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Effects of explicit training in (meta-)cognitive strategy use in English (L3) on high school students' reading outcomes in Arabic (L1)

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Abstract: Metacognition refers to the ability to regulate and monitor one's own cognitive processes; it entails awareness and control of planning, monitoring, and evaluating. Despite the importance of metacognition, very few studies have been conducted to determine whether metacognitive reading strategies are transferrable across languages and their role in reading comprehension. The present study examined the extent to which explicit training in metacognitive reading strategies (MCRS) in English could result in improved reading comprehension outcomes in English (L3) and Standard Arabic (L1) among Moroccan trilingual learners of English as an L3. Using the purposive sampling technique, 60 struggling K12 students were randomly assigned to an experimental group (n=30) and a control group (n=30). All participants were administered a reading comprehension pre-test and post-test in English and Standard Arabic (L1). Only the experimental group received training in the application of MCRS during the reading process in English. The one-way-MANOVA test was used to examine the difference in both groups' reading comprehension scores before and after the intervention. The result of our study showed that the experimental group's reading comprehension scores in both English (L3) and Standard Arabic (L1) improved significantly. Based on these findings, we recommend that learners of English as a foreign language, mainly the struggling ones, should be explicitly taught how to use MCRS and that a link be established between the various languages taught in school to facilitate the transfer of strategies across target languages.

Keywords: Trilingual learners; explicit strategy instruction; Cognitive Retroactive Transfer; reading comprehension



1.1 Introduction

Due to emigration, colonization and globalization, most educational systems worldwide adopt a bi/multilingual approach in which international languages are taught along with national languages. Functioning as a global language of science, business, technology, and communication, English has become a lingua franca essential for successful academic and professional careers. In fact, “the knowledge of English, in particular, has been truly considered as a tool for future career and life opportunities (Abu-Rabia, 2018, p. 2)”. Its high status has triggered a growing demand for its learning all over the world, where the majority of countries have perceived it as a foreign language to be taught besides other languages, resulting in *bi/multilingual educational systems* (Cenoz & Gorter, 2013; Cummins, 2007).

In Morocco, English is considered a foreign language (L3) and is taught in both public and private institutions (Buckner, 2011; Sadiqi, 1991). Due to the social and economic globalization driven by the rapid spread of the Internet, there has been a strong demand for English, which has increased its role and presence in Morocco. Today, Moroccan students learn Standard Arabic as their L1 in the first grade and English as L3 starting from the ninth grade in public school and the first grade in private schools and are tested in these languages along with other languages throughout their academic careers. Moroccan students have to learn to read, write and speak these languages along with other ones. Learning to read and deal with reading comprehension tasks in national languages such as Standard Arabic and foreign languages like English is an essential skill prerequisite to a successful academic career.

Reading is defined as a process in which readers decode and comprehend written texts by converting the symbols of the writing system into the spoken words that they represent (Cline et al., 2006). It is a multi-faceted process that entails the application of a number of (meta-)linguistic and (meta-)cognitive strategies (Perfetti et al., 2005). Reading comprehension is an important language skill that is assessed by institutions around the world to determine students' linguistic proficiency in the target language. Following the rest of the world, Moroccan students have to take many reading comprehension exams throughout their academic and professional careers. In high school, for instance, Moroccan students study Standard Arabic as L1 and English as L3 and have to take reading comprehension exams in these languages to obtain their Baccalaureate.

Given the complexity and multidimensionality of reading comprehension, most language learners struggle to decode the meaning of the target text (Ahmadi et al., 2013). According to research, metacognitive reading strategy instruction can help struggling readers improve their reading comprehension performance (Wolf & Gottwald, 2016). (Meta)cognitive reading strategies (MCRS) are found to reduce difficulties faced during the reading process (Samad et al., 2017) and improve students' reading comprehension achievements (Muhid et al., 2020).

Research on cross-language transfer reported an interconnectedness between languages. The *Linguistic Interdependence Hypothesis* (LIH) (Cummins, 1979, 2007) asserts that there is a strong link between L1 and L2, to the extent that a deficiency in one language can be found in the other. It assumes that literacy-related skills that are fully developed in an L1 can positively transfer to an L2 when learners are sufficiently exposed to L2. The main assumption of LIH is that learning two languages, regardless of orthography type, will improve the learning process of both through the *Common Underlying Proficiency* (CUP) (Cummins, 1979). This CUP, which is shared by all languages, enables the transfer of (meta)linguistic skills from one language to another. The *Threshold Hypothesis*, on the other hand, suggests that a minimum level of language proficiency in L1 is required to facilitate skill transfer to an additional language (Cummins, 1979). That is, once learners acquire literacy-related skills in their L1, they become ready to transfer them to L2 when they learning an additional language (Abu-Rabia, 2001).



It should be pointed out that Cummin's LIH was extended by other researchers into the *Cognitive Retroactive Transfer* (CRT) hypothesis. This suggests a reverse transfer of (meta-)language skills from L2 back to L1 among bilingual learners of English as a foreign language (Abu-Rabia & Bluestein-Danon, 2012; Abu-Rabia et al., 2013). The main claim of this hypothesis is that a backward transfer of linguistic knowledge and skills from L2 to L1 can take place after intervention in (meta-)linguistic skills in L2.

While reviewing the relevant literature across international contexts, it was found that a few studies considered the effects of MCRS on both L1 and L2 among bilingual learners. For example, Salataci and Akye (2002) investigated Turkish students' reading strategies in Turkish (L1) and English (L2) and discovered that strategy instruction in Turkish had a positive effect on both Turkish and English reading strategies as well as reading comprehension in English. In a similar study, Rabadi et al. (2020) examined the use of MCRS among Jordanian university students and found that both English and French learners used MCRS moderately. Talebi (2012) investigated the effects of reading strategy training in English (L2) on improving reading strategy awareness in Persian (L1) among Iranian learners of English (L2) and indicated that the experimental group outperformed the control group on both the English and Persian reading comprehension tasks.

Evidence from the aforementioned findings suggests that explicitly teaching reading strategies in L2 can improve students' reading comprehension scores in their L2 and L1. This research also suggests that reading strategies can be transferred from one language to another and that an explicit strategy instruction in MCRS can lead to an improvement in reading comprehension outcomes in L1 and L2. While reviewing the literature, it was noticed that most of the research studies investigating the association of reading strategy awareness across languages have documented only the use of reading strategies in L1 and L2. The innovation of the current study was to examine the extent to which explicit reading strategy instruction in English as L3 could lead to an improvement in reading comprehension scores in Standard Arabic (L1) among the experimental group. Hence, the following research question guides the study:

To what extent does explicit reading strategy instruction in English improve reading comprehension achievements in English and Standard Arabic?

2.1 Methods

Participants

The participants were K11 students studying in a state high school in El Jadida, Morocco. Based on their scores in English and Standard Arabic, 60 struggling learners including 23 males and 37 females were selected through the purposive sampling technique and randomly assigned to an experimental group (n=30, mean age=17.13, SD 1.00) and a control group (n=30, mean age=17.03, SD =.96). The participants started learning Arabic as their L1 from the first grade and English as L3 from the ninth grade. The experimental group benefitted from explicit training in MCRS while the control group did not.

Data collection tools

Both groups were administered a reading comprehension task, one in English and one in Standard Arabic. The texts were designed by the researchers in collaboration with highly experienced language teachers. Each reading task was



an academic text that matched the Standard Arabic and English language curricula for first-year (K11) Baccalaureate students.

Procedure

A reading comprehension pretest, one in English and one in French was administered to the participants in both the control group and experimental group to test their reading comprehension skills before the intervention. Each text contained 10 multiple-choice questions (Abu-Rabia & Sanitsky, 2010). The participants were asked to read the text silently before answering questions based on the target text. After one week, the same procedure was used in the Standard Arabic reading task.

Following the administration of the pre-tests, the cohorts in the experimental group received explicit training in the use of MCRS twice a week for four months (45 minutes in each training session). The participants were trained to use the MCRS in three stages, starting with the application of the MCRS in the planning, then the monitoring, and finally the evaluating stage. The teacher showed how to use each strategy using Think-aloud Protocol. After the reading strategy-based instruction in English,

Design and data analysis

The current study used a quasi-experimental design that included a pretest, a posttest, and a control group. The independent variable was the reading strategy training in English and the dependent variables were the reading comprehension outcome in English and Standard Arabic.

Reading comprehension scores were calculated by subtracting the total number of correct answers from all ten (10) items. The mean values and standard deviations of the variables were calculated using descriptive statistics. The Multivariate Analysis of Variance (one-way MANOVA) test was also used to see if there was a significant difference in the reading comprehension scores of both groups in English and Standard Arabic before and after the intervention.

3.1 Results

The current study compared the experimental group and control group's reading comprehension scores in English (L3) and Standard Arabic (L1) before and after the intervention. The data was collected from the reading comprehension scores the participants obtained in the reading comprehension task in English and Standard Arabic.

Our results revealed that the treatment group significantly scored higher in the reading comprehension post-tests in English ($M=7.30$, $SD: 1.48$) and Arabic ($M=6.10$, $SD: 1.60$) than the control group (English: $M=2.77$, $SD: 1.45$; Arabic: $M=4.80$, $SD: 1.66$). Tables 1 and 2 summarize both group's scores in the pre-tests and post-tests in English and Standard Arabic:

Table 1. Means of the experimental group' reading comprehension scores

	English		Arabic	
	Means	S. D.	Means	S. D.
Pre-test	2.43	1.25	4.17	1.28
Post-test	7.30	1.48	6.10	1.60

Table 2. Means of the control group' reading comprehension scores

	English		Arabic	
	Means	S. D.	Means	S. D.
Pre-test	2.63	1.86	4.27	1.91
Post-test	2.77	1.45	4.80	1.66

The MANOVA test results indicated that there was no significant disparity between the treatment group and the comparison group at the level of the reading comprehension scores in English and Arabic before the training in MCRS: Wilks' $\Lambda = .99$, $F(2, 57) = .15$, $p = .85$. However, the MANOVA tests showed a statistically significant difference between both groups in the post-tests: Pillai's Trace = $.72$, $F(2, 57) = 76.03$, $p < .001$. Additionally, the tests of between-subjects effects disclosed that the explicit strategy instruction in metacognitive reading strategies significantly affected reading comprehension scores of the cohorts in the experimental group in both English ($F(1, 58) = 142.27$; $p < .001$) and Arabic ($F(1, 58) = 9.45$; $p < .001$).

4.1 Discussion and Conclusions

The MRSQ results showed the experimental group's reading comprehension scores significantly improved when reading academic texts in English and Arabic after four months of training in the use of MCRS in English. This finding indicates that the participants reversely transferred MCRS from English (L3) to French (L2), and therefore validates the CRT hypothesis, which assumes the possibility of a reverse transfer of language skills after the intervention. Our results also revealed a significant improvement in the experimental group's reading comprehension scores on post-tests in English and French. Our findings are also compatible with other results which showed that the cohorts in the experimental group scored higher than the participants in the control after intervention in reading strategy awareness (Muhid et al., 2020).

Our findings along with the aforementioned studies corroborate the efficiency of the use of metacognitive strategies during the reading process. This implies that the participants in the experimental group not only benefited from the training in the use of MCRS in English but also managed to transfer these strategies from English to French



when doing the reading comprehension task in French. This finding supports the Cognitive Retroactive Transfer Hypothesis (Abu-Rabia & Bluestein-Danon, 2012; Abu-Rabia et al., 2013), which proposes a reverse transfer of (meta-)linguistic skills from an L3/L2 to an L1 among tri/bilingual learners of English a foreign language. Our result also provides evidence of cross-language transfer of (meta-)cognitive reading strategies between languages as reported by other researchers (Rabadi et al., 2020; Salataci & Akyel, 2002). Our finding along with other results lend additional support to the claim that tri/bilingualism enables a positive transferability of (meta-)cognitive linguistic skills and strategies across languages (Abu-Rabia, 2018). The results of the current study validate Cummins' *Common Underlying Proficiency* (CUP) hypothesis (1979, 2007), which assumes the existence of one common language proficiency that enables learners, be them bilingual or trilingual, to transfer acquired (meta-)language skills from one language to another

The results also have several pedagogical implications for language teaching/learning theory and further research on MCRS. Teachers are called upon to improve Moroccan students' reading strategy awareness by training them to apply MCRS when reading academic texts. This way, Moroccan language learners can become skilled at reading comprehension, which is highly crucial to language acquisition. This can be done by offering learners, mainly the poor, regular explicit reading strategy instruction in all the languages they study to increase their reading strategy awareness. This can enhance their meta-cognitive and transfer strategy awareness among language learners, which can help ameliorate their reading comprehension outcome in particular and language learning at large.

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