A Study of the C-Test and the X-Test Performed by First-Year Science-Oriented University Students

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Abstract

This study examines the reliability and validity of the C-Test and the X-Test as well as the order of presenting the two tests. Fifty-six Thai science-oriented university students enrolled in the Foundation Course at Chulalongkorn University Language Institute participated in this study. It was found that both tests were reliable and had concurrent validity with the achievement test, the proficiency test and GPA. The students could score better when the C-Test was presented before the X-Test. This may be caused by differences in students' motivation and individual difference in retention and reading processing skills.

Introduction

The Systematic Cloze Test has been cited as a means of assessing language proficiency of non-native speakers. It has been posited to be a language test which measures the interrelationships among syntax, semantics and pragmatics. This is based on the belief that linguistic elements cannot be interpreted apart from meaning and meaning cannot be separated from the learner's knowledge of the world.

Although the advantages of the Cloze Test have been mentioned by many language testers (Oller & Perkins, 1980), the Systematic Cloze Test has been criticized due to its systematic nth word deletion, its inability to assess higher-order language skills, and other technical problems (Alderson, 1979). Consequently, many formats related to the Systematic Cloze Test have been proposed. Bachman (1985) used the Rational Cloze Test to measure higher-order

skills (the skills of processing information at the discourse level) which differ from lower-order skills at the sentence and clause-bound level. Klein-Braley and Raatz (1984) introduced the C-Test in language testing. The main difference between the Systematic Cloze Test and the C-Test lies in the way the words are deleted. While the former deletes every nth word, the latter deletes the second half of every second word.

Nevertheless, Sigott and Köberl (1993) pointed out that the C-Test cannot be satisfactorily used with advanced learners because it lacks the power to provide sufficient discrimination among subjects or tests. Therefore, they proposed the X-Test which deletes the first rather than the second half of every second word. They reported that the X-Test is more appropriate than the C-Test to test German learners of English at a higher level of competence although it could not test language competence beyond the sentence level. Boonsathorn (1990) used the C-Test and the X-Test (which he called

the MC-Test) with high school students (L1) and adult students (L2) in Alberta, Canada and found that the C-Test appeared to predict performance on the Michigan Test better than the X-Test and that both were highly reliable and valid for both L1 and L2 samples. However, the two tests had different factor structures.

Several formats of the Cloze Test have been tested out with Thai university students. Prapphal (1981) used two Systematic Cloze Tests, one text related to science and the other related to social science. The tests appeared to measure linguistic elements as well as pragmatic aspects of the language. Prapphal, Pas, and Tanapongpipat (1984) used the Rational Cloze Test to differentiate language achievers from non-achievers and found that this format of the Cloze Test could predict future academic success better than the MC (multiple choice) format.

Even though various formats of the Cloze Test have been tried out with Thai university students, there is no study which compares the C-Test and the X-Test performed by Thai science-oriented university students. Neither has the order of giving the two tests been studied. This study, therefore, aims to answer the following research questions:

1. Are the C-Test and the X-Test reliable and valid enough to be used with Thai science-oriented university students?

2. Are there any significant differences in the gain scores when the C-Test and the X-Test are presented in different orders?

Method

Fifty-six Thai science-oriented first-year students enrolled in the Faculty of Engineering and the Faculty of Science, Chulalongkorn University, in 1993 participated in this study. There were thirty-eight engineering students and eighteen science students. The C-Test was adapted from **The Bangkok Post.** The text consisted of 144 words. There were 27 deleted function words and 33 deleted content words (See Appendix A). The same text was used as the X-Test. Instead of deleting the second half of every second word, the first half of every second word was omitted (See Appendix B). Since the Cloze Test was found to be rather difficult for Thai students (Prapphal, 1981), the C-Test and the X-Test were modified in this study. In each deleted word, blanks corresponding with the number of missing letters were provided. Scoring was carried out according to the "exact word" method.

The subjects were randomly divided into two groups, each group consisting of twenty-eight students. The first group took the C-Test first and one week later they took the X-Test. The reverse order was employed with the other group. The tests were administered in December 1993. Each test lasted thirty minutes.

Table 1

The Reliability of the C-Test and the X-Test

Order of Giving the Tests	Alpha Values
1. Giving the C-Test before the X-Test	.839
2. Giving the X-Test before the C-Test	.772
3. Giving the X-Test after the C-Test	.864
4. Giving the C-Test after the X-Test	.869

N = 28 in each test

Results

To answer the first research question, Cronbach's alpha and Pearson correlation were carried out. Table 1 shows the reliability of the C-Test and the X-Test.

Both the C-Test and the X-Test were highly reliable. The highest value was obtained when the students took the C-Test after the X-Test (alpha value = .869) and the lowest value when the students took the X-Test before the C-Test (alpha value = .772).

Table 2

Descriptive Statistics of the C-Test,

the X-Test, Language Proficiency, Language Achievement

and Academic Achievement

Variables	N	X̄	%	SD
When the students took the C-Test first				
1. C-Test	60	41.536	69.227	7.032
2. X-Test	60	41.786	69.643	7.515
3. Proficiency	100	55.786	55.786	12.054
4. Achievement	60	40.321	67.202	7.518
5. GPA		2.893		.725
When the students took the X-Test first				
1. C-Test	60	35.286	58.810	5.912
2. X-Test	60	45.071	75.118	7.081
3. Proficiency	100	57.357	57.357	11.406
4. Achievement	60	40.893	68.155	7.608
5. GPA		2.611		.750

N = 28 in each test

Table 2 presents the descriptive statistics of the C-Test, the X-Test, language proficiency represented by the entrance examination, language achievement represented by the mid-term Foundation English exam and academic achievement represented by GPA.

The results indicate that when the students took the C-Test before taking the X-Test, the means and standard deviations were close. The mean of the C-Test was 41.536 and its standard deviation was 7.032, while those for the X-Test were 41.786 and 7.515, respectively. However, different results were obtained when the students took the X-Test before the C-Test. The mean for the C-Test was 35.286 and the standard deviation was 5.912 while those for the X-Test were 45.071 and 7.081, respectively. This suggests that the order of presenting the C-Test and the X-Test has some

effect on the students' performance. If they were given the C-Test first, they could do the X-Test equally well. However, when the students took the X-Test first, they could do the X-Test better than the C-Test. The mean of the X-Test was 45.071 and the mean of the C-Test was 35.286. The difference may be due to decreased motivation and individual differences of the students which were not controlled in this study.

The intercorrelations among the C-Test, the X-Test, language proficiency, language achievement and academic achievement are presented in Table 3.

When the students took the C-Test first, there were high and rather high significant positive correlations among the variables. The C-Test highly correlated with the achievement test (r = .783) and with the

Table 3

Intercorrelations among the C-Test, the X-Test,

Language Proficiency, Language Achievement and

Academic Achievement

Variables	1	2	3	4	5
When the Students took the C-Test first					
1. C-Test	1.000	.770**	.681**	.783**	.604**
2. X-Test		1.000	.604**	.777**	.713**
3. Proficiency			1.000	.712**	635**
4. Achievement				1.000	.584**
5. GPA					1.000
When the Students took the X-Test first					
1. C-Test	1.000	.640**	.504*	.579**	.440*
2. X-Test		1.000	.627**	.542*	.501*
3. Proficiency			1.000	.799**	.575**
4. Achievement				1.000	.620**
5. GPA					1.000

N = 28 in each test *p ≤ .05 **p ≤ .01

X-Test (r = .770). It correlated less with the proficiency test (r = .681) and with GPA (r = .604). Similarly, the X-Test correlated better with the achievement test (r = .777) and with the C-Test (r = .770) than with the proficiency test (r = .604). However, the X-Test correlated better with GPA than with the C-Test (r = .713). This indicates that the C-Test, the X-Test and the achievement test measure similar abilities, but the X-Test seems to tap academic achievement better than the C-Test.

Although the intercorrelations among the variables were significantly positive when the students took the X-Test first, the correlation coefficient between the C-Test and the X-Test was lower than when the students took the C-Test first. The correlation coefficient was .640. It also correlated less with the proficiency test, the achievement test and GPA. The correlation coefficients were .504, .579 and .440, respectively. The difference was the correlation between the X-Test and

the proficiency test. The correlation coefficient was slightly higher (r = .627).

As regards the order of taking the test, it seems better to give the C-Test before the X-Test. The C-Test is more closely related to the proficiency test and the achievement test than the X-Test. However, the X-Test correlated better with GPA. This may be due to the fact that the X-Test requires cognitive and academic skills as well as reading processing skills more than the C-Test which depends more on orthographic cues.

To answer the second research question, "Are there any significant differences in the gain scores when the C-Test and the X-Test are presented in different orders?", t-test (correlated samples) was employed in the data analysis. Table 4 gives the results.

When the C-Test was presented before the X-Test, there was no significant difference with regard to the gain scores (t = -.270). On the contrary, a significant difference in gain scores was found when the X-Test

Table 4

Differences in the Gain Scores When Presenting the

Different Orders of the C-Test and the X-Test

Variables	$\overline{X}$	SD	t-test
When giving the C-Test before the X-Test			
1. C-Test	41.536	7.032	-.270
2. X-Test	41.786	7.515	
When giving the X-Test before the C-Test			
1. X-Test	45.071	7.081	9.220***
2. C-Test	35.286	5.912	

N = 28***p < .001

was presented first (t = 9.220, p≤.001). The students did better on the X-Test. This might be because the students in the second group were less motivated when they did the C-Test or there might have been individual differences in terms of retention and reading processing skills. However, this conclusion is tentative due to the small number of subjects and the lack of experimental controls.

Conclusions

Both the C-Test and the X-Test were reliable and concurrent validity with the proficiency test, the achievement test and GPA, but the X-Test seems to be more closely related to the cognitive and academic skills than the C-Test. In terms of the order of presenting the tests, the two tests gave different results when different orders were carried out. When presenting the C-Test before the X-Test, there was no significant difference in the gain scores and the students scored about the same. In contrast, when the order was reversed, the students got lower scores. One explanation is lack of motivation. It is also possible that the students might differ in their retention and reading processing skills.

Appendix A
C-Test

Name _____ Faculty _____

Read the following news report and fill in each blank with a letter.

20 injured in road accident in North

Twenty merit makers were injured yesterday, five of them seriously, when the bus they were in smashed into a highway railing on the Tak-Mae Sot highway, causing both rear wheels to be torn off their axle.

The bus, which was hired by 60 employees of a company in Nonthaburi for a katin tour to Kampaengpetch, was on its way back to Bangkok, after a detour to the Thai-Burmese border for sightseeing, when the brakes apparently failed.

After the wheels came off, the bus spun and came to rest on the bridge that crosses the Mae Tor stream in Tak's Muang district. The bus did not hit any other vehicles but blocked the two lanes of the bridge completely.

Traffic was delayed for two hours before highway police were able to use a tow truck to drag the wreckage to the side of the road.

Appendix B
X-Test

Name _____ Faculty _____

Read the following news report and fill in each blank with a letter.

20 injured in road accident in North

Twenty merit makers were injured yesterday, _f_ive of _th_em seriously, _wh_en the _bu_s they _we_re in _sma_shed into _a_ highway _rai_ling on _th_e Tak-Mae Sot _high_way, causing _bo_th rear _whe_els to _be_ torn _of_f their _ax_le.

The _bus_, which _wa_s hired _by_ 60 _emplo_yees of _a_ company _in_ Nonthaburi _fo_r a katin tour _to_ Kampaengpetch, _wa_s on _it_s way _ba_ck to Bangkok, _aft_er a _det_our to _th_e Thai-Burmese _bor_der for _sights_eing, when _th_e brakes _appar_ently failed.

_Aft_er the _whe_els came _of_f, the _bus_ spun _an_d came _to_ rest _on_ the _bri_dge that _cros_ses the Mae Tor _str_eam in Tak's Muang _dist_rict. The _bus_ did _no_t hit _any_ other _vehi_cles but _bloc_ked the _tw_o lanes _of_ the _bri_dge completely.

_Traf_fic was _dela_yed for _tw_o hours _bef_ore highway _po_lice were _ab_le to _us_e a _to_w truck to drag the wreckage to the side of the road.

References

Alderson, J.C. (1979). "The Cloze Procedure and Proficiency in English as a Foreign Language." *TESOL Quarterly*, 13 : 219-227.

Bachman, L.F. (1985). "Performance on Cloze Tests with Fixed-Ratio and Rational Deletions." *TESOL Quarterly*, 19: 535-556.

Boonsathorn, S. (1990). " C-Test/MC-Test as a Tool for Measuring English Proficiency. "Paper presented at Seameo Regional Language Centre on Language Testing and Language Programme Evaluation, April 9-12, 1990 in Singapore.

Klein-Braley, C. and Raatz, U. (1984). "A Survey of research on the C-Test". *Language Testing*, 1: 134-146.

Oller, J.W. Jr. and Perkins, K. (eds.).(1980). *Research in Language Testing*. Rowley, Mass. : Newbury House.

Prapphal, K. (1981). Learning English in Thailand: Affective, Demographic, and Cognitive Factors. Unpublished doctoral dissertation, University of New Mexico, Albuquerque, New Mexico.

Prapphal, K., Pas, K. and Tanapongpipat, S. (1984). "Modified Cloze Tests as Predictive Measures of Language Acquirers and Academic Achievers." *PASAA*. 14: 75-89.

Sigott, G. and Köberl, J. (1993). "Validating the X-Test" In *Language Testing Update*. Issue 14-Autumn 1993 : 53-58.