

DTIC FILE COPY

AD-A184 077

The Development of Valid Performance Measures
for the 76C AIT Course
(Equipment Records and Parts Specialist)

Stephen Cormier

Training and Simulation Technical Area
Robert J. Seidel, Chief

Training Research Laboratory
Jack H. Hiller, Director



U. S. Army

Research Institute for the Behavioral and Social Sciences

June 1987

Approved for public release; distribution unlimited.

DTIC
ELECTE
AUG 31 1987
S D
E

87 8 25 178

U. S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

A Field Operating Agency under the Jurisdiction of the
Deputy Chief of Staff for Personnel

EDGAR M. JOHNSON
Technical Director

WM. DARRYL HENDERSON
COL, IN
Commanding

Technical Review by

Douglas Dressel
Joseph D. Hagman

| | |
|--------------------|-------------------------------------|
| Accession For | |
| NTIS GRA&I | <input checked="" type="checkbox"/> |
| DTIC TAB | <input type="checkbox"/> |
| Unannounced | <input type="checkbox"/> |
| Justification | |
| By _____ | |
| Distribution/ | |
| Availability Codes | |
| Dist | Avail and/or Special |
| A-1 | |



This report has been cleared for release to the Defense Technical Information Center (DTIC). It has been given no other primary distribution and will be available to requestors only through DTIC or other reference services such as the National Technical Information Service (NTIS). The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other official documentation.

| REPORT DOCUMENTATION PAGE | | READ INSTRUCTIONS BEFORE COMPLETING FORM |
|---|-----------------------|---|
| 1. REPORT NUMBER ARI Research Note 87-31 | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER |
| 4. TITLE (and Subtitle) THE DEVELOPMENT OF VALID PERFORMANCE MEASURES FOR THE 76C AIT COURSE (EQUIPMENT RECORDS AND PARTS SPECIALIST) | | 5. TYPE OF REPORT & PERIOD COVERED Final Period ending June 1987 |
| | | 6. PERFORMING ORG. REPORT NUMBER --- |
| 7. AUTHOR(s) Stephen Cormier | | 8. CONTRACT OR GRANT NUMBER(s) --- |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army Research Institute for the Behavioral and Social Sciences, 5001 Eisenhower Avenue Alexandria, Virginia 22333-5600 | | 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 2A263743A794 333H1 |
| 11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Research Institute for the Behavioral and Social Sciences, 5001 Eisenhower Avenue Alexandria, Virginia 22333-5600 | | 12. REPORT DATE June 1987 |
| | | 13. NUMBER OF PAGES 19 |
| 14. MONITORING AGENCY NAME & ADDRESS (If different from Controlling Office) --- | | 15. SECURITY CLASS. (of this report) Unclassified |
| | | 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE --- |
| 16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited. | | |
| 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) --- | | |
| 18. SUPPLEMENTARY NOTES Prepared as part of the Training Technology Field Activity with the U.S. Army Quartermaster School, Fort Lee, Virginia, and The TRADOC Training Technology Agency. | | |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Performance measures PLL clerk Quartermaster School Test validation | | |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report describes a methodology for producing validated end-of-cycle tests for Advanced Individual Training (AIT) courses at the Quartermaster School, Fort Lee, VA. Specifically, the methodology is presented for the four major duty positions of the 76C MOS (Equipment Records and Parts Specialist). This methodology can be applied to other AIT courses/schools to assure development of valid diagnostic performance measures. | | |

Research Note 87-31

**The Development of Valid Performance Measures
for the 76C AIT Course
(Equipment Records and Parts Specialist)**

Stephen Cormier

Training and Simulation Technical Area
Robert J. Seidel, Chief

**Training Research Laboratory
Jack H. Hiller, Director**

U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES
5001 Eisenhower Avenue, Alexandria, Virginia 22333-5800

Office, Deputy Chief of Staff for Personnel
Department of the Army

June 1987

Army Project Number
2Q263743A794

Education and Training

Approved for public release; distribution unlimited.

FOREWORD

Training Technology Field Activities (TTFAs) have the mission of developing and implementing training technology in the Army. Each TTFA is a partnership effort consisting of the Army Research Institute (ARI), and the U.S. Army TRADOC Training Technology Agency (TTA), and an Army school or other training organization. The Fort Lee TTFA has as a third partner, the U.S. Army Quartermaster School (QMS). The focus for the initial development and implementation effort is the 76C10 course (Equipment Records and Parts Specialist).

An early, mutually recognized need was to develop procedures for improved 76C performance measurement. This serves two objectives. First, it permits monitoring of student performance over time to determine if the introduction of training technology is having the desired effect--improvement of student performance. Second, when introduced in conjunction with an automated system, it will reduce instructor workload while improving the diagnosis of student problems. This report describes the development of those procedures.

The research was performed by the Training and Simulation Technical Area, Training Research Laboratory, under Research Task 3.3.3., Application of Technology to Meet Supply Skills Training Needs. It is in response to a Memorandum of Agreement between TRADOC, ARI, and QMS (Establishment of a Training Technology Field Activity, Fort Lee, VA) dated 6 January 1984. Results were briefed to representatives of the Quartermaster School and TRADOC TTA on 23 April 1987. Planning for implementation of the testing procedures in the 76C course is underway.

INTRODUCTION

Background

As part of the on-going Training Technology Field Activity (TTFA) at the Quartermaster School (Fort Lee), new training methods and technologies are being applied to the 76C Equipment Records and Parts Specialist Advanced Individual Training (AIT) course and to on-the-job training in the 76C MOS. In this situation, the accurate assessment of the impact of these course modifications on trainee performance in the school and on the job is essential. In order to measure the effects of such course changes performance measures must be developed, when not in existence, which can provide a valid index of trainee skills.

The development of performance measures for the 76C AIT should be conducted with several objectives in mind. First, the performance measure should reliably reflect the trainee's ability to perform the critical tasks established by the Quartermaster School. Secondly, an evaluation should be conducted to determine whether additional job tasks are critical for successful performance and if so, will the performance measures reliably assess trainee knowledge in these areas. Third, the performance measures need to be scorable in a consistent, objective fashion. This is particularly the case if these measures are to be placed within a computer-managed instructional (CMI) system in which trainees would take the test on a computer which would score it automatically. Fourth, it would be desirable for the tests to have some predictive utility in assessing the level of performance which the trainee will exhibit on the job.

The whole question of the validity or predictive utility of 76C performance tests is an important element in reducing what has become known as the transition problem. As Keese et al (1980) have noted, the transition from 76C AIT to performing in the unit has proven difficult for 76C trainees. There are several apparent reasons for the transition problem: (1) 76C AIT graduates often work by themselves in a motor pool and have no one to go to for answers about supply procedures, (2) post-specific (local) procedures for ordering parts and maintaining a prescribed load list (PLL) create some divergence between what 76C trainees have been taught and what they must actually do, and (3) there is a low system tolerance for error in parts orders.

Valid performance tests, based on front-end analyses, can help reduce the difficulty of school-to-unit transition by accurately assessing deficiencies in trainee knowledges and skills essential for successful job

performance under the aforementioned conditions. In addition, the performance test can guide the development of appropriate instructional materials to insure that training is given on the requisite jobs skills.

This report: (1) presents a methodology for the construction of section or annex tests for the four major 76C duty positions,¹ (2) describes the application of the methodology as used in the development of duty position tests, and (3) describes an example test plan and validation procedures for use in future test development.

Methodology for 76C Test Construction

Job Analysis

The initial step in test development is an analysis of the entry level job which trainees will be expected to perform. Keese et al (1980) note that the 76C AIT graduate is expected to perform as a journeyman because their supervisor is not in the same MOS (e.g., a 76Y or motor pool sergeant) and is not necessarily at a higher skill level. While this makes it more difficult for the trainee when first assigned to a unit, it obviates the necessity for distinguishing between the tasks performed by 76C clerks with different levels of experience since they are all assigned the same tasks.

The Supply and Service Career Management Field, including the 76C MOS, has been the focus of a number of recent job and task analyses (Hughes Aircraft, 1981; Duncan, 1984; TRADOC, 1983). Thus, it was unnecessary to conduct a separate job analysis for the current project. However, in order to clarify certain aspects of the task environment, interviews were conducted with several PLL/TAMMS clerks at Fort Lee and Fort Carson as well as with instructors in the 76C AIT program at the Quartermaster School.

The most useful job analysis for the current purpose is the job analysis described in Duncan (1984) which was conducted by RCA Services and Educational Testing Service as part of the Baseline Skills Education Project (BSEP). Critical tasks were analyzed in Skill Level 10 and 20 for the 94 highest density MOSs including 76C. The objective was to identify prerequisite competencies or skills needed for successful performance of the critical tasks in each MOS. Task lists were developed from existing materials such as course manuals and task lists from proponent schools. In conjunction with subject matter experts (SME) the job analysis identified: (1) the specific job or performance steps required to perform each task, (2) the equipment required, (3) the knowledges and skills necessary and, (4) the standards to which the completed tasks should conform. Discrepancies between actual field performance and doctrinal procedures were noted and researched.

¹The four duty positions are Prescribed Load List (PLL) Clerk, The Automated Motor Maintenance System (TAMMS) Clerk, Shop Clerk, and Shop Stock Clerk.

The results of the job analyses mentioned previously indicate that several aspects of the job environment cause particular problems. The lack of adequate supervisory technical expertise means that the 76C must be more proficient at finding information in technical manuals. Also the differences between school and local post procedures increase the importance of the 76C having a better understanding of the nature and rationale of their job activities. Many of the differences between school and job practices can be easily accommodated if the nature of the activity is well understood. However, because current training emphasizes that record keeping and supply procedures are to be performed in one specific way, there is interference when AIT graduates have to perform the activity in a slightly different way. In addition, the AIT graduates express concern about the differences because they believe that the procedures taught in school are the only correct way of performing these activities. In consideration of these points, it would seem important to test trainee performance on job comprehension, ability to look up information, and the degree to which minor variations in procedures can be assimilated without undue disruption in addition to the basic subject matter of supply form completion. These considerations in tandem with the job procedures themselves will guide the formulation of types of items that can best measure the knowledges, skills and abilities (KSAs) essential to successful 76C performance.

To ensure the performance tests accurately reflect the full domain of 76C tasks and functions, test plans should be constructed for each of the annexes of the AIT course. The test plan specifies the knowledge and task domain which is to be covered, the type of test, items to be used, and the length and overall structure of the test. In the present case, the test plans are meant to serve as the model for end-of-annex and end-of-course test construction.

The test plans provide a division of the duty positions into functional areas (the columns of the test plan matrix) and the knowledges and actions required to correctly perform those functions (the rows of the test plan). A more complete description will be provided in a later publication entitled Test Plan for the 76C AIT Duty Position Annexes, but a brief example here should clarify their role in guiding performance measurement.

In looking at the test plan for the PLL manual annex (Figure 1), the main functional area tasks of the duty position can be seen in the column headings, e.g., Request for issue of national stock number (NSN) parts. The row headings indicate the possible knowledges and activities required to successfully perform these functions, e.g. definitions of terms or how to post the information from one supply document to another. The cells of the matrix cover the entire domain of the PLL manual job. (It should be noted that not all of the cells are meaningful, e.g. repairable exchange of parts does not involve postings).

Information in Appendix A and materials available from the author provide a compilation of data extracted from the on-line data base developed for the BSEP project. The critical tasks for the 76C MOS are listed in Appendix A. The component elements for each of the critical tasks are available upon request. These component elements are paired with the codes for the prerequisite competencies and the corresponding codes are also available upon request.

Test Plan Development

Given the identification of the critical tasks and the skills required for their performance, the next step is the development of the test plan. The test plan can be considered as a template for the construction of alternate versions of a particular performance test so that there is a high degree of content consistency between alternate versions. When the content of the performance test closely resembles and samples actual job tasks and duties (i.e., possesses content validity) the linkage between the items used in the tests and the tasks/duties of the job does not require the documentation (e.g. SME panel ratings) that would be necessary if the items were more abstractly related to job performance (e.g., aptitude tests).

The test plan specifies the kind and number of items which will be used to measure trainees' knowledge of how to perform the identified critical tasks and the skills associated with their successful performance. In the present case, the BSEP study identified 39 critical tasks for the 76C MOS which cover the four duty positions of the 76C MOS. In any one annex therefore, the number of critical tasks to be covered is only a part of the total of 39 tasks. This allows the performance test for each course annex to contain a complete representation of the relevant critical tasks.

The content of the end-of-annex tests must be based on the information taught in the annex. For purpose of prediction, however, the test items must also reflect the critical performance requirements of the job environment. Basing the test content on the subject matter covered in the annex does not require explanation. Taking into account the performance requirements of the job situation with respect to these tasks, however, is a more difficult issue. It is not possible or necessarily desirable to exactly reproduce the job context in the training environment. Those aspects of the job which seem to present the greatest difficulties for the new AIT graduate deserve the most attention.

**TEST PLAN FOR THE PLL ANNEX
(Multiple Choice Items)**

| | | Request for issue NSN 1 | Turn-in 2 | Rep. PLL Exch. Maint. 3 | 4 | Supply Status 5 | Req. for Issue Non NSN 6 | Follow- ups 7 | General 8 |
|----------------------|---|-------------------------------|--------------|-------------------------------|---|-----------------------|--------------------------------|---------------------|--------------|
| Form Functions | A | | | | | | | | |
| Definitions | B | | | | | | | | |
| Form Fill Out | C | | | | | | | | |
| Form Related | D | | | | | | | | |
| Postings | E | | | | | | | | |
| System Procedures | F | | | | | | | | |

Figure 1

Test items for the PLL manual duty position should be developed for all applicable cells of the test plan. Each test should include an appropriate sample of items from this total pool, with the sample based on the weighting (if any) of the different functional areas. If all areas have the same weight, then approximately equal numbers of items of the test should come from each of the functional areas. If one area is given a weight of 1.5, then half again as many test items should come from that column.

When the test plan is integrated into a CMI system, the instructors will have the ability to make very fine grained evaluations of trainee comprehension and memory for the different duty position content areas. Since each test item is tied to a particular cell of the test matrix, summary tables can be created which describe the pattern of errors made by the trainee on the test. In other words, errors are summed along the rows and columns of the matrix, thus providing a clear measure of error clusters along any particular row or column. Such a cluster would indicate a major area of trainee weakness. For example, if a trainee had 7 errors on the PLL manual test and 4 of them were on items from Column 4, this would indicate trainee weakness in PLL maintenance procedures. Of course, the CMI system will be able to make such analyses for each of the trainees immediately available after all the test answers have been entered.

Item Construction

Once the test plan has been constructed and the item types and their relative weights specified, then item construction and validation can begin. Subject matter experts generate items whose characteristics meet those specified in the test plan. The number of items generated is roughly 3 to 4 times greater than the total number needed so that at least one alternate test form can be developed.

When enough items have been developed, they should be tried out on a pilot basis with personnel currently filling 76C duty positions and/or with trainees currently enrolled in the AIT course. Point biserial correlations or other appropriate statistical analyses should be performed on the overall test. The objective is to define the difficulty level (the number of test-takers correctly answering the item) and its discriminative power (the number of trainees scoring in the top 50% on the test who pass the item compared to the number of trainees scoring in the bottom 50% who pass the item). The test should have items ranging in difficulty (e.g., 10% to 90% passing rates) which best differentiate high and low performing trainees at each level of difficulty.

Unlike aptitude tests, an achievement test such as the end-of-annex test considered here cannot contain items solely on the basis of their psychometric properties since there are particular competencies which must be exhibited by all AIT trainees. However, it is highly useful to have a substantial proportion of test items on which a range of performance can be expected because it can then serve as a predictive instrument for success on the job and in further training.

Since the purpose of TTFA is to experimentally evaluate the effect of new methods and training technology on course and job performance, it is necessary to have a reliable criterion measure which can be used as a yardstick for such evaluations. The examinations currently being used in the classroom were not intended for this use and suffer from severe restriction of range effects which limit their use as criterion measures. The restriction in range of the scores occurs through the testing procedures currently used which permit test retakes.

After the pilot testing and psychometric validation of the test items have been completed and sets of items sufficient to form two alternate forms of the test specified in the test plan have been selected, the validation of the test as a predictor of performance should be conducted. The objective is to determine whether trainees who score well on the test will also perform well on the job or in situations which are highly similar to the assigned job.

There are a number of ways to establish the validity of a performance test. Trainees can be followed to the job and their performance correlated with their test scores. Alternatively, a group of current 76C personnel can take the test and their test scores would be correlated with their job proficiency. If validation has to be undertaken completely within the context of the training environment, then the trainee scores on the end-of-annex tests can be validated against trainee performance on the appropriate components of the end-of-course performance exercise. The end-of-course exercise involves performance in a simulated motor pool environment.

PLL and Shop Stock Validations

A preliminary item validation effort for PLL and Shop Stock end-of-annex tests composed of multiple choice items was conducted at Fort Lee, VA and Fort Lewis, WA. The multiple choice items were given to groups of 76C personnel who had to answer them under conditions similar to those in the 76C AIT, i.e., access to DA Pam 710-2-1 (supply update) was permitted but collaboration on answers was not.

The PLL Clerks and Shop Stock Clerks surveyed were able to complete the tests in a maximum of 60 minutes. The subjects were currently working in the appropriate duty position and had been assigned to that position not less than 6 months nor more than 4 years ago. No significant differences on test performance were found as a function of different biographical characteristics but the sample size (n=27 at Fort Lee, n=28 at Fort Lewis) was relatively small and may have obscured differences.

Biserial correlations (between item success and full test success) were computed for each of the test items on the two end-of-annex tests (cf. Appendix B.) On the PLL test, 23 of the 42 items had biserial correlations greater than the criterion of $r=.20$ for acceptable psychometric properties. On the Shop Stock test, 28 of the 47 items had biserial correlations greater than the criteria of $r=.20$. (For test security reasons the items cannot be listed here).

The remainder of the items fell into two categories: (1) items with very high pass rates and (2) items with low pass rates and equivalent performance between high and low scorers. Since the end-of-annex tests are achievement tests, certain knowledges must be demonstrated by all trainees. Thus, all items cannot be included solely on their capacity as differential predictors of performance. For this reason, 13 items with low biserial correlations due to high pass rates were included since they cover essential actions of the duty position. The items falling into the second category were basically items which for various reasons the test-takers found to be confusing, inaccurate, or not in total accordance with customary procedures. All of these (6) items were discarded as deficient.

This pilot testing permitted the development of final versions of the PLL (manual) and Shop Stock Clerk multiple choice tests to be used in TTFA evaluations and validations of new training methodologies. In addition, the tests are now ready for integration into a CMI system designed for 76C AIT course administration now being acquired for the TTFA.

REFERENCES

Duncan, D. MOS Baseline Skills Data Base Handbooks (RP 85-10) Alexandria, VA: US Army Research Institute, 1984

Hughes Aircraft Verification of 76C Training Problems. Report CRDL A024 Fort Lee, VA: Directorate of Training Developments, Quartermaster School, 1981.

Keesee, R. et al. Human Performance Review of the Retail Repair Parts Supply System (TM3-80) Aberdeen, MD: US Army Human Engineering Lab; 1980.

Training and Doctrine Command Army Occupational Survey Program (MOS 76C) Alexandria, VA: US Army Soldier Support Center, 1983.

APPENDIX A

BSEP Critical Tasks for 76C MOS

| <u>Task Number</u> | <u>Title</u> |
|--------------------|---|
| 1. | 76C 101-539-1101 Maintain a Prescribed Local List (Manual) |
| 2. | 76C 101-539-1102 Prepare and Maintain Non-stock List Records |
| 3. | 76C 101-539-1103 Process a Request for a Prescribed Load List Repair Part (Manual) |
| 4. | 76C 101-539-1104 Process a Request for a Prescribed Load List Repair Part (Automated) |
| 5. | 76C 101-539-1105 Process a Request for Non-stockage List Repair Part (Manual) |
| 6. | 76C 101-539-1106 Process a Request for Non-stockage List Repair Part (Automated) |
| 7. | 76C 101-539-1107 Process a Request for Non-national Stock Number Repair Part (Manual) |
| 8. | 76C 101-539-1108 Process a Request for Non-national Stock Number Repair Part (Automated) |
| 9. | 76C 101-539-1109 Process a Request for a Repair Part Designated as a Direct Exchange (Manual) |
| 10. | 76C 101-539-1110 Process a Request for a Repair Part Designated as a Quick Supply Store |
| 11. | 76C 101-539-1111 Receive Repair Parts (Manual) |
| 12. | 76C-101-539-1112 Receive Repair Parts (Automated) |
| 13. | 76C-101-539-1113 Turn-in Repair Parts (Manual) |
| 14. | 76C-101-539-1114 Turn-Repair Parts (Automated) |
| 15. | 76C-101-539-1115 Conduct Review and Inventory of Prescribed Load List (PLL) Records (Manual) |
| 16. | 76C-101-539-1116 Process Prescribed Load List (PLL) Change Listings (Automated) |
| 17. | 76C-101-539-1118 Process Supply and shipment Status List of Cards |
| 18. | 76C-101-539-1119 Initiate Follow-up or Document Modification Action |
| 19. | 76C-101-539-1120 Initiate Cancellation Action |
| 20. | 76C-101-539-1121 Perform Reconciliation of Due-in |
| 21. | 76C-101-539-1301 Prepare and Maintain an Equipment Log MOS: 17K 54E |
| 22. | 76C-101-539-1302 Prepare and Maintain a Preventive Maintenance Schedule and Record |
| 23. | 76C-101-539-1303 Prepare and Maintain an Equipment Uncorrected Fault Record |
| 24. | 76C-101-539-1304 Request Repair or Modification of Equipment MOS: 31M |
| 25. | 76C-101-539-1305 Prepare and Maintain an Equipment Component Register |
| 26. | 76C-101-539-1306 Prepare an Equipment Control Record MOS: 54E |
| 27. | 76C-101-539-1307 Dispatch and Record Return of Equipment MOS: 76C |

- 28. 76C-101-539-1308 Prepare and Maintain The Material Condition Status Report
- 29. 76C-101-539-1309 Prepare and Maintain the Oil Analysis
- 30. 76C-101-539-1401 Process Complete or Rejected Request for Maintenance
- 31. 76C-101-539-1402 Process Maintenance Work Request Envelope and Update Maintenance Workload Status
- 32. 76C-101-539-1403 Process Complete or Rejected Request for Maintenance
- 33. 76C-101-539-1404 Process an Intra-Shop Work Request
- 34. 76C-101-539-1405 Process a Work Request in Shop Supply

- 35. 76C-101-539-1406 Maintain a Shop Stock List
- 36. 76C-101-539-1407 Maintain a Bench Stock
- 37. 76C-101-539-1408 Prepare and Maintain a Parts Request/Status Register for a Request (Manual)
- 38. 76C-101-539-1409 Prepare and Maintain a Parts Request/Status Register for Status (Automated)
- 39. 76C-101-539-1410 Conduct Review of Shop Stock Records (Manual)

Appendix B

ITEM STATISTICS FOR THE SHOP STOCK CLERK TEST
(Multiple Choice)

| | ITEM 1 | ITEM 2 | ITEM 3 | ITEM 4 | ITEM 5 | ITEM 6 | ITEM 7 | ITEM 8 | ITEM 9 | ITEM 10 | ITEM 11 |
|-------|------------------------------|----------------------------|----------------------------|------------------------------|------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| SCORE | -0.0273 (27) p = .893 | .0930 (27) p = .641 | .1343 (27) p = .504 | -0.1005 (27) p = .618 | -0.1005 (27) p = .618 | .5225 (27) p = .005 | .1396 (27) p = .487 | .4229 (27) p = .028 | .0692 (27) p = .731 | .2001 (27) p = .317 | .0846 (27) p = .675 |

(COEFFICIENT / (CASES) / 2-TAILED SIG) " . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

| | ITEM 12 | ITEM 13 | ITEM 14 | ITEM 15 | ITEM 16 | ITEM 17 | ITEM 18 | ITEM 19 | ITEM 20 | ITEM 21 | ITEM 22 |
|-------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|------------------|------------------------------|------------------|------------------------------|----------------------------|----------------------------|
| SCORE | .3953 (27) p = .041 | .1155 (27) p = .566 | .2573 (27) p = .195 | .3299 (27) p = .093 | .3183 (27) p = .106 | . (27) p = . | -0.0288 (27) p = .886 | . (27) p = . | -0.0273 (27) p = .893 | .1288 (27) p = .522 | .4949 (27) p = .009 |

(COEFFICIENT / (CASES) / 2-TAILED SIG) " . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Point biserial correlations calculated for each of the test items in the shop stock multiple choice test are presented as SCORE. The number of subjects responding to the item is listed in parentheses. P = proportion of correct responses. When P = 1.00 or 0, a biserial correlation cannot be computed.

SHOP STOCK CLERK MULTIPLE CHOICE (CONT.)

| | ITEM 23 | ITEM 24 | ITEM 25 | ITEM 26 | ITEM 27 | ITEM 28 | ITEM 29 | ITEM 30 | ITEM 31 | ITEM 32 | ITEM 33 |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| SCORE | .2397 | .5130 | .4301 | .1913 | .2598 | .5660 | .4301 | .4301 | .2480 | .2532 | .5539 |
| | (.27) | (.27) | (.27) | (.27) | (.27) | (.27) | (.27) | (.27) | (.27) | (.27) | (.27) |
| | p=.228 | p=.006 | p=.025 | p=.339 | p=.191 | p=.002 | p=.025 | p=.025 | p=.212 | p=.203 | p=.003 |

(COEFFICIENT / (CASES) / 2-TAILED SIG) " . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

| | ITEM 34 | ITEM 35 | ITEM 36 | ITEM 37 | ITEM 38 | ITEM 39 | ITEM 40 | ITEM 41 | ITEM 42 | ITEM 43 | ITEM 44 |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| SCORE | .3672 | .6057 | . | .3876 | 3474 | .2165 | .5185 | .0863 | .4358 | .5429 | .0898 |
| | (.27) | (.27) | (.27) | (.27) | (.27) | (.27) | (.27) | (.27) | (.27) | (.27) | (.27) |
| | p=.060 | p=.001 | p=. | p=.046 | p=.076 | p=.278 | p=.006 | p=.669 | p=.023 | p=.003 | p=.656 |

(COEFFICIENT / (CASES) / 2-TAILED SIG) " . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

SHOP STOCK CLERK MULTIPLE CHOICE (Cont.)

| | ITEM 45 | ITEM 46 | ITEM 47 |
|-------|---------|---------|---------|
| SCORE | -0.0063 | -0.1522 | .3266 |
| | (27) | (27) | (27) |
| | p= .975 | p= .448 | p= .096 |

(COEFFICIENT / (CASES) / 2-TAILED SIG) " . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

ITEM STATISTICS FOR THE PLL CLERK TEST
(Multiple Choice)

| | ITEM 1 | ITEM 2 | ITEM 3 | ITEM 4 | ITEM 5 | ITEM 6 | ITEM 7 | ITEM 8 | ITEM 9 | ITEM 10 | ITEM 11 |
|-------|------------------|----------------|----------------|------------------|------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| SCORE | -0.0273 (27) | .0930 (27) | .1343 (27) | -0.1005 (27) | -0.1005 (27) | .5225 (27) | .1396 (27) | .4229 (27) | .0692 (27) | .2001 (27) | .0846 (27) |
| | p=.893 | p=.641 | p=.504 | p=.618 | p=.618 | p=.005 | p=.487 | p=.028 | p=.731 | p=.317 | p=.675 |

(COEFFICIENT / (CASES) / 2-TAILED SIG) " . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

| | ITEM 12 | ITEM 13 | ITEM 14 | ITEM 15 | ITEM 16 | ITEM 17 | ITEM 18 | ITEM 19 | ITEM 20 | ITEM 21 | ITEM 22 |
|-------|----------------|----------------|----------------|----------------|----------------|--------------|------------------|--------------|------------------|----------------|----------------|
| SCORE | .3953 (27) | .1155 (27) | .2573 (27) | .3299 (27) | .3183 (27) | . . (27) | -0.0288 (27) | . . (27) | -0.0273 (27) | .1288 (27) | .4949 (27) |
| | p=.041 | p=.566 | p=.195 | p=.093 | p=.106 | p=. | p=.886 | p=. | p=.893 | p=.522 | p=.009 |

(COEFFICIENT / (CASES) / 2-TAILED SIG) " . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Point biserial correlations calculated for each of the test items in the PLL multiple choice test are presented as score.
The number of subjects responding to the item is listed in parentheses. P = proportion of correct responses.
When p = 1.00 or 0 a biserial correlation cannot be computed.

PREScribed LOAD LIST (FLL) (Cont.)

| ITEM 23 | ITEM 24 | ITEM 25 | ITEM 26 | ITEM 27 | ITEM 28 | ITEM 29 | ITEM 30 | ITEM 31 | ITEM 32 | ITEM 33 |
|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|-----------------------------|---------|
| .1609 (.28) p=.413 | .2283 (.28) p=.243 | .3596 (.28) p=.060 | .1115 (.28) p=.572 | .2311 (.28) p=.237 | .2636 (.28) p=.175 | .0483 (.28) p=.807 | .2310 (.28) p=.237 | .3468 (.28) p=.071 | -0.0243 (.28) p=.902 | |

(COEFFICIENT / (CASES) / 2-TAILED SIG) " . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

| ITEM 34 | ITEM 35 | ITEM 36 | ITEM 37 | ITEM 38 | ITEM 39 | ITEM 40 | ITEM 41 | ITEM 42 |
|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| .2562 (.28) p=.188 | .5306 (.28) p=.004 | .2839 (.28) p=.143 | .1652 (.28) p=.401 | .1543 (.28) p=.433 | .0676 (.28) p=.732 | .2644 (.28) p=.174 | .2928 (.28) p=.130 | .3883 (.28) p=.041 |

(COEFFICIENT / (CASES) / 2-TAILED SIG) " . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED