendations for students and their teachers. For example, Rubin (1975) explored the language learning behaviours of successful students and compiled a list of seven strategies common to "the good language learner". This list included actions and attributes such as being a willing and accurate guesser, having a strong desire to communicate, being uninhibited, and attending to both form and meaning. Stern (1975) presented a similar compilation, adding an emphasis on thinking in the target language and using the L2 for communication. These preliminary studies raised awareness among researchers and educators that learners do indeed use specific strategies as they acquire and refine their skills in a new language and that these strategies can be identified and classified (O'Malley, Chamot, Stewner-Manzanares, Russo, & Küpper, 1985).

Ultimately, these early contributions and some cornerstone works that quickly followed (e.g., Naiman, Frohlich, Stern, & Todesco, 1978; O'Malley et al., 1985; Oxford, 1990; Oxford & Nyikos, 1989; Rubin & Thompson, 1982) also provided the impetus for an entire new strand of research that addressed the nature of learning strategies and their role in second language acquisition worldwide. Much of the research

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on language learning strategies was based on the strategy framework designed by Rebecca Oxford (1990) and the accompanying instrument, the *Strategy Inventory for Language Learning* (SILL). In recent years, researchers have built upon the foundation laid in the area of general learning strategy research by examining strategy use in specific skill areas, including reading.

For a little more than a decade, researchers have examined the types of reading strategies used by learners of English as a second or foreign language (ESL/EFL). Most of this research has drawn on the work of Mokhtari and Sheorey, who developed the *Survey of Reading Strategies*, or SORS (2002). A number of studies (e.g., Huang & Nisbet, 2014; Madhumathi & Ghosh, 2012; Sheorey & Baboczky, 2008; Sheorey, Kamimura, & Freiermuth, 2008) have explored the reading strategy preferences of learners at different proficiency levels, and findings have generally shown that learners at higher levels of proficiency tend to use more strategies than those at lower proficiency levels. To date, however, little research has been conducted to directly examine the predictive relationship between reading strategy use and reading proficiency, and no such investigations have been conducted in China. This is surprising, particularly in light of the large population of English language learners in Chinese universities (Poole, 2005). The current study was designed to address this gap in the literature through an exploration of reading strategy use and reading proficiency among Chinese university students of EFL. Findings from this investigation could potentially provide valuable information for researchers and practitioners interested in enhancing the effectiveness of English instruction in China.

Literature review

Language learning strategies

Broadly speaking, reading strategies are language learning strategies. Language learning strategies can be described as specific actions or tactics on the part of individual learners that facilitate the acquisition of a second or foreign language (Chamot & O'Malley, 1996; Cohen, 1998; Oxford, 1990). As defined by Griffiths (2008), they are "activities consciously chosen by learners for the purpose of regulating their own language learning" (p. 87). When effectively employed and coordinated, language learning strategies can be beneficial tools for enhancing student performance on a wide range of both receptive and productive language tasks (Cohen & Macaro, 2007; Griffiths, 2008; Oxford & Burry-Stock, 1995; Vann & Abraham, 1990).

Research findings over the past four decades have indicated a significant linkage between strategy use and success in language learning (Cohen & Macaro, 2007; Oxford, 2011). Much of the research in this area has been based on Rebecca Oxford's (1990) strategy taxonomy and the SILL, which identifies six categories of strategies (memory, cognitive, compensation, metacognitive, affective, and social). Numerous studies have examined the relationship between language learning strategy use (as measured by the SILL) and English proficiency in a variety of ESL and EFL settings in different cultural contexts worldwide, and results have consistently demonstrated a significant positive correlation (Oxford, 2011; Oxford & Burry-Stock, 1995). Notable in the context of the current study is the fact that relationships have been shown to exist between strategy use and proficiency in specific skill areas, including speaking, listening, reading, writing, and vocabulary learning (Cohen & Macaro, 2007; Griffiths, 2008).

Language learning strategies and reading

In recent years, increased attention has been given to ESL/EFL students' strategy use in the area of reading (Madhumathi & Ghosh, 2012). Building upon a substantial body of knowledge regarding the critical role of metacognition in L1 and L2 reading (e.g., Anderson, 1999; Anderson, 2005; Auerbach & Paxton, 1997; Carrell, 1989), researchers have begun to examine the nature and role of metacognitive strategy use in reading among learners of ESL/EFL.

In 2002, Mokhtari and Reichard developed a reading strategies inventory to assess metacognitive awareness and perceived use of reading strategies among adolescent and adult learners. This instrument was validated for use with native English speakers. Later that same year, Mokhtari and Sheorey (2002) created a similar instrument, the *Survey of Reading Strategies* (SORS) for use with learners of ESL/EFL. Mohktari and Sheorey's SORS (2002) has been utilized in a number of studies (e.g., Huang & Nisbet, 2014; Madhumathi & Ghosh, 2012; Poole, 2005, 2009; Sheorey & Baboczky, 2008; Sheorey et al., 2008) to examine metacognitive strategy use among learners of English in both second and foreign language contexts over the past decade. As described by the authors, this instrument measures three broad categories of strategies (global, problem solving, and support strategies) that learners "perceive they use while reading academic materials in English" (p. 4). Mokhtari and Sheorey (2002) define the three types of reading strategies as follows. Global strategies are "intentional, carefully planned techniques by which learners monitor or manage their reading" (p. 4). Strategies such as making predictions while reading or critically analysing the overall content of a text fall under this category. Problem-solving strategies are "actions and procedures that readers use while working directly with the text; these are localized, focused techniques for use when problems develop in understanding textual information" (p. 4). Examples include adjusting reading speed based on the difficulty level of a text, or using context clues to guess the meaning of unknown words. Finally, support strategies are "basic support mechanisms intended to aid the reader in comprehending the text, such as using a dictionary, taking notes, underlining, or highlighting textual information" (p. 4).

Findings from multiple studies involving the SORS have revealed a positive relationship between reading proficiency and reading strategy use, with learners at higher proficiency levels tending to use more reading strategies, as well as a wider variety of strategies, than those at lower proficiency levels (e.g., Huang & Nisbet, 2014; Madhumathi & Ghosh, 2012; Sheorey & Baboczky, 2008; Sheorey et al., 2008). In addition, there is evidence that reading strategy use varies by gender, with females tending to use more strategies than males (e.g., Madhumathi & Ghosh, 2012; Poole, 2005, 2009; Sheorey & Baboczky, 2008). Finally, findings from these studies have revealed variances in reading strategy preferences among learners in different learning contexts (ESL vs. EFL) and among learners from different cultures (Anderson, 2003; Zheng & Kang, 2014).

The current study extends this line of research by exploring the relationship between reading strategy use and reading proficiency among university students of EFL in China. While some previous studies have utilized the SORS to measure strategy use patterns (i.e., frequency and type of strategy use) among Chinese university students (e.g., Poole, 2005; Xu, 2007; Zheng & Kang, 2014), none of these studies has concurrently examined the relationship between reading strategy use and reading proficiency. The current study was designed to address this gap in the literature and provide added perspective on the strategy use patterns among Chinese university students.

In regard to frequency and patterns of strategy use, findings from previous SORS studies conducted with Chinese university students (Poole, 2005; Xu, 2007; Zheng & Kang, 2014) have revealed that (a) Chinese university students report using reading strategies at a moderate to high level; and (b) they tend to prefer global and problem-solving strategies over support strategies. In terms of the exact order of preference between global strategies and problem-solving strategies, findings from the aforementioned studies were mixed. Two studies (Poole, 2005; Zheng & Kang, 2014) revealed that students report using problem-solving strategies the most, whereas one study (Xu, 2007) showed that students report a strong preference for global strategies, with problem-solving strategies ranking second.

The current study was designed to expand the research in this important area by examining not only the frequency and patterns of strategy use among Chinese university students, but also the relationship between reading strategy use and reading proficiency. Our investigation was guided by the following research questions:

1. Which categories of reading strategies do participants use most frequently, as measured by self-report data from the SORS?
2. What are the relationships among three categories of reading strategies (global, problem-solving, and support) and reading proficiency?
3. Which categories of reading strategies are predictive of reading proficiency score?

Study outcomes will provide needed information for practitioners and researchers interested in fostering reading proficiency among this population.

Methodology

Participants

A non-random sample of 241 university students majoring in EFL from two universities in a northwest province of China participated in this study. Students were invited to participate in the study voluntarily. They were assured that their decision to participate would not in any way affect their academics, and that all information would be anonymous and confidential. The majority of participants were third-year students (81%). Nine percent of participants were second-year students, and 6% were either fourth year or graduate students at the time of the investigation. Three percent of participants did not identify their year. In regard to gender, the study population was comprised of 222 females (92%) and 19 males (8%). The majority of the participants (78%) were in an English education track, while the rest were English majors enrolled in a non-education track. The ages of the participants ranged from 18 to 25, with a mean age of 22.

Universities in China are categorized as First, Second, and Third Tier Universities, with the tiers referring to the order in which universities enrol students after the College Entrance Examination. First Tier Universities begin the enrolment process first and thus are able to select students with the highest scores. Second Tier Universities follow, and so on. One of the two participating universities was a First Tier University (N = 125) and the other a Second Tier University (N = 116).

Instrumentation

This study examined the variables of reading strategy use and English reading proficiency through scores generated from two instruments: (a) the Survey of Reading Strategies (SORS) and (b) the Reading Comprehension section of the Test of English as a Foreign Language (TOEFL).

English reading proficiency was measured using scores from the Reading Comprehension section of a practice TOEFL (ETS, 2003). The TOEFL is used to evaluate the English proficiency of individuals whose native language is not English. Universities in the United States of America and Canada, as well as other countries require TOEFL scores of applicants who are non-native speakers of English. For the purpose of this study, the Reading Comprehension section of Practice Test A (ETS, 2003) was used to measure the reading proficiency of the participants. The test contains five reading passages and 50 comprehension questions, and scores on this instrument can range from 0 to 50.

Reading strategy use was measured using the SORS, developed by Mokhtari and Sheorey (2002). The SORS contains 30 likert-scale items, and it generates a measure of overall reading strategy use, as well as scores on three subscales: Global Reading Strategies, Problem-Solving Reading Strategies, and Support Reading Strategies. As reported by the instrument's authors, the internal estimate of reliability for the scale using Cronbach's coefficient alpha was .89; and the instrument is valid and reliable for use with adolescent and adult non-native speakers of English. See Mokhtari and Sheorey (2002) and Sheorey and Mokhtari (2001) for additional information on the development and validation of the SORS. The instrument, along with its scoring guide, is available as a free download at http://laurenyal.myefolio.com/Uploads/Survey2002Mokhtari.pdf.

Procedures

Participants were asked to complete the SORS and the Reading Comprehension section of a practice TOEFL. They were also asked to provide demographic data (e.g., gender, age, major/track, year of study, etc.) on an information sheet. No identifying information such as names, phone numbers, or email addresses was collected. None of the English teachers of these participants were present during the administration of the survey and test, thus reducing the chances that participants might be predisposed to respond in a certain way to please their teachers. All data was collected by one of the researchers, who is not affiliated with either research site.

The SORS and the information sheet were administered first, followed by the reading comprehension section of the TOEFL. Participants took approximately 10 minutes to complete the SORS and the information sheet. They were then given 55 minutes to complete the reading comprehension section of the practice TOEFL, in accordance with the directions given on the TOEFL.

Data analysis

Descriptive statistics, including means and standard deviations, were computed in order to identify which category of strategies students reported using most frequently. Paired sample *t* tests were used to examine whether or not the strategy preference was due to random error. Pearson correlation coefficients were calculated to determine the strength of the linear relationship among the three categories of reading strategies (global, problem-solving, and support) and reading proficiency. Finally, a multiple regression analysis was conducted to determine which reading strategy categories were more predictive of reading proficiency as measured by the reading comprehension section of the TOEFL.

Results

The first research question concerned the frequency of strategy use. According to Mokhtari and Sheorey (2002), a mean score of 3.5 or higher is deemed as high use of strategies, and a mean score of 2.5 to 3.49 is considered medium use. Descriptive statistics revealed that overall strategy use was in the medium range (M=3.29, SD = .45). Students favoured problem-solving strategies the most (M=3.45, SD = .53), followed by global strategies (M=3.31, SD = .55). Their least-used strategies were support strategies (M=3.12, SD = .50).

Paired sample *t* tests comparing the adjacent strategy means (see Table 1) revealed significant differences among the three strategy categories. The mean use of problem-solving strategies was significantly higher than the mean use of global strategies and support reading strategies, and the mean use of global strategies was significantly higher than that of support strategies. To avoid Type I error with repeated *t* tests, the Significance Level was changed from .05 to .017 (.017 was determined by dividing .05 by 3, the number of *t* tests conducted) (Green & Salkind, 2011). The results indicated that the *p* value was smaller than the Significance Level ($p = .000$).

Table 1. Descriptive statistics for the strategy categories and paired sample t-tests for mean difference between the three strategy categories (N = 241)

Strategy Categories	Mean	Rank	S. D.	Min.	Max.	Paired *t*-test	*t*
PROB	3.45	1	.53	1.57	4.86	GLOB - PROB	-4.46**
GLOB	3.31	2	.69	1.62	4.77	GLOB - SUP	6.10**
SUP	3.12	3	.71	1.44	4.56	PROB - SUP	10.45**

**p =.000 GLOB = Global Reading Strategies, PROB = Problem-Solving Strategies, SUP = Support Strategies

The second research question pertained to the relationship between the use of reading strategy categories and reading proficiency scores. The Pearson correlation coefficient for the relationship between problem-solving strategies and reading proficiency was significant ($r(241) = .237$, $p < .001$), indicating a positive relationship; students with higher reading proficiency tended to use more problem-solving strategies. The Pearson correlation coefficient for the relationship between global strategies and reading proficiency was also significant ($r(241) = .189$, $p = .003$), indicating a positive but weak relationship, with students at higher reading proficiency levels tending to use slightly more global strategies. The Pearson correlation coefficient for the relationship between support strategies and reading proficiency was not significant. Table 2 shows the bivariate and partial correlations of the strategy categories with the TOEFL reading score. The bivariate correlation measures the relationship between two variables, while the partial correlation is the correlation between two variables after controlling for all other predictors.

Table 2. The bivariate and partial correlations of the strategy categories with the TOEFL reading score

Strategy Categories	Bivariate Correlation	Partial Correlation
PROB	.237**	.22**
GLOB	.189**	.15*
SUP	.009	-.21**

**p <.001 (two tailed), * p <.05 (two tailed) GLOB = Global Reading Strategies, PROB = Problem-Solving Strategies, SUP = Support Strategies

To address the research question regarding the predictive relationship among reading strategy scores and reading proficiency score, a multiple regression analysis was conducted. The predictors were the three strategy categories of global, problem-solving, and support strategies, while the criterion variable was the TOEFL reading proficiency score. The multiple regression analysis indicated that the linear combination of the three strategies was significantly related to TOEFL Reading Comprehension score, F (3, 237) = 9.10, $p < .001$. The squared multiple correlation R^2 was .10, indicating that 10% of the TOEFL reading score in the sample can be accounted for by its linear relationship with the three categories of reading strategies. The prediction equation is as follows:

$$Y_{\text{Predicted TOEFL Reading Score}} = 22.78 + 2.30\ (\text{GLOB}) + 3.54\ (\text{PROB}) - 3.70\ (\text{SUP})$$

All three categories of reading strategies were significant predictors of the reading proficiency at $p < .05$ level. Beta coefficients express coefficients in terms of the same standard deviation units; they are useful in comparing the relative importance of each IV to the regression model (Rovai, Baker, & Ponton, 2014). The beta weights of the problem-solving strategies (β = .276, p =.001) and support strategies (β= -.270, p = .001) were larger than that of the global strategies (β= .187, p = .024). It is important to note that the beta coefficient for support strategies was negative; thus, the higher the reading score, the lower the score for support strategy use.

Discussion

This study investigated reading strategy use and reading proficiency among 241 students of EFL at two universities in China (one Tier I university, and one Tier II university). Significant findings pertained to (a) the frequency and pattern of strategy use among this population of learners, and (b) the relationship between reading strategy use and reading proficiency among the sample population.

Frequency and pattern of strategy use

Participants in the current study reported being moderately active users of learning strategies overall, with problem-solving strategies being the most used and support strategies the least used. As noted by Oxford (1996), learning strategy use in general tends to vary by cultural group; thus, it is interesting to compare current findings with outcomes of similar studies conducted in China. The pattern of strategy use among participants in the present study was similar to that reported in two other investigations that utilized the SORS to measure reading strategy preferences among Chinese

university students (Poole, 2005; Zheng & Kang, 2014). Specifically, participants in all of these studies used problem-solving strategies the most and support strategies the least, with global strategies falling in the middle.

Interestingly, a preference for problem-solving strategies on the part of learners has been noted in several other studies conducted in EFL settings, including Thailand (Boonkongsaen, 2014), Colombia (Poole, 2009), and Turkey (Temur & Bahar, 2011); however, in some cultural contexts, markedly different patterns of strategy use have been reported. For example, Tavakoli (2014) reported that Iranian university students' *least-used* strategy category was problem-solving strategies, with support strategies being the *most-used* category. Further discussion of strategy use among current study participants is provided in the following section, in conjunction with examination of the relationships between strategy use and reading proficiency.

Reading strategy use and reading proficiency

Two significant findings were generated from the current study in regard to reading strategy use and reading proficiency. First, Pearson *r* correlations revealed significant correlations between reading proficiency score and two categories of reading strategies: problem-solving strategies and global strategies. Second, the multiple regression equation revealed that a combination of all three reading strategy variables (global strategies, problem-solving strategies, and support strategies) was predictive of reading proficiency, jointly accounting for 10% of the variation in TOEFL reading score. The beta weights for problem-solving strategies and global strategies were positive, with problem-solving strategies being the most significant predictors of TOEFL reading score. Interestingly, whereas the use of global strategies and problem-solving strategies was linked to higher reading proficiency, the regression equation showed an inverse relationship between support strategy use and reading proficiency. In other words, study participants who showed higher support strategy use scored lower in reading proficiency. Few SORS studies of reading strategy use and reading proficiency among ESL or EFL students in university settings to date have incorporated correlational or multiple regression analysis, and no such investigations have been previously conducted in China. Thus, only limited comparisons can be made between outcomes from the current investigation and previous related research. Two studies of interest in that regard, however, are Sheorey and Baboczky's (2008) study of Hungarian EFL students and Madhumathi and Gosh's (2012) study of ESL students in India. Findings from these investigations revealed a significant positive relationship between reading proficiency and use of reading strategies, with global strategies being the most strongly linked to proficiency.

In the current study, both global and problem-solving strategies were found to be significant predictors of reading proficiency score; however, problem-solving strategies (rather than global strategies) were the most strongly predictive. Interestingly, problem-solving strategies were the most frequently-used type of reading strategies among the Chinese students who participated in this study, and global strategies were the second highest category. These findings, coupled with results reported by other researchers (Poole, 2005; Xu, 2007; Zheng & Kang, 2014), point to the value of EFL teachers in China providing university students with instruction in the use of both problem-solving and global strategies. They also reveal a need for future research to examine why and how (i.e., in what specific ways) these strategies are beneficial for this population of learners. It may be that since university-level English language teaching in China is heavily test-based, with a significant focus on preparing students to successfully master

the China English Test (CET), problem-solving strategies are heavily emphasized by teachers. Indeed, problem-solving strategies such as skimming, scanning, and guessing the meanings of unfamiliar words from context are particularly useful in test taking.

Future studies might be designed to examine students' use of reading strategies in conjunction with a wide range of reading tasks in order to closely examine the interaction between reading strategy use and task type. In this type of design, participants could be asked to provide an explanation or rationale for their individual strategy choices across tasks.

Finally, the inverse relationship between support strategy use and reading proficiency evidenced among the study population, coupled with the fact that support strategies were the least-used type of reading strategy, warrants the attention of practitioners and researchers interested in English teaching and learning in Chinese university contexts. In regard to the negative correlation between support strategy use and reading proficiency, one finding from general language learning strategy research involving Rebecca Oxford's SILL may shed some light. Some previous studies which incorporated the SILL as a measure of strategy use have demonstrated a curvilinear relationship between language learning strategy use and overall English proficiency (Park, 1997). The implication is that learners at lower proficiency levels may need to rely more on support strategies, whereas those at higher proficiency levels no longer need this type of scaffolding. No previous investigations into reading strategy use utilizing the SORS have revealed this type of inverse relationship; therefore, current findings are unique, and they suggest a need for further exploration. Participants in the current study were all English majors at a relatively high proficiency level in English. It is possible that support strategies (such as looking up words in a dictionary, reading difficult segments of text aloud, or taking notes) could be more useful to lower proficiency learners. Future studies might be designed to examine the relationship between reading strategy use and reading proficiency using similar methodology among Chinese students spanning a broader range of proficiency levels and majors.

Limitations and additional recommendations

The current study, like all research endeavours, was not without limitations. First, a likert-scale, self-report instrument was utilized to measure strategy use. By their very nature, self-report instruments are limited in that they measure students' perceptions of their strategy use, as opposed to assessing actual strategy use during a given task. Second, the sample population was comprised of university students from two institutions in northwest China (one Tier I university and one Tier II university). Thus, findings are not generalizable to the broader population of Chinese students, or to all Tier I and Tier II universities in China.

Thus, in addition to the recommendations for future research previously presented in the discussion section, two additional recommendations are presented here. First, future investigations might incorporate measures of actual strategy use during a given reading task or across multiple types of reading tasks. Both quantitative and qualitative assessments could be used in order to provide triangulation of data. Second, future studies could examine the differences in performance across a greater number and variety of higher education institutions in China.

Conclusion

This quantitative investigation into the relationship between reading strategy use and reading proficiency among EFL students in China produced several interesting findings. The 241 participants this study reported being moderately active strategy users of all three types of reading strategies measured by the SORS (global, problem-solving, and support strategies), with problem-solving strategies being the most used and support strategies the least used. Pearson *r* correlations revealed that global strategy use and problem-solving strategy use were positively correlated with reading proficiency score. Results of a multiple regression analysis revealed that, for the study population, both problem-solving strategy use and global strategy use were predictive of higher reading proficiency. Also of note is the fact that the regression equation indicated an inverse relationship between support strategy use and reading proficiency, with participants who reported higher support strategy use scoring *lower* in reading proficiency. Taken together, findings from the current study add support to previous research that has demonstrated a linkage between reading strategy use and reading proficiency, while also pointing to the importance of global and problem-solving strategies for Chinese EFL learners. Lastly, these findings reveal a clear need for future research examining the complex interaction between reading strategy use and reading proficiency among university students of EFL in China.

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