# The Intensity and Direction of CET Washback on Chinese College Students' Test-taking Strategy Use

Wei Xiao

School of Foreign Languages and Cultures, Nanjing Normal University, Nanjing, China

*Abstract*—Test-taking strategies are the test-taking processes which the students have consciously selected, and can be regarded as the strategies used in test context. The College English Test (CET) is a large-scale high-stakes education test for college non-English majors in China, which conducts impact on College English teaching and learning, namely "washback". Although researches concerning the washback on test-taking strategy use has been conducted in different cultural backgrounds, few studies are focused on Chinese college students. This paper analyzes questionnaire data from 284 Chinese non-English majors, in order to explore the characteristics of their test-taking strategy use, as well as the intensity and direction of CET washback on it. The findings show that the students' test-taking strategy use is test-oriented rather than focusing on language learning and use. CET washback on test-taking strategy use is not intense, moderately promoting cognitive strategy use and weakly promoting test management and test-wiseness strategy use, and the direction CET washback on test-taking strategy use tends to be positive.

Index Terms-test-taking strategies, CET, washback, intensity, direction

### I. INTRODUCTION

Test-taking strategies are the test-taking processes which the students have consciously selected (Cohen, 2006), and can be regarded as the strategies used in a test context. According to Cohen (2006), test-taking strategies can be classified into three largely distinct sets: language learner strategies, which are the abilities to use one's language knowledge and competence test, mainly comprised of cognitive and metacognitive strategies; management strategies, which are the abilities to benefit from the characteristics of the test to perform better; and test-wiseness strategies, which are the abilities to exclusively rely on test facets or the environment to answer test items, having scarcely anything to do with language competence (Millman et al., 1965; Xu & Wu, 2011).

The College English Test (CET) is a large-scale high-stakes education test for college non-English majors in China. It conducts impact on College English teaching and learning, namely "washback". Faced with such a high-stakes test, it is of necessity to investigate its washback on every aspect and every procedure in both of teaching and learning. In China, a line of studies have been carried out on CET washback (e.g. Gu, 2007; Wang, 2010; Xie & Andrews, 2013), which have covered several main aspects of washback on learning and teaching, but failed to involve CET washback on test-taking strategy use. In the language testing field worldwide, although there are several studies on washback concerning test-taking strategy use (e.g. Watanabe, 1992; Andrews, Fullilove & Wong, 2002; Qi, 2005, 2007; Lewkowicz & Zawadowska-Kittel, 2008), those focusing particularly on students' test-taking strategy use have not yet aroused much attention. An investigation into CET washback on test-taking strategy use not only can enrich the theories of test-taking strategies and washback but also provide feedback for CET test reform and College English teaching and learning, and therefore necessitates immediate research.

The present study investigated CET washback on students' test-taking strategy use, and the following three research questions were explored:

Research Question 1: What are the characteristics of students' test-taking strategy use?

Research Question 2: How intense is CET washback on students' test-taking strategy use?

Research Question 3: What is the direction of CET washback on students' test-taking strategy use?

# II. LITERATURE REVIEW

# A. Washback Models

Since Alderson and Wall posed the question "whether washback exists" in 1993, researchers have long attempted to develop models for washback study. According to their relevance to the present study, the following five models will be briefly discussed in this section.

Alderson and Wall's (1993) "Washback Hypotheses". These hypotheses lay out the main aspects of teaching and learning that may be affected by a test, including learning content, learning strategies, learning rate and sequence,

attitudes toward learning and so on, and provide a crucial guidance for empirical washback studies, following which the present study attempts to shed some light on these learner-related aspects by means of an empirical investigation into students' English test-taking strategy use. These hypotheses also serve as a blueprint for later washback models. However, what these hypotheses present fails to provide us with a systematic model which expresses the potential interactions among the various factors involved in the complex contexts of school teaching and learning.

Hughes' (1993, cited in Bailey, 1996, p. 257-279) Trichotomous Model. In this model, the participants, processes and products of teaching and learning are distinguished, recognizing that all the three elements may be affected by the nature of a test. Here Hughes emphasizes the participants' perceptions and attitudes and how these factors affect what they do. According to the model, tests will affect students' perceptions and attitudes towards their study, which in turn affects the processes and products of learning.

Bailey's (1996) model. This model emphasizes the significance of students as a group of stakeholders, whose learning may be influenced by the other participants' processes indirectly. It is also suggested that using a series of behaviors would bring about either positive or negative washback, depending on whether the actual language proficiency of test takers has developed as a result of these processes. Bailey's claim is very essential to the present study. No matter what kinds of strategies the students use or how frequently the students use a strategy due to the influence of washback, it is whether strategy use can improve the language proficiency or not that is the criterion to determine whether or not it is a positive washback to use such test-taking strategies. Therefore, it is necessary to investigate the relationship between test-taking strategy use and the students' English proficiency, in order to examine the direction of washback.

Shih's (2007) model of students' learning. In this model, students' learning and their psychology may be affected by three sets of factors, i.e. extrinsic factors, intrinsic factors and test factors. The extrinsic factors contain the socioeconomic factors, school and educational factors, family, friends and college factors and personal factors. The intrinsic factors contain individual differences, personal characteristics and personal perceptions of the test. The test factors concern the properties of the test itself, such as its stakes, content, structure and purpose. The three sets of factors exert mutual influences on each other and they all pose influences on students' learning and their psychology, such as learning content and time, strategy, motivation and test anxiety. Besides, the model indicates that washback may change as time goes on. In other words, there may be some differences between washback on students who have sat a test and those who have not.

Green's (2007) three models on washback direction, intensity, variability and test stakes. According to these models, an overlap between test characteristics and the focal construct can yield positive washback; students' value of success on the test above developing skills for the target language use domain will exert more intense washback; individual differences will result in variability in washback; and test stakes influence both test characteristics and test takers' characteristics and views of value.

These models reveal that washback is far more complicated than was supposed to be. It can vary at several dimensions, of which intensity and direction are two important ones. Intensity means how strong the washback effect is while direction means whether this effect is positive or negative. The present study is then devoted into studying the intensity and direction of CET washback on students' test-taking strategy use. It is hypothesized that CET (the test) exerts influences on students (participants), affecting their perceptions and attitudes towards CET, which in turn influence students' test-taking strategy use (processes). This phase determines the intensity of CET washback. Test-taking strategy use may be beneficial or detrimental to CET score (products), which provides evidence to the direction of CET washback. If CET exerts a more frequent use of test-taking strategies, whose frequent use in turn increases CET score, it can be determine that CET washback on test-taking strategy use is positive, and vice versa.

#### B. Empirical Studies

A line of studies have concerned the washback on test-taking strategy use. In Japan, Watanabe (1992) investigated the washback effects of the Japanese university entrance exams on students' language learning strategies, finding that those students who entered the college through the exam reported to have used a much wider range of learning strategies than the recommended students, who were supposedly free from the effects of the exam and thereby used more strategies. Thus, the results led to the plausible conclusion that the entrance exams have induced a positive washback on students' learning strategies, which was contrary to many negative judgments that the entrance exams prevented students from using learning strategies. However, this study did not consider test-wiseness strategies. If test-wiseness strategies had been involved, more results should have been found out in addition to the results of learning strategies used in general.

In Poland, Lewkowicz and Zawadowska-Kittel (2008) investigated the washback effects of a newly introduced English test "Nowa Matura", on teachers' attitudes, teaching content and methods. The results showed that this test exerted very intensive washback on English teaching and learning, which was focused on test format, test-taking strategies and test preparation practices.

In China, Andrews, Fullilove and Wong (2002) conducted a study on the washback of the "Use of English" oral examination on students' spoken English performance. The results show that the oral examination may cause may lure the students to use test-taking strategies, which may be very superficial and exam-specific. Qi (2004, 2007) conducted a series of washback studies on the National Matriculation of English Test (NMET), and found that although the

intentions of test constructors were to deemphasize linguistic knowledge and to emphasize communicative language use, the actual teaching and learning still focused on linguistic knowledge and test-oriented skills and content, due to the high stakes of the test. Wang (2010) investigated the washback effects of a new CET listening module on students' learning, through a questionnaire survey to 293 second and third year non-English majors. The results found that although students reported to have used the learning methods suggested by the *Teaching Syllabus* and the *Test Syllabus*, most of them also reported to have used test-wiseness strategies, attended test preparation class and practiced model tests.

These studies covered a widespread of tests, showing that a test may cause students' more frequent use of test-taking strategies. However, few aim at studying CET washback on students' test-taking strategy use in particular. In order to provide enriched evidence to test validity and shed light on College English teaching and learning, it is necessary to probe into CET washback on test-taking strategy use.

#### III. METHODOLOGY

#### A. Instrument

This study used a questionnaire scale to collect data. The scale was designed according to the cognitive and metacognitive strategy scale of Purpura (1999), the test management strategy framework of Cohen & Upton (2007) and the test-wiseness strategy theory of Millman et al. (1965), including 51 items. The scale mainly followed Cohen's(2006) classification, but language learner strategies were divided into cognitive strategies and metacognitive strategies, in that the former is under the monitor and management of the latter, thus distinctive from each other (Kong & Li, 2008). Therefore, the 51 items of the scale were grouped into four sub-scales, i.e. cognitive strategy (Q1-Q18), metacognitive strategy (Q19-Q27), test management strategy (Q28-Q35) and test-wiseness strategy (Q36-Q51). The items measured on a 5-point Likert scale, where 1="never", 2="rarely", 3="sometimes", 4="often" and 5="always". Before the formal investigation, 35 students participated the pilot study, and some details in wording were revised according to their feedback.

## B. Data Collection and Analysis

350 students from two universities in Southeast China participated the formal investigation. In order to guarantee the validity of the data, the researchers explicitly demonstrated the goal of the study before the investigation. The researchers were also ready to answer any questions during the investigation. After the investigation, the researchers invited the students to leave their e-mail addresses, and later asked for their CET4 total score and sub-scores via e-mail. Excluding the invalid questionnaires, 284 valid ones were left. They included 159 students from a key university and 125 from an ordinary university. 173 of them were male (39.1%) and 111 female (60.9%). Their ages ranged from 18 to 25 years (mean age=20.4 years). 69 students (24.3%) were in the first grade and 215 (75.7%) in the second grade. 53 of them (18.7%) studied liberal arts and 230 (81.3%) studied science and engineering.

SPSS 18.0 was used to analyze the data. First, the exploratory factor analysis (EFA) was conducted to determine the construct of the four sub-scales respectively, and 5 unqualified items were dropped, thus 46 were retained. Reliability analysis showed that the reliability coefficient of cognitive sub-scale was 0.823, metacognitive 0.758, test management 0.763, test-wiseness 0.788, and 0.921 for the total scale, indicating a high reliability. The mean scores of items under the same sub-scale were computed as frequencies of use of the four types of test-taking strategies. Second, an independent-samples t-test was used to make a comparison of the frequencies of strategy use between the students who had sat the CET and those who had not, and Cohen's *d* was employed to indicate the effect size of strategy use between groups. In considering how "large" an effect size is, Cohen (1992) came up with some effect size conventions based on the effects found in psychology research in general: an effect size about 0.20 should be considered small, 0.50 medium, and 0.80 large. Third, a decision tree model (DTM) was used to explore which strategy lead to a high test score. DTM is able to deal with complicated data by extracting obvious characteristics of the data and the critical value of characteristics which have significant effects (Ni, 2010). In other words, DTM is able to make classification of the individuals in a group according to one or several variables, and examine the differences between different groups. In the present study, the classification indicates which strategy use tends to win more points in CET4, i.e. the prediction of strategy use to test score.

#### IV. FINDINGS AND DISCUSSIONS

#### A. Characteristics of Test-taking Strategy Use

The descriptive statistics show that cognitive and metacognitive strategies are least frequently used, with the means respectively 2.96 and 3.10. Test management and test-wiseness strategies are more frequently used, with means respectively 3.77 and 3.38 (see Table 1). It indicates that during sitting CET4, although there are activities of learning and comprehension of language materials, comprehending language materials, during which language competence is used, the test management strategies and test-wiseness strategies -- related to the test method characteristics -- are obviously used more frequently than cognitive strategies and metacognitive strategies.

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TEST-TAKING STRATEGY USE AT THE STRATEGY-SET LEVEL(N=284)									
	Min	Max	М	SD	Skewness	Kurtosis			
Cognitive strategies	1.29	4.87	2.96	.548	.124	.551			
Metacognitive strategies	1.00	4.67	3.10	.638	210	046			
Test management strategies	1.58	5.00	3.77	.617	340	.054			
Test-wiseness strategies	1.66	4.88	3.38	.568	043	.288			

TABLE I.

Cognitive and metacognitive strategies can activate the language knowledge and skills of listening, speaking, reading, writing, vocabulary and grammar. If a test could guide the students to use more such strategies, it would help with the development of the students' strategy competence and language ability. The use of such strategies should be encouraged, and a test should be designed to guide the students to use such strategies, just as they do in an authentic context. Even if the students made preparations for such a test, they would be guided to use these strategies during test preparation or test taking, thus developing their strategy competence and language ability. That is what a test should be like and what a test is for. However, it is found that the students use more test management strategies and test-wiseness strategies, which are more or less useless in with language development. The students may not care whether their language abilities are reflected in the test. To the contrary, they care about whether they can achieve high scores.

# B. Intensity of CET Washback on Test-taking Strategy Use

The intensity of washback varies from person to person. The students who have sat the CET may suffer more intensive washback effect than those who have not. To verify this, the samples from the key university were used, and were divided into two groups, the "sat" group (n=90) and the "not sat" group (n=69). The differences of test-taking strategy use were compared in order to explore the intensity of CET washback (see Table 2).

COMPARISONS AT STRATEGY-SET LEVEL BETWEEN "SAT" GROUP AND "NOT SAT" GROUP										
Test-taking strategy	Sat (n	=90)	Not sat (n=69)		t-value	<i>p</i> -value	Effect size			
	Μ	SD	М	SD						
Cognitive	3.16	.551	2.93	.532	2.723**	.007	.424			
Metacognitive	3.24	.612	3.21	.666	.341	.734	.047			
Test management	3.90	.636	3.72	.620	1.804	.073	.286			
Test-wiseness	3.58	.586	3.41	.517	1.836	.068	.287			
** p<.01										

TABLE II. Idadisons at std ategy-set i evel detween "sat" gdolid and "not sat"

As is shown in Table 4.2, students of both groups use test management and test-wiseness strategies more frequently, and metacognitive and cognitive strategies less frequently. The means of metacognitive, test management and test-wiseness strategies of students who have not sat the CET are above 3, but that of cognitive strategies is less than 3. The means of all four sets of strategies of students who have sat the CET are all above 3, and higher than those of students who have not sat the CET. The difference in cognitive strategy use reaches the 0.05 level of significance, and the differences in test management and test-wiseness strategies are near this level of significance. The effect sizes show that the difference in metacognitive strategy use of the two groups approaches zero, those of test management and test-wiseness strategy use approach a weak 0.2, and that of cognitive strategy use approach a medium 0.5. Therefore, it can be seen that the CET moderately promotes cognitive strategy use while weakly promoting test management and test-wiseness strategy use, echoing the findings of Watanabe (1992) that an exam may promote strategy use.

Since students who have sat the CET are all in their second year and have studied College English one year longer than students who have not sat the CET and in their first year, it is possible that they are already at a higher level in English proficiency. Considering that language proficiency exerts influence on strategy use (Oxford, 1990), it is possible that cognitive strategy use is related with English proficiency. A further exploration of the interactional effect between English proficiency and whether or not sat the CET is therefore needed.

Metacognitive strategies concern with the management of language learning processes, and tend to be mature after high school graduation (Wen, 2001). Therefore, The CET may have little influence on metacognitive strategy use. However, further longitudinal research would be needed to confirm this conclusion.

As to test management and test-wiseness strategies, students have been trained in these strategies often in high school, during which time there is an obvious test-oriented tendency (Gu & Xiao, 2012). In the long processes of training and test preparation, students have gradually developed their test management and test-wiseness strategies to a relatively high level, which tends to be stabilized from then on. The CET may only be a trigger but not a decisive factor in attracting the students to use these strategies, which explains the findings that the effect sizes on test management and test-wiseness strategy use is rather weak and fail to reach the 0.05 level of significance.

All in all, The CET does affect test-taking strategy use, but not that intensively. It only moderately promotes cognitive strategy use and weakly promotes test management and test-wiseness strategy use.

# C. Direction of CET Washback on Test-taking Strategy Use

The judgment of washback direction is rather a judgment of value (Qi, 2011), for people with different standpoints, benefits, interests and value beliefs may come to various conclusions on the same phenomenon. In the present study, it

is presumed that positive washback is beneficial to teaching and learning, while negative washback is detrimental. It is also believed that test performance is a reflection of language ability. Since the previous section has found that CET promotes the use of cognitive, test management and test-wiseness strategies, it can be inferred that if cognitive strategy use, which involves the use of language ability, win more points in the CET, the washback of CET on test-taking strategy use is positive. If test-wiseness strategy use, which involves using abilities to exclusively rely on test facets or the environment to answer test items, the washback is negative. If test management strategy use, which involves both the language ability and the exploitation of test characteristics, the washback may be both positive and negative.

To test the hypothesis, the Decision Tree Model was used to explore the prediction of test-taking strategy use to The CET4 score. The modular "Tree" in SPSS 18.0 was employed and the default "CHAID" method was adopted. The CET4 score was treated as the dependent variable, and the means of cognitive, metacognitive, test management and test-wiseness strategies were treated as independent variables. The samples used were the 215 students from both sampled universities who have reported their CET4 scores (the model is shown in Fig. 1).



Figure 1. The Decision Tree of CET4 Score

The model shows that, although initially four sets of strategies were entered into the model, only two of them, i.e. cognitive strategies and test-wiseness strategies, were retained after running the model, and the model has two layers in the end. CET4 score, the dependent variable, is affected in sequence by two decisive variables, cognitive strategy use and test-wiseness strategy use. The other two independent variables, metacognitive strategy use and test management strategy use, are eliminated. The F values of the two layers by the two decisive variables are respectively 39.523 and 9.116, with p-values both below 0.05, indicating a significant difference between the two layers and that this classification is valid.

It can be seen from the model tree that the first significant difference lies in cognitive strategy use, with the critical value of 3.238, more or less in the middle of a 5-point Likert scale. Students whose means of cognitive strategy use are above 3.238 (29.8% of all students) have an average CET4 total score of 504.633, significantly higher than that of the students whose cognitive strategy use are below 3.238 (70.2%), which is 436.171 on average. It indicates that cognitive strategy use has a significant effect on CET4 score.

Within the students whose cognitive strategy use are below 3.238, test-wiseness strategy serves as the second significant difference, where the critical value is 3.180, again in the middle of a 5-point Likert scale. Students with a mean of test-wiseness strategy use above 3.180 (33.5% of all students) have an average CET4 total score of 455.039, significantly higher than that of the students whose cognitive strategy use are below 3.180 (36.7%), which is 418.975 on average. It shows that test-wiseness strategy use may have an effect on test performance but only in the condition where students' cognitive strategy use is infrequent (Mean <= 3.238) and with low English proficiency (CET4 mean score = 436.171).

Therefore, it can be concluded that the characteristics of strategy use leading to the worst CET4 total score are low frequent use of cognitive strategies (Mean  $\leq 3.238$ ) and low frequent use of test-wiseness strategies (Mean  $\leq 3.180$ ), where cognitive strategy use has a stronger effect than test-wiseness strategy use.

These models indicate that cognitive strategy use plays an important role. High frequent use of cognitive strategies tends to win more points, which has been found out in line of studies across different tests in different regions (Purpura, 1999; Song & Cheng, 2006). High frequent test-wiseness strategy use also helps, but only in condition of a low frequent use of cognitive strategies and low English proficiency. Several studies have proved the limit of test-wiseness strategy use (Green, 2007; Xie & Andrews, 2013). As to metacognitive and test management strategy use, no significant effects have been found. Previous research also has found out the unrelatedness of metacognitive strategy use to test performance (Kong & Li, 2008), but has not found out the effects of test management strategy use empirically.

Since previous findings have shown that the CET can promote cognitive strategy use moderately and DTM shows that cognitive strategy use helps in improving test performance, it can be inferred that the CET yields moderate yet

positive washback on students' test taking strategy use. However, since the CET can promote weak test-wiseness strategy use and the latter has a certain effect on the improvement of the CET4 score, it can also be inferred that the CET has a weak negative washback. Due to the fact that the CET has a stronger effect (see the effect sizes) on cognitive strategy use than test-wiseness strategy use, and that cognitive strategy use has a stronger prediction (see the Decision Tree Model) than test-wiseness strategy use, it can be concluded in the end that the direction of the CET washback on test-taking strategy use on the whole tends to be positive.

## V. CONCLUSIONS

The present study explored the characteristics of Chinese college students' test-taking strategy use, the intensity and direction of CET washback on test-taking strategy use, and find out that students' test-taking strategy use is more test-oriented rather than focused on language learning and use. Test management strategies and test-wiseness strategies are used more frequently while cognitive strategies and metacognitive strategies are used less frequently. CET washback on test-taking strategy use is not intense, moderately promoting cognitive strategy use and weakly promoting test management and test-wiseness strategy use, and the direction of CET washback on test-taking strategy use tends to be positive.

Despite this, it should be noted that the washback effect is rather complicated. A series of factors, such as society, school education, individual differences and the test itself, may exert an influence on students' learning. Interactional effects may also exist. Therefore, the findings here still need to be further explored and re-examined, which shows the direction for future studies.

#### ACKNOWLEDGMENT

The author wish to thank Professor Xiangdong Gu and Professor Chuanbin Ni for their advice on this article. This work was supported by a project of the National Social Science Foundation (10BYY027), China, and by Research Center of Language, Cognition and Language Application, Chongqing University, China.

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Wei Xiao was born in Hubei, China in 1988. He received both his B.Sc. degree in electronic and information engineering and B.A. degree in English language and literature from Chongqing University, China in 2009, and his M.A. degree in linguistics and applied linguistics of foreign languages from Chongqing University, China in 2012. He is currently a Ph.D candidate in English language and literature in Nanjing Normal University, China. His research interests include language testing and neurolinguistics. He is also interested in structural equation modeling, event-related brain potentials and eye-tracking techniques.