

The Effects of Test Anxiety, Testwiseness and Pre-Exam Coaching on Test Performance of Insurance Agent Applicants¹

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Test-taking behavior has received considerable attention by educators and psychologists. Interesting aspects of the study of the test-taking behavior are the effects of test anxiety, testwiseness and pre-exam coaching upon test scores (Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960; I. G. Sarason, 1961; Felhdusen and Klausmeier, 1962; French, 1962; Slakter, Koehler and Hampton, 1970; Roberts and Oppenheim, 1968; Dyer, 1953; Jones, 1954; and Jacobs, 1966). Some similarities of these studies in test-taking behavior are: (1) each investigator centered his interest around classroom situations; (2) each problem of test-taking behavior has been investigated separately; and (3) the subjects of each study are either young school children or college students. These similarities suggest several limitations. They do not provide comprehensive knowledge of test-taking behavior. Further, information about test-taking behavior outside of school situations in which the majority of ordinary citizens do not live is lacking.

The purpose of the present study was to investigate the effects of test anxiety (TA), testwiseness (TW) and pre-exam coaching (PC) upon adult applicants' test scores on the Oregon Life and Health Combined Insurance License Examination (OLHCILE). More specifically, several hypotheses were tested in the present study:

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1. It was predicted that low anxiety group would achieve higher test score than high anxiety group.
2. It was hypothesized that the advanced knowledge TW group would obtain higher test score than the less knowledge TW group.
3. A significant difference between the means scores on the OLHCILE earned by different PC groups was expected.
4. It was expected that there are significant interactions between TA and PC, between TA and TW, between TW and PC, and interaction among TA, TW, and PC.

Method

Subjects

Subjects used for the study were 227 new agent applicants who had taken the OLHCILE from September to December, 1972. The modified Test Anxiety Scale (TAS) was then given to the Ss. The highest and lowest one-thirds with respect to scores on the TAS of all Ss constituted the high and low test anxiety groups. Of 148 subjects, twelve subsamples were selected which provided unbalanced n's for twelve treatment combinations. These combinations represented the test anxiety, testwiseness and pre-exam coaching variables. The selected subjects had eight to nineteen years of formal education prior to their taking the examination. Their ages at the time of their taking the test ranged from 18 to 57 years, with a median age of 37.5. Only about three per cent of the selected subjects was female.

The Measures

OLHCILE has 50 true-false and 50 multiple-choice questions. It is given twice a week in Oregon. The first one is at 1:00 p. m. on Wednesdays in Salem, and the other is at 9:30 a. m. on Fridays in Portland. No time limits to complete examination are imposed. Its alternate-form reliability coefficient was reported as .69 with 100 applicants in other study (Hwang, 1973). The items had undergone item analysis in previous testings. For the OLHCILE (Form 1), the item-total point biserial correlation failed to be significant for only 10 of the 100 items. The content areas covered in the OLHCILE included insurance laws and product knowledge.

TAS used for this study has twelve 'Yes-No' statements. They were selected from Test Anxiety Scale for Children (Sarason, et al., 1960) and rewritten to fit industrial testing condition. Example: "Do you sometimes dream that your manager

or supervisor is angry because you do not know your lesson?" The reliability coefficient, obtained by retesting 36 of the agent applicants in previous testings one week after they took the TAS, was .72.

Procedures

Immediately prior to taking their OLHCILE (Form 1), the entire subjects were given the TAS and questionnaire for pre-exam coaching. To give the TAS, the instruction was made: "Place a check mark under either Yes or No to show your feelings regarding each of the following statements." In order to get the subjects' cooperation to complete the questionnaire for pre-exam coaching, the following instruction was also given by the examiner: "Please complete this questionnaire before you take your examination. Be as accurate as you can. The questionnaire will not affect your grade, but the information obtained will be important to the department and to your company in future examination given."

Pre-exam coaching (PC) in the present study was defined as the number of instructional hours prior to his taking the test that the new agent applicant received in preparing from persons already licensed. PC was further classified into three levels: (1) total self-study with no instructed study (PC1); (2) self-study with less than 10 hours instructed study (PC2); and (3) self-study with more than 10 hours instructed study (PC3).

The testing days were randomly selected for giving the knowledge of testwise-ness. Immediately after their completing the TAS and questionnaire, all Ss on those selected days (TW2) were given a simplified outline of testwiseness principles based upon work by Millman, Bishop and Ebel (1965). This Simplified outline was included in the instructions for the OLHCILE given by the examiner.

Analytical Design

The present results were amenable to a three-way analysis of variance (two test anxiety levels by two testwiseness levels by three pre-exam coaching levels). Because of unequal or unbalanced n's in each cell of this three-way ANOVA, a general linear hypothesis model was used. The data were analyzed and computed by computer program (BMD05V) at the University of Oregon.

Because this was an exploratory study of test-taking behavior on adult's test performance, the consequences of Type I error would appear to be more serious than Type II error. Thus, a relatively high level of significance for statistical tests ($\alpha=0.01$) was used throughout the analyses.

Results

The means and standard deviations, respectively, for each of the twelve groups used in the analysis are reported in Table 1. Table 2 summarizes three-way analysis of variance of OLHCILE scores. The obtained F ratio (10.79) indicated a

TABLE 1
 Characteristics of Cell Summary for A $2 \times 2 \times 3$ Factorial
 Design Representing Test Anxiety, Testwiseness and
 Pre-exam Coaching for OLHCILE Scores

Cell*	N	M	SD
(111)	8	84.5	5.48
(112)	14	83.1	4.97
(113)	7	78.7	5.73
(121)	9	78.0	7.84
(122)	20	83.1	6.37
(123)	16	86.4	8.85
(211)	6	84.3	7.00
(212)	17	87.9	4.59
(213)	6	85.7	7.45
(221)	9	85.6	6.35
(222)	24	83.3	9.11
(223)	12	92.1	5.14

*The data were represented in the form as X_{ijk} , where $i=1,2$ (The first variable, test anxiety: HA, LA) $j=1,2$ (The second variable, testwiseness: TW1, TW2) $k=1,2,3$ (The third variable, pre-exam coaching: PC1, PC2, PC3)

significant difference between high and low test anxiety groups in the OLHCILE scores at the .01 level. The obtained F ratio (6.09) also showed a significant interaction between testwiseness (TW) and pre-exam-coaching (PC).

Since the interaction between TW and PC was significant, the simple main effects of TW at the levels of PC, and PC at the levels of TW were investigated. The results are presented in Table 3. They revealed a significant

TABLE 2
Three-way Analysis of Variance of OLHCILE Scores

Source	df	MS	F
Test Anxiety (TA)	1	520.00	10.79*
Testwiseness (TW)	1	15.00	0.31
Pre-exam Coaching (PC)	2	57.50	1.19
TA × TW	1	3.00	0.06
TA × PC	2	44.50	0.92
TW × PC	2	293.50	6.09*
TA × TW × PC	2	103.00	2.14
Within Cells	136	48.19	

*p<.01.

TABLE 3
Analysis of Variance of the Simple Main Effects for
TW and PC on the OLHCILE Scores

Source	df	MS	F
Testwiseness (TW)	1	15.00	0.31
TW at PC1	1	56.10	1.16
TW at PC2	1	118.97	2.47
TW at PC3	1	426.93	8.86*
Pre-exam Coaching (PC)	2	57.50	1.19
PC at TW1	2	67.35	1.39
PC at TW2	2	283.65	5.89*
TW × PC	2	293.50	6.09*
Within Cells	136	48.19	

*p<.01.

difference between the levels of knowledge of testwiseness for groups at the highest level of pre-exam coaching ($F=8.86$). Similarly, the obtained F ratio (5.89) yielded a significant difference between the levels of pre-exam coaching for groups at the advanced level of testwiseness. In order to show these interactions more clearly, two profiles were drawn and are given as Figures 1 and 2.

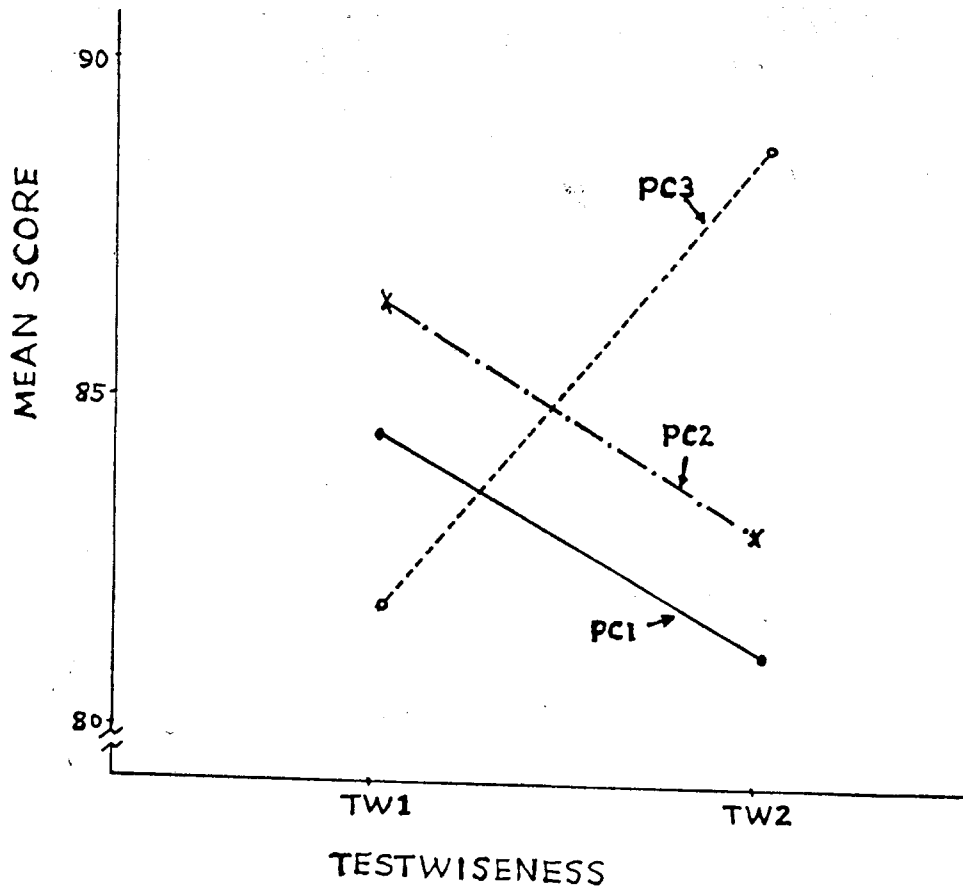


Figure 1. Profile of Simple Main Effects for Testwiseness

Discussion

In the present study a significant difference was found between test performance of high and low test anxiety groups. The low test anxiety group did a better performance on the OLHCILE than the high test anxiety group. This finding was consistent with Sarason et al. (1960), I. G. Sarason (1961), and

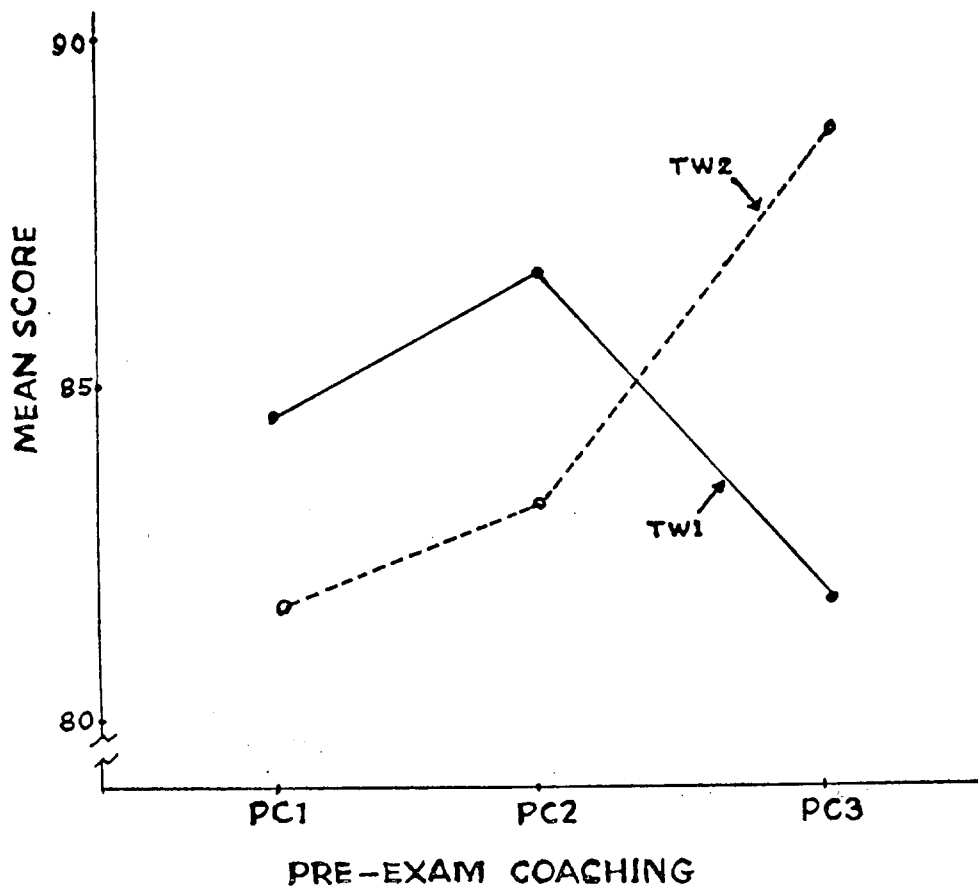


Figure 2. Profile of Simple Main Effects for Pre-exam Coaching

Felhdusen and Klausmeier (1962). One might speculate that the OLHCILE is a complex task to those adult insurance agent applicants under industrial testing condition. Although anxiety was found to accompany low test scores for this study, it did not prove anything about the part that anxiety played in bringing about the low scores. However, it is possible that the low-scoring subjects who were high anxious could be due to lack of mastery of the subject-matter in preparing for the test. Because those who are lack of mastery of the subject-matter might be the persons who have less confidence in passing the OLHCILE. When they thought that if they could not pass this test, they would not become insurance salemen right away, and should wait a period of three more months for preparing another test again without any salary from their working insurance companies. They

became more anxious which interfered their performance on the test. Thus, the appraisal of mastery of the subject-matter and characteristics of the insurance applicants should be taken into consideration for further research.

The hypothesis that the advanced knowledge TW group would obtain higher test score than the less knowledge TW group was failed to be significant. One possibility might be that the subjects are adults who have gone through many objective tests. Each subject has already had rich knowledge of testwiseness prior to taking this license examination. Therefore, the treatment of giving a simplified outline of testwiseness to the advanced knowledge TW group did not make a significant contribution. Another possibility could be due to lack of controlling unexpected factor. For example, some examinees in the less knowledge TW group often raised questions to ask how to take test. The test assistant who is a legal government officer could not refuse giving the answer. This was not supposed to be occurred during the experimentation, and could be detrimental to the predicted result.

The expectation that a significant difference between the means scores on the OLHCILE earned by different PC groups was not confirmed. This could be due to lack of the more precise and detailed classification of the PC category. For further study, the PC category should be classified into five levels: (1) total self-study with no instructed study; (2) less than 40 hours self-study with less than 10 hours instructed study; (3) less than 40 hours self-study with more 10 hours instructed study; (4) more than 40 hours self-study with less 10 hours instructed study and (5) more than 40 hours self-study with more than 10 hours instructed study.

The expectation that a significant interaction between testwiseness and pre-exam coaching was confirmed. The significant simple effect for testwiseness suggests that the above interaction effect was due to the contribution of testwiseness interacted with the highest level of pre-exam coaching. Similarly, pre-exam coaching interacted with the advanced level of testwiseness made a significant contribution to the interaction between testwiseness and pre-exam coaching. This explains the fact that the more hours has been spent by the examinee in preparing the test, he is expected to gain more knowledge of testwiseness on the objective tests. Also, it can be inferred that testwiseness interacted with pre-exam coaching affects the adult insurance applicants' test performance.

Additional studies involving various other agent licensing examinations are

planned as more data become available with time. These studies should undertake the assessment of mastery of the subject-matter and differing characteristics of the examinees.

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