cy of productive skills included.

Finally, it has been suggested that if one's receptive language skills attrite, his productive skills will inevitably be affected to the same degree (Snow, Padilla & Campbell, 1988, p. 195). Thus, the study of the attrition of participants' receptive skills might mean the same as the study of their productive and receptive skills.

For the above mentioned three reasons, a dictation subtest, a vocabulary subtest, and a reading comprehension subtest are employed in this study to measure participants' listening comprehension skills, lexical knowledge, and reading comprehension skills respectively.

Though aimed at measuring participants' receptive skills, this research can, at the same time, measure their productive skills owing to the use of the dictation subtest, for more and more evidence shows that the general language skills, both receptive and productive, can be measured efficiently by dictation tests, and participants' scores on dictation tests can be viewed as a predictor of their overall language skills (Hughes, 2000; Natalicio, 1979; Oller, 1972b; Stansfield, 1985; Zou, 2007).

3.3 Instrument One: A Diagnostic English Test

In light of English teaching and learning in China and in accordance with the purpose of this research, the author, in developing the subtests and the specific items, endeavors to guarantee that the whole test can provide a good measurement of participants' language skills, have a beneficial implication for future English teaching and learning, and be economical in terms of time and money. In this section, the construction of the subtests and even specific items used as the instruments in this study is to be discussed.

The author always keeps in mind that the participants that he is to study are heterogeneous due to their different educational and professional backgrounds. Of the participants of Groups D and E, some graduated from key state universities directly under the Ministry of Education, others from second-tier universities, and still others from third-tier universities or colleges. The difference results in participants' different performances on the

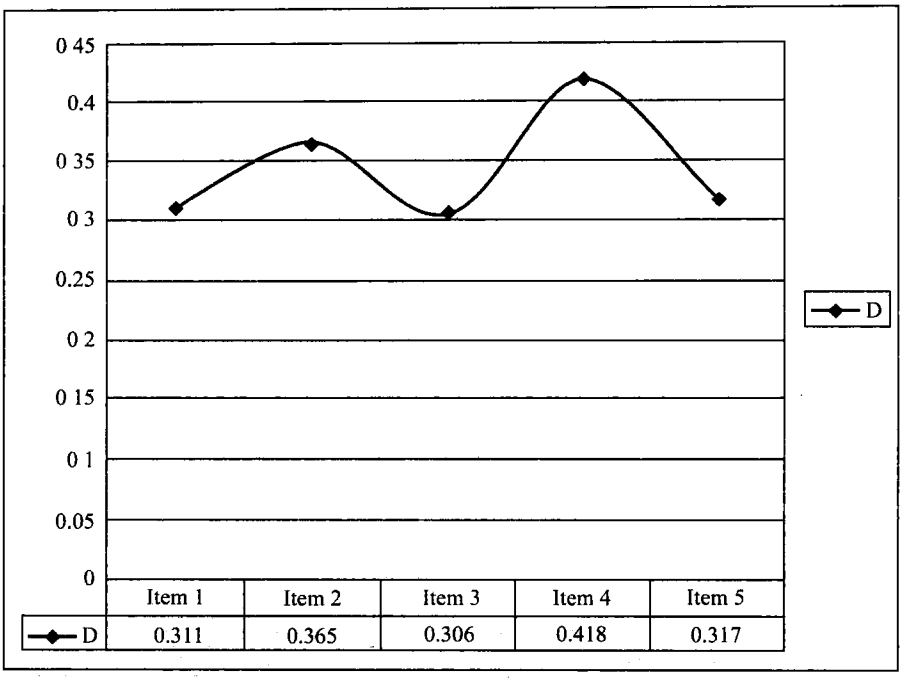

Figure 4. Discrimination indices of items in dictation subtest

Judging from the facility values, the discrimination indices and the reliability of the subtest, and in light of the nature of the participants of Group C and the purposes of the study, the dictation subtest agrees with the design of the research (see Heaton, 2000, pp. 178-182) (see 3. 2, and Tables 1 & 3).

(b) The Vocabulary Subtest

Because the vocabulary subtest was grouped into four different sections according to different levels of difficulty (see 3. 3. 1), the evaluation of the subtest was done in four parts accordingly. Considering the nature of the participants of Group C, the facility values of the items in the subtest will vary from extremely high to very high, to high and to normal in the end, and the discrimination indices from poor to fair, to very good and then to excellent with the rise of the level of difficulty.

The extremely high facility values ($0.884 \leqslant FV \leqslant 0.915$) of the very easy items show that almost all the participants did very well in answering

supposed to have different influences upon the participants' language skill maintenance or attrition. Some must have a greater influence than others. Factor analysis can help make a good distinction of these variables according to their capability of accounting for the participants' language attrition, and reduce these 42 items to a relatively small and manageable number according to the eigenvector value of every item. Then, the smaller number of items could be analysed in greater detail in the discussion of relationship between participants' language attrition and their attitudes.

Table 11 shows that the eigenvalues of the factors are well above 5, much higher than the acceptable value of 1.000 (Qin, 2003, p. 72), and that the cumulative variances of explained variances of the four factors (75.164%) can well account for the variances of the measuring scale of the instrument.

Table 11

Eigenvalues, Explained Variances and Cumulative Variances of Factors of the Questionnaire

Factors	Labels	Eigenvalue	Variance	Cumulative Variance(%)
Factor 1	Participants' attitudes towards English language learning and use	9.009	21.451	21.451
Factor 2	Participants' attitudes towards other English language learners	9.296	22.134	43.585
Factor 3	Participants' interest in the English language	7.775	18.511	62.096
Factor 4	Participants' attitudes towards English language learning	5.489	13.068	75.164

Table 12 shows that factor loadings of all the items in the questionnaire ranging from 0.447 to 0.853 are much higher than the acceptable value of 0.300 (Qin, 2003, p. 72). Consequently, Tables 11 and 12 show that the construct validity of the questionnaire is very good.

tor loadings of all the items ranging from 0. 472 to 0. 785 are higher than the acceptable value of 0. 300. It can therefore be concluded that Section II has high construct validity.

Items 25 and 32 have extremely high factor loadings, and that suggests that more attention should be paid to them in the discussion of the relationship between participants' language attrition and their attitudes towards English language learning.

Table 21

Eigenvalues, Explained Variances and Cumulative Variances of Factors of Participants' Attitudes towards English Language Learning

Factors	Eigenvalues	Variances	Cumulative Variances (%)
Factor 1	3. 122	31. 224	31. 224
Factor 2	1. 942	19. 421	50. 645
Factor 3	1. 872	18. 724	69. 369

Table 22

Loadings of Items of Participants' Attitudes towards English Language Learning

Factors	Items	Loadings	Communalities
Factor 1	Item 37	0. 878	0. 835
	Item 33	0. 839	0. 778
	Item 34	0. 783	0. 744
	Item 36	0. 742	0. 677
Factor 2	Item 41	0. 751	0. 649
	Item 39	0. 743	0. 569
	Item 40	0. 515	0. 504
Factor 3	Item 42	0. 827	0. 762
	Item 35	0. 739	0. 750
	Item 38	0. 603	0. 670

Subtest	Within Groups	525.305	717	0.733		
	Total	683.296	719			
Reading	Between Groups	84.498	2	42.249	60.231	.000
Comprehension	Within Groups	501.538	715	0.701		
Subtest	Total	586.036	717			

Table 29 shows that for the dictation, the vocabulary, the reading comprehension subsets, there are significant differences between any two groups (Groups E and D; Groups E and C; Groups D and C) (Fisher's least significant differences (LSD) *post hoc* test, $p<0.05$). Table 28 shows that these differences are not due to random sampling ($F_D=373.780$, $p<0.001$; $F_V=107.823$, $p<0.001$; $F_R=60.231$, $p<0.001$).

Table 29

Post hoc Test: Multiple Comparisons of Differences of Standard Scores of Three Subtests between Groups C, D and E

Dependent Variable	(I) group	(J) group	Mean Difference (I-J)	*Sig.*
Dictation Subtest	Group E	Group D	-1.453	.000
	Group E	Group C	-1.647	.000
	Group D	Group C	-0.194	.003
Vocabulary Subtest	Group E	Group D	-0.151	.049
	Group E	Group C	-0.791	.000
	Group D	Group C	-0.640	.000
Reading Comprehension Subtest	Group E	Group D	-0.333	.000
	Group E	Group C	-0.785	.000
	Group D	Group C	-1.117	.000

* The mean difference is significant at the .05 level.

4.3 Order of Attrition

The third research question of this study is in what order attrition develops. Does attrition develop just as our intuition tells us or as the regression hypothesis (Jakobson, 1941, p. 93) predicts? In other words, will what is learned first be retained last, or is the order of attrition reverse to the order of acquisition?

Both the vocabulary and the reading comprehension subtests have a very wide range of difficulty (see 3.3.1 and Table 2). The unique subtests were developed in order to find whether graduate participants of Groups D and E had a good performance on the easier and the easy items, and whether they obtained very low scores on the difficult and the very difficult items. If the answers to these questions are affirmative, it can be concluded that English attrition progresses in such an order as is reverse to the order of acquisition.

Before the exploration of the order of attrition, it needs to be clarified that in the specific English teaching and learning situation in China, the least complex and easiest-to-command language skills are acquired earlier than the most complex and most difficult-to-command ones. The understanding of such a situation is to be of great help in revealing the relationship between the order of attrition and the order of acquisition in that before the comparison between these two orders can be made, the order of acquisition should be made clear.

4.3.1 At the Level of Subtests

Table 30 and Figure 34 show that among the participants of the five groups, those of Group C scored the highest regardless of the level of difficulty of items. The relatively flat parabolas formed by the means of the easier and the easy items show that the participants had a comparatively good retention of the early-acquired and easy-to-command language skills. That is to say, what is learned first is retained last. The tilted parabolas based upon the means of the difficult and the very difficult items mean that participants had a comparatively poor maintenance of the late-acquired complex and

4.4.1 Correlation between Total Test Score and Total Questionnaire Score

Table 33

Descriptive Statistics: Groups D and E

	Mean	Std. Deviation	N
Total Test Score	55.27	10.011	478
Total Questionnaire Score	157.07	22.161	478

Table 34 shows that 50.8% ($r^2 = 0.508$) of variation in participants' test performances can be accounted for by the variation of their attitudes and motivations. However, it is too early to conclude that language attitudes of the graduate participants play an important role in the attrition or the maintenance of their English skills. Before that conclusion can be drawn, the regression analysis should be conducted to verify whether there is a close cause-and-effect relation between the participants' language attitudes and language maintenance.

Table 34

Correlation Analysis between Participants' Language Maintenance and Their Language Attitudes

Pearson Correlation	Total Questionnaire Score
Total Test Score	.713(**)

** Correlation is significant at the 0.01 level (2-tailed).

The regression equation for the above data in Table 35 is:

Total Test Score = 33.463 + 0.307 × Total Questionnaire Score

Table 37

Correlation Analysis between Participants' Language Maintenance and Their Scores on Two Parts of the Questionnaire

	Total Test Score
Participants' idea of English language learning and use	.705(**)
Participants' attitudes towards the English language	.740(**)

** Correlation is significant at the 0.01 level (2-tailed).

The regression equation for the above data in Table 38 is:

Total Test Score = 3.774 + 0.196 × the score of Part I + 0.248 × the score of Part II

Table 38

Results of the Multiple Regression Analysis: Language Maintenance and the Two Parts of the Questionnaire

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	*Sig.*
		B	Std. Error	*β*		
1	(Constant)	3.774	0.223		20.478	.000
	Participants' idea of English language learning and use	.196	0.092	.242	11.899	.000
	Participants' attitudes towards the English language	.248	0.044	.275	12.824	.000

The first term in the prediction equation (3.774) is a constant that represents the predicted criterion value when both predictors equal zero. The values of 0.196 and 0.248 represent regression weights or regression coefficients. Multiplying an individual's score of Part I and score of Part II by the appropriate regression coefficients gives the predictor variable the statistical-

Table 51

One Way ANOVA for Regressions: Participants' Language Maintenance and Their Interest in the English Language

Model		Sum of Squares	*df*	Mean Square	*F*	*Sig.*
1	Regression	3191.893	1	3191.893	34.057	.000
	Residual	44612.348	476	93.723		
	Total	47804.241	477			

Table 52 indicates a positive correlation between the two variables. The correlation coefficient is 0.761, indicating a strong relationship between the participants' total test score and their attitudes towards English language learning. It can be concluded that the variation in the participants' language maintenance can be accounted for by the variation of their interest in the English language at the level of 57.9% ($r^2=0.579$, $p<0.01$).

Table 52

Correlation Analysis between Participants' Language Maintenance and Their Attitudes towards English Language Learning

	Total Test Score
Participants' attitudes towards English language learning	.761(**)

** Correlation is significant at the 0.01 level (2-tailed).

It can seen from Tables 52 and 53 that the participants' total test score is positively related to their attitudes towards English language learning, but also significantly, and as such, it would probably be worth the time and expense for the participants to develop a positive attitude towards English learning.

Table 60

Results of the Regression Analysis: Listening Comprehension Skill Maintenance and Total Questionnaire Score

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	*Sig.*
		B	Std. Error	*β*		
1	(Constant)	-23.891	9.583		-19.614	.000
	Questionnaire	.530	0.060	.872	28.771	.000

The regression equation for the above data in Table 60 is:

Total Dictation Score=-23.891+0.530×Total Questionnaire Score

The first term in the prediction equation (-23.891) is a constant that represents the predicted criterion value when the predictor equals zero. The value of 0.530 represents regression weight. Multiplying the total questionnaire score by the appropriate regression coefficient gives the predictor variable the statistically determined proper amount of weighting in predicting the total dictation score. The score of the total questionnaire is a predictor of the score of the dictation subtest ($t=28.771$, $p<0.001$).

The p column in Table 61 also shows that the observed F ratio is larger than the F critical value ($p<0.001$). Therefore, it can be concluded from the analysis that the regression effect for the total questionnaire score is greater than zero, and thus the total questionnaire score may be a predictor ($F=76.907$, $p<0.001$).

Table 66

Results of the Regression Analysis: Reading Comprehension Skill Maintenance and Total Questionnaire Score

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	*Sig.*
		B	Std. Error	*β*		
1	(Constant)	-20.416	2.91		-18.254	.000
	Questionnaire	.367	0.023	.604	26.943	.000

The regression equation for the above data in Table 66 is:

Total Reading Comprehension Score = -20.416 + 0.367 × Total Questionnaire Score

The first term in the prediction equation (-20.416) is a constant that represents the predicted criterion value when the predictor equals zero. The value of 0.367 represents regression weight. Multiplying the total questionnaire score by the appropriate regression coefficient gives the predictor variable the statistically determined proper amount of weighting in predicting the total reading comprehension score. The score of the total questionnaire is a predictor of the score of the reading comprehension score ($t=26.943$, $p<0.001$).

The p column in Table 67 also shows that the observed F ratio is larger than the F critical value ($p<0.001$). Therefore, it can be concluded from the analysis that the regression effect for the total questionnaire score is greater than zero, and thus the total questionnaire score may be a predictor ($F=71.085$, $p<0.001$).

Based upon a constant and one or more β values, many predicting formulas can be established. All these established formulas can be employed to predict the participants' language attrition according to their responses to the questionnaire. All this favourably confirmed Gardner's repeatedly stressed speculation (1982b, p. 32) of the important role that attitudes and motivation play in language attrition: "Attitudinal/motivational variables could also influence second language retention by orienting the individual to take every opportunity to maintain proficiency in the language."

guage, is of the Indo-European language family, and more often than not, the second or foreign language is of the same language family as the participants' mother tongue. This situation means the participants' mother tongue might beneficially retard or even stem the attrition of the disused second or foreign language. However, Chinese, the mother tongue of the participants in this study, can not provide them with any favorable support in retarding or stabilizing their English language skills because Chinese and English are of different language families.

5.1.2 Attrition of Different Language Skills

This research is also aimed at studying attrition of three kinds of language skills of the participants, that is, listening comprehension skills, lexical knowledge, and reading comprehension skills.

The comparison of the standardized means of the dictation subtest scores of the participants of Groups C, D and E ($\overline{X}_C = 76.10$, $\overline{X}_D = 69.80$, $\overline{X}_E = 60.30$, $F_D = 373.780$, $p < 0.001$) shows obvious attrition of the listening comprehension skills of the participants of Groups D and E (see Tables 27 & 28 and Figure 28). Moreover, the high correlation between participants' performances on the whole test and the dictation subtest ($r = 0.786$, $p < 0.01$) means that the participants' scores in the dictation subtest are a predictor of maintenance of general language skills.

Another two comparisons of the standardized means of the vocabulary subtest scores ($\overline{X}_C = 74.15$, $\overline{X}_D = 67.75$, $\overline{X}_E = 65.30$, $F_D = 107.823$, $p < 0.001$) and the reading comprehension subtest scores ($\overline{X}_C = 75.71$, $\overline{X}_D = 67.87$, $\overline{X}_E = 66.50$, $F_D = 60.231$, $p < 0.001$) show a tendency of attrition of both lexical knowledge and reading comprehension skills of the graduate participants (see Table 27 and Figure 28). This study also shows that the attrition of different language skills of different groups of participants develops at different speeds: in the participants of Group D, the reading comprehension skills attrite fastest and the listening comprehension skills have a relatively good retention, while among the participants of Group E, the listening comprehension skills attrite fastest, and the lexical knowledge is comparatively well maintained.

the combined effort of English teachers, students, and even the whole society to teach and learn English as a foreign language is made in vain. Faced with such a serious situation of English attrition, all the parties involved in English teaching and learning in China should make more effort to seek for the methods to teach and learn English in a way that the acquired language could be immune to attrition, and to find the ways to help college graduates to prevent attrition or at least to slow down the process of attrition.

5.2.2 Attrition of Different Language Skills

As far as attrition of different language skills is concerned, the participants' lexical knowledge is the most vulnerable. This study shows that the lexical knowledge of the participants of Group D attrites to such a degree that the lexical knowledge that they had acquired in the last seven semesters has been completely lost. The study predicts that the participants of Group E have lost all the lexical knowledge that had been obtained after the last semester of their high school academic years, supposing that the acquisition of the lexical knowledge develops in the same way in high school as in college. The drastic attrition of lexical knowledge might have many reasons, such as the disuse of and nonexposure to it. However, a widely-accepted reason is that most of the lexical knowledge is not acquired in an interconnected way. The knowledge that is not acquired in the interconnected way is usually "isolated" and less-connected to a "structured system of relationships" and is easily forgotten (Neisser, 1984, p. 34). Thus, it can be argued that the better connected the knowledge is, the longer it will be retained. This argument complements the "best learned, last forgotten" hypothesis because the best learned knowledge is more likely to be better connected with other knowledge or information.

This study finds that of the three language skills, the listening comprehension skills perform relatively well in resisting attrition. The participants of Group D still keep the listening comprehension skills they had acquired in their first two college semesters and the participants of Group E still retain traces of their listening comprehension skills acquired at the beginning of their first college semester. The reason might be that listening comprehen-