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Development and Preliminary Validation of the Electronic Data Processing Test-63

By
William B. Lecznar
John K. Klesch, 2d Lt USAF

PERSONNEL RESEARCH LABORATORY
AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
Lackland Air Force Base, Texas

FOREWORD

As part of Project 7717, Selection, Classification, and Evaluation Procedures for Air Force Personnel; Task 771705, Selection and Classification Instruments for Airman Personnel Programs, the Electronic Data Processing Test (EDPT) Form 63 was assembled and standardized by Dr. Ralph S. Kaplan. Dr. Kaplan left the staff of the Personnel Research Laboratory prior to report preparation and preliminary validation of the instrument.

The cooperation extended by the Sheppard Technical Training Center was a necessary part of the validation phase. The assistance provided by TSgt Homer Ray of the Sheppard AFB Test Control Office in administering EDPT to students entering 685XX and 687XX training and by Mr. C.E. White of the Measurement Section, Sheppard Technical Training Center, in obtaining criterion data for the validation is most appreciated. The project could not have been completed without their participation.

This technical report has been reviewed and is approved.

John Patterson, Col USAF
Commander

Edward H. Kemp
Technical Director

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ABSTRACT

As a result of increasing automation of Air Force records, it is necessary to identify airmen who can be trained to handle new electronic data processing equipment. The Electronic Data Processing Test–63 (EDPT-63) was developed to meet this need. The test is composed of 4 subtests: Arithmetic Reasoning, Figure Analogies, Number Series, and Verbal Analogies. This report covers the development and initial validation of EDPT-63 for technical courses 685X0 and 687X0. The test's effectiveness was compared to other possible predictors such as the aptitude indexes of the Airman Qualifying Examination, education, and the Armed Forces Qualification Test (AFQT). EDPT-63 was found to have substantial validity for all of the samples available. In many instances, it was the best single predictor and when its 4 subtests were optimally weighted, they yielded a substantially higher multiple correlation than all other predictors combined. The next most effective predictor was the General Aptitude Index of the Airman Qualifying Examination.

TABLE OF CONTENTS

LIST OF TABLES

DEVELOPMENT AND PRELIMINARY VALIDATION OF THE ELECTRONIC DATA PROCESSING TEST-63

I. INTRODUCTION

As the electronic computer and its applications broadened in scope, the Air Force naturally became one of the prime users of such equipment. An early use was, of course, in programming the trajectory of our ballistic missiles. The data processing field, however, was expanding in its automation. The Air Force had no formal training course in-house and Air Force personnel obtained their training through the customer service departments of electronic data processing equipment manufacturers. Selection for such training sometimes involved a particular test used by the manufacturer, but no common instrument or qualifying score was available Air Force wide.

In late 1961, the Strategic Air Command indicated its desire for a test in Air Force inventory that could be used for selecting Air Force personnel for computer programmer training. This need led to a requirement for development and standardization of the Electronic Data Processing Test – 63 (EDPT-63). By mid-1964, the Air Force established a formal course of training in this field and data were obtained for an early validation of the test. This report describes the EDPT and presents some early results of its use in the Air Force.

II. TEST DEVELOPMENT AND STANDARDIZATION

Because there were no Air Force technical training courses in operational at the time of EDPT development, the first form of the test was patterned after, and normed to, the IBM Programmer Aptitude Test (IBM PAT).

Items were selected from inventory for the subtests designated as Arithmetic Reasoning, Figure Analogies, and Verbal Analogies; items for the Number Series section were constructed specifically for the EDPT. In a trial administration of these 120 items, 30 per subtest, the Figure Analogies were patently too difficult for the intended population. Statistics for the items selected had been based originally on a group of college sophomores. A new set of Figure Analogies items was selected and the EDPT was recast and administered for norming purposes. As compared with IBM PAT, the EDPT differed in two basic ways:

1. it contained verbal analogies items;
2. it was in spiral omnibus form administered as a power test rather than in separately timed discrete subtests.

For the standardization, Air Force enlistees in basic military training were used as the base sample. The nature of the programmer task and the selection criteria used for entry to customer training programs indicated that only enlistees in Armed Forces Qualification Test Categories I and II (percentiles 65-100) would be appropriate. Testing was done in June 1962 by giving the IBM PAT (according to the manual for its administration) in counterbalanced order with EDPT as a 90-minute power test to approximately 1,150 airmen. After processing there were 1,144 complete data cases. Comparison of the two groups determined by the order of test administration indicated they could be combined for further work (see Appendix).

For lack of Air Force training course data, qualifying scores on EDPT were set equivalent to the B and C level cutoffs on the IBM PAT by determining the cumulative percentage of airmen scoring 50 (the B level) and above on IBM PAT and locating the EDPT raw score which had an equivalent cumulative percentage of cases at that score. The C level was similarly determined. A table of equivalents is in the Appendix (Table 4). The B cutoff was to be applied for selection to the programmer area, AFSC 687XX, and the C level for the EDP equipment operator field, AFSC 685XX. In the standardization sample, the correlation between the IBM and Air Force programmer tests was .73; the distribution of scores on the two tests verified the notion that only AFQT Category I and II airmen had sufficient ability to handle the test content.

III. PRELIMINARY VALIDATION

Prior to actual field use of the test for selection, it was possible to give it to enlisted personnel entering the ABR 68530A course, Data Processing Machine Operator, but the ABR 68730 course, Programming Specialist, was not established until after EDPT-63 was announced for operational use in January 1964. Therefore the data which follow involve unselected samples on EDPT for the 685XX field, but samples screened on EDPT for the 687XX training.

During the period in 1963 in which EDPT was administered, the 685XX course went through a content revision. The earlier course was covered by five blocks of training and the later version by four blocks; the first three blocks were common to both versions.

Block	Old Course Title	New Course Title
I	Basic Operation & Wiring of Data Processing Machine	Same
II	Collator – 089	Same
III	Accounting Machine – 407	Same
IV	Reproducing Punch – 514	Electronic Data Processing Machine
V	Calculating Punch – 602	

A second complicating feature in the validation was lack of data on some cases; that is, some cases did not have the Airman Qualifying Examination (AQE) aptitude indexes (AIs) and some cases lacked EDPT. This led to validation for several separate samples identified and defined as follows:

Sample 1 – Course 685XX – Old with EDPT and AIs, N = 65
Sample 2 – Course 685XX – New with EDPT and AIs, N = 60
Sample 3 – Course 685XX – Old with EDPT only, N = 65
Sample 4 – Course 685XX – New with EDPT only, N = 66
Sample 5 – Course 685XX – Old with AIs only, N = 66
Sample 6 – Course 685XX – New with AIs only, N = 355
Sample 7 – Course 687XX – Data provided by Air Training Command, N = 98
Sample 8 – Course 687XX – Graduates matched to EDPT answer sheets, N = 143

Nearly all of the cases in Sample 7 are a part of Sample 8, but Sample 7 data were provided in a form which did not permit identification of individuals.

The validation process first involved scoring the EDPT by its individual item types; this made available four subtest raw scores plus a total raw score for Samples 1 through 4 and 8. Aptitude indexes were recorded where available. Block grades and final school grade in the course of training were also recorded; these variables were the criteria to be predicted. Intercorrelational and multiple regression analyses were run on Samples 1, 2, 3, 4, and 8 with means and standard deviations reported; only intercorrelations were obtained for Samples 5 and 6.

IV. RESULTS AND CONCLUSIONS

A summary of the EDPT and AI validities by sample are shown in Table 1; more complete data are given in the Appendix. EDPT has substantial correlations for both the 685X0 and 687X0 courses. Notice also that it compares favorably to the AIs as a predictor. Furthermore, Table 6 shows that EDPT is consistently the best composite predictor, compared with AIs, for

Table 1. **Validities of Electronic Data Processing Test-63 and Airman Qualifying Examination Aptitude Indexes for Courses ABR685X0 and 687X0**

Sample	N	EDPT	Mech	Admin	Gen	Elec
1 685X0	65	.66	.32	.21	.51	.39
2 685X0	60	.31	.32	.14	.30	.30
3 685X0	65	.55	--	--	--	--
4 685X0	66	.45	--	--	--	--
5 685X0	66	--	.08	.03	.11	.08
6 685X0	355	--	.33	.10	.30	.39
7 687X0	98	.44[a]	--	--	--	--
8 687X0	143	.36[a]	.25	.09	.11	.24

[a] Not corrected for restriction resulting from selection to training using minimum EDPT score. Corrected values are .60 and .50, respectively, using SD from EDPT standardization sample as the unrestricted group. SD for AIs in the standardization sample are not available so that corrected validity of EDPT in Sample 8 cannot be compared directly with AI validities which are uncorrected.

each of the block grades in the two technical courses. It should be noted, however, that in Tables 6 (Block grades) and 8-14 (Intercorrelations) the Arithmetic Reasoning subtest of EDPT often has a higher validity than EDPT total score. This is an indication that improvement in EDPT effectiveness might be accomplished by reweighting the subtests, since they now are equally weighted.

From Table 1 it can also be seen that the General AI has substantial validities compared to the other AIs and this point is reinforced when validities for block grades are seen in Table 6. From the intercorrelations in Tables 8-14, the General AI is seen to correlate as high as .53 with EDPT. This value suggests the General AI might be used as an initial screening device for airmen who are to take the EDPT.

Comparisons of regression equations based on optimal weighting of all predictors *versus* equations derived from selected subsets of predictors are reported in Table 2 and in Table 7. These results are expressed in terms of differences in squared multiple correlations (R^2).

Table 2. **Comparison of Efficiency of Total Score and Optimally Weighted Subtests of the Electronic Data Processing Test-63**

Sample	Model	Predictors	R	R^2	F[a]	Significance Level
1	Full	EDPT Total + 4 Subtests	.72	.52	--	--
	Subset	EDPT Total	.66	.44	3.3	.05
2	Full	EDPT Total + 4 Subtests	.37	.14	--	--
	Subset	EDPT Total	.31	.10	.81	NS
3	Full	EDPT Total + 4 Subtests	.62	.39	--	--
	Subset	EDPT Total	.55	.30	3.00	.05
4	Full	EDPT Total + 4 Subtests	.53	.28	--	--
	Subset	EDPT Total	.45	.20	2.21	NS
8	Full	EDPT Total + 4 Subtests	.49	.24	--	--
	Subset	EDPT Total	.36	.13	6.1	.01

[a] F test computed as described by: Bottenberg, R. A. & Ward, J. H. Jr. *Applied multiple linear regression.* PRL-TDR-63-6, AD-413 128. Lackland AFB, Tex.: Personnel Research Laboratory, Aerospace Medical Division, March 1963.

The first series of multiple regression problems was done to see if any predictive efficiency could be gained by reweighting[1] the subtests of EDPT. Table 2 shows that some significant differences were obtained between the R^2s of EDPT total score alone *versus* optimal weighting of its subtests in both the 685X0 samples (.05 level) and 687X0 sample (.01 level). Cross validations have not been carried out thus far and shrinkage in the R^2s can be expected to occur. Since the amount of shrinkage will depend on how seriously the sample fluctuations affected the correlations of the predictors, no definite conclusions as to the validity of the findings can be made. Table 15 contains the summary statistics for the samples which show (along with the validities in Table 1) that the samples were fairly stable. The consistency of the efficiency gained, even though not significant in two of the samples, favors reweighting of the EDPT subtests.

The second series of multiple regression problems was done for three reasons: (1) to test the usefulness of EDPT; (2) to see if adding other predictors would improve the efficiency of EDPT; and (3) to further test the usefulness of reweighting the four subtests.

To test the usefulness of EDPT as it is now used, various other predictors were combined with EDPT total (full model) and without it (restricted model). This was done only in Sample 8 where, in addition to the AQE aptitude indexes and education, AFQT (highly loaded on Arithmetic Reasoning) was available. Table 7 shows that when EDPT is dropped from a combination of it with AIs, AFQT, and education the R^2 differs by .06; this difference is significant beyond the .01 level. Thus EDPT is shown as a very effective single predictor. When in the above regression problem, the restricted model is EDPT total, a difference significant at the .05 level is found between the R^2s. This means that by adding the weighted scores of these other predictors, it is possible to improve predictive efficiency of EDPT.

[1] Currently each test receives a weight of 1.

Also in Sample 1 when the General AI is added to EDPT the combination is seen to be significantly better than EDPT alone.

While the above results show that some improvement can be made by adding various predictors, notice in samples 2 and 8 that the addition of General AI to EDPT did not increase the prediction of final grades. All of the samples in Table 7 show that when the subtests of EDPT are reweighted, the R^2s are so improved that adding all other possible predictors does not result in significantly greater R^2s. Thus from a predictive efficiency point of view, the best procedure available is to reweight the subtests. Also when consideration is given as to how to make any changes in the present system, reweighting of the subtests is more practical. To add other predictors to EDPT total would involve supplying all the various scores of the predictors and their respective weights to the field processors, who would become overburdened with unnecessary paper work. On the other hand, reweighting the subtests would involve only applying the equations as given below. Using integral weights and dropping the constant, the equations would be as follows:

For 685X0

$$\text{EDPT total} = \text{AR}(5) + \text{FA}(3) + \text{NS}(1) + \text{VA}(1)$$

For 687X0

$$\text{EDPT total} = \text{AR}(5) + \text{FA}(1) + \text{NS}(1) + \text{VA}(2)$$

The similarity of the two equations suggests use of the equation for the 687X0 course for both courses to simplify field processing of EDPT. Any loss in validity of EDPT for the 685X0 course would be negligible in terms of the saving from decreased scoring time required. If such weights hold up under cross validation, they can be built into subsequent versions of EDPT by either adding or subtracting items for each of the subtests, as appropriate, in order to achieve the desired ratio of subtest standard deviations. Then the field processor would only have to score the test as a unit. An alternative would be to score by subtest, multiply each score by its appropriate integral weight, and add to obtain a total score. Since Arithmetic Reasoning items take so much testing time per unit, this might be the preferred choice.

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APPENDIX. INTERCORRELATIONS AND DESCRIPTIVE STATISTICAL DATA

Table 3. **Descriptive Statistics for Standardization Samples by Order of Test Administration**

	IBM PAT		EDPT	
	M	SD	M	SD
PAT First (N = 572)	34.85	12.59	53.89	14.12
EDPT First (N = 572)	35.38	12.23	51.52	14.88
Total Group (N = 1144)	35.09	12.51	52.75	14.74

Table 4. **Equivalence of IBM Programmer Aptitude Test Scores and Electronic Data Processing Test-63 Scores**

(N = 1,144 basic airmen, Category I and II)

IBM PAT Score[a]	Cumulative N	EDPT Cumulative %	EDPT Equivalent
80	1	.09	105
72	3	.26	103
69	7	.61	97
68	8	.61	96
67	9	.87	95
66	11	1.14	94
65	16	1.31	92
64	18	1.57	91
63	20	2.01	90
62	27	2.19	88
61	31	2.88	86
60	34	3.15	85
59	41	3.50	84
58	43	3.85	83
57	51	4.63	81
56	56	5.16	80
55	67	5.77	78
54	77	6.21	77
53	86	7.26	76
52	98	8.65	74
51	107	9.35	73
50	126	11 28	71
49	144	12.41	70
48	166	15.30	68
47	190	16.52	67
46	213	19.06	65
45	247	22.20	63
44	280	24.39	62
43	310	26.31	61
42	343	30.77	59
41	383	32.69	58
40	419	35.40	57
39	455	38.64	56
38	501	44.49	54
37	535	47.03	53
36	572	49.74	52
35	600	52.45	51
34	635	55.24	50
33	667	58.30	49
32	701	60.49	48
31	736	63.81	47
30	765	65.91	46

[a]IBM PAT scores are grouped into A (60 and above), B (50-59), C (40-49), and D (39 and below) levels.

Table 5. **Bivariate Distribution for IBM Programmer Aptitude Test and Electronic Data Processing Test-63**

(N = 1,144 NPS Male Basic Airmen, AFQT Category I and II)

	IBM PAT																					
EDPT	0-3	4-7	8-11	12-15	16-19	20-23	24-27	28-31	32-35	36-39	40-43	44-47	48-51	52-55	56-59	60-63	64-67	68-71	72-75	76-79	80-83	Total
103-109																1	1				1	3
96-102																	2	1	1			4
89-95											1		1	2	2	5	4	2				17
82-88										1	1	2	4	6	3	4	1	1	1			24
75-81								1		1	2	15	7	7	7	1		1				42
68-74							1	1	1	9	16	25	11	11	5	3						83
61-67			1				3	5	13	19	28	22	20	10	3	2	2					128
54-60			1	2	5	9	15	27	29	36	43	24	12	3	2							208
47-53			1		7	10	26	32	34	56	24	16	11	2								219
40-46	5	4	2	7	17	23	29	35	35	23	20	9	2	1								212
33-39	1	1	5	14	19	23	33	21	14	7	3	1										142
26-32		5	1	4	5	10	12	4	3	1												45
19-25	1	2	3	1	1	1		3														12
12-18		2		1	1																	4
5-11							1															1
Total	7	14	14	29	55	76	120	129	129	153	138	114	68	42	22	16	10	5	2	0	1	1144

IBM PAT Mean = 35.09 SD = 12.51 EDPT Mean = 52.75 SD = 14.74 r = .728

Table 6. **Validities of Various Predictors for Block Grades**[a]

Sample	Block	Description	Predictors[b]									
			EDPT	AR	FA	NS	VA	M	A	G	E	Educ
1	1	Operation & Wiring	22	35	16	16	01	05	26	33	09	15
	2	Collator 089	38	33	34	27	23	38	19	37	31	07
	3	Accounting Machine	59	56	55	47	23	32	17	45	44	-13
	4	Reproducing Punch	59	64	40	48	30	17	14	39	23	13
	5	Calculating Punch	62	57	59	40	36	21	-03	31	39	01
2	1	Operation & Wiring	08	08	11	07	-03	16	11	18	19	16
	2	Collator 089	36	33	28	27	22	25	05	13	24	08
	3	Accounting Machine	32	31	25	17	29	28	12	29	26	16
	4	Electronic Data Processing Machine	29	36	18	19	18	27	18	33	23	-03
3	1	Operation & Wiring	35	34	31	23	28	--	--	--	--	18
	2	Collator	39	38	44	16	30	--	--	--	--	07
	3	Accounting Machine	59	60	51	42	42	--	--	--	--	09
	4	Reproducing Punch	45	47	50	19	32	--	--	--	--	13
	5	Calculating Punch	42	46	35	27	29	—	--	--	--	12
4	1	Operation & Wiring	21	25	24	14	05	--	--	--	--	-04
	2	Collator	32	39	23	22	22	--	--	--	--	-03
	3	Accounting Machine	51	52	45	34	33	--	--	--	--	13
	4	Electronic Data Processing Machine	41	45	33	35	20	--	--	--	--	-01
5	1	Operation & Wiring	--	--	--	--	--	-20	-07	-08	-19	04
	2	Collator	--	--	--	--	--	06	-03	03	06	04
	3	Accounting Machine	--	--	--	--	--	18	05	10	15	-07
	4	Reproducing Punch	--	--	--	--	--	08	03	11	08	03
	5	Calculating Punch	--	--	--	--	--	00	-01	10	02	10
6	1	Operation & Wiring	--	--	--	--	--	25	03	17	27	18
	2	Collator	--	--	--	--	--	15	09	18	23	12
	3	Accounting Machine	--	--	--	--	--	35	08	28	38	12
	4	Electronic Data Processing Machine	--	—	--	--	--	31	14	31	35	22
8	1	Intro to Data Process.	32	42	10	-02	26	23	12	18	21	28
	2	Basic Programming	40	46	14	07	28	25	07	12	25	26
	3	Input/Output Routines	28	37	09	01	19	20	11	11	17	27
	4	Program Language	18	21	09	09	06	06	-02	-07	12	02

[a] Decimal points omitted.

[b] Identification of predictors listed above.

EDPT - Total score
AR - Arithmetic Reasoning subtest
FA - Figure Analogies subtest
NS - Number Series subtest
VA - Verbal Analogies subtest
M - Mechanical AI
A - Administrative AI
G - General AI
E - Electronics AI
Educ - Education in years

Table 7. **Comparisons of Efficiency of Various Combinations of Predictors**

Sample	Model	Predictors[a]	R	R^2	F[b]	Significance Level
1	Full	EDPT Total + 4 Subtests + Education + 4 AIs	.76	.58	--	--
	Subset	4 Subtests of EDPT	.72	.52	1.60	NS
	Full	4 Subtests + 4 AIs	.75	.57	--	--
	Subset	4 AIs	.56	.31	8.43	.01
	Full	EDPT Total + General AI	.69	.48	--	--
	Subset	EDPT Total	.66	.44	4.76	.05
2	Full	EDPT Total + 4 Subtests + Education + 4 AIs	.45	.20	--	--
	Subset	4 Subtests of EDPT	.37	.14	.76	NS
	Full	4 Subtests + 4 AIs	.44	.19	--	--
	Subset	4 AIs	.36	.13	.95	NS
	Full	EDPT Total + General AI	.35	.12	--	--
	Subset	EDPT Total	.31	.10	1.30	NS
3	Full	EDPT Total + 4 Subtests + Education	.62	.39	--	--
	Subset	4 Subtests of EDPT	.62	.39	0	NS
4	Full	EDPT Total + 4 Subtests + Education	.56	.31	--	--
	Subset	4 Subtests of EDPT	.53	.28	2.65	NS
8	Full	EDPT Total + 4 Subtests + Education + 4 AIs + AFQT	.54	.29	--	--
	Subset	4 Subtests of EDPT	.49	.24	1.57	NS
	Full	4 Subtests + 4 AIs	.51	.26	--	--
	Subset	4 AIs	.28	.08	8.18	.01
	Full	EDPT Total + 4 AIs + Education + AFQT	.48	.23	--	--
	Subset	4 AIs + Education + AFQT	.41	.17	10.00	.01
	Full	EDPT Total + 4 AIs + Education + AFQT	.48	.23	--	--
	Subset	EDPT Total	.36	.13	2.91	.05
	Full	EDPT Total + General	.36	.13	--	--
	Subset	EDPT Total	.36	.13	0	NS

[a] Only samples 1, 2, and 8 have the AIs considered in the regression problems and only sample 8 has AFQT scores considered. The variable "Education" was years of formal education completed.

[b] F test computed as described by Bottenberg & Ward (1963, Ch. 2).

Table 8. **Intercorrelations of Predictor and Criterion Variables for Sample 1**

(N = 65)

Variable	1	2	3	4	5	6	7	8	9	10	11
1 EDPT Total		80	85	77	70	27	23	49	29	-07	66
2 Arith Reas			54	58	36	20	18	47	22	-01	68
3 Fig Anal				48	60	22	11	38	44	-11	55
4 No Series					29	25	27	48	20	-02	49
5 Verbal Anal						18	17	19	00	-08	32
6 Mech AI							13	49	26	-17	32
7 Adm AI								51	09	10	21
8 Gen AI									37	07	51
9 Elec AI										-07	39
10 Education											07
11 Final Grade											

Note. – Decimal points are omitted.

Table 9. **Intercorrelations of Predictor and Criterion Variables for Sample 2**

(N = 60)

Variable	1	2	3	4	5	6	7	8	9	10	11
1 EDPT Total		73	79	82	77	40	41	53	54	14	31
2 Arith Reas			34	46	55	25	35	53	51	09	35
3 Fig Anal				55	49	45	30	36	43	04	24
4 No Series					46	27	27	41	34	07	20
5 Verbal Anal						26	40	38	42	28	19
6 Mech AI							33	56	71	-03	32
7 Adm AI								69	58	-09	14
8 Gen AI									76	06	30
9 Elec AI										16	30
10 Education											10
11 Final Grade											

Note. – Decimal points are omitted.

Table 10. **Intercorrelations of Predictor and Criterion Variables for Semple 3**

(N = 65)

Variable	1	2	3	4	5	6	7
1 EDPT Total		85	84	82	81	24	55
2 Arith Reas			65	57	58	27	57
3 Fig Anal				56	57	16	54
4 No Series					58	23	31
5 Verbal Anal						12	41
6 Education							14
7 Final Grade							

Note. – Decimal points are omitted.

Table 11. **Intercorrelations of Predictor and Criterion Variables for Sample 4**

(N = 66)

Variable	1	2	3	4	5	6	7
1 EDPT Total		77	86	78	82	33	45
2 Arith Reas			54	45	51	33	50
3 Fig Anal				55	63	25	38
4 No Series					50	21	32
5 Verbal Anal						29	24
6 Education							02
7 Final Grade							

Note. – Decimal points are omitted.

Table 12. **Intercorrelations of Predictor and Criterion Variables for Sample 5**

(N = 66)

Variable	1	2	3	4	5	6
1 Mech AI		36	59	81	-30	08
2 Adm AI			79	64	04	03
3 Gen AI				78	-03	11
4 Elec AI					-27	08
5 Education						03
6 Final Grade						

Note.–Decimal points are omitted.

Table 13. **Intercorrelations of Predictor and Criterion Variables for Sample 6**

(N = 355)

Variable	1	2	3	4	5	6
1 Mech AI		17	56	66	04	33
2 Adm AI			48	37	-16	10
3 Gen AI				57	-01	30
4 Elec AI					01	39
5 Education						20
6 Final Grade						

Note. – Decimal points are omitted.

Table 14. **Intercorrelations of Predictor and Criterion Variables for Sample 8**

(N = 143)

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1 EDPT Total		78	60	56	57	32	19	33	21	33	26	36
2 Arith Reas			32	26	29	36	29	37	22	29	22	46
3 Fig Anal				15	18	29	15	36	12	30	27	13
4 No Series					-04	-06	-14	-13	08	00	-07	03
5 Verbal Anal						21	17	26	09	27	26	25
6 AFQT							11	57	01	16	30	30
7 Education								18	08	17	18	28
8 Mech AI									14	44	53	25
9 Adm AI										59	25	09
10 Gen AI											40	11
11 Elec AI												24
12 Final Grade												

Note. – Decimal points are omitted.

Table 15. **Summary Statistics for Test Variables and School Grade for All Samples**

Variable	Sample 1 N = 65		Sample 2 N = 60		Sample 3 N = 65		Sample 4 N = 66		Sample 5 N = 66		Sample 6 N = 355		Sample 7 N = 98		Sample 8 N = 143	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
EDPT Total	47.40	15.77	44.93	14.00	49.08	16.06	45.38	15.72	--	--	--	--	83.43	9.70	84.48	10.12
Arith Reas	8.29	4.81	7.97	4.26	8.66	5.09	7.39	4.40	--	--	--	--	--	--	18.69	4.66
Fig Anal	15.03	5.57	13.53	5.08	15.49	4.86	14.06	5.36	--	--	--	--	--	--	24.85	3.22
No Series	14.09	5.34	14.30	5.04	15.20	4.92	13.83	4.97	--	--	--	--	--	--	22.41	4.12
Verbal Anal	9.98	4.44	9.13	3.60	9.72	4.46	10.09	4.77	--	--	--	--	--	--	18.54	3.96
Mech AI	48.08	20.68	52.58	22.22	--	--	--	--	56.67	22.48	63.00	21.54	--	--	85.10	13.36
Adm AI	63.54	17.67	60.93	16.77	--	--	--	--	74.02	21.52	88.21	8.45	--	--	89.65	7.40
Gen AI	60.62	17.99	61.42	18.26	--	--	--	--	69.17	19.04	81.77	11.33	--	--	92.17	5.90
Elec AI	51.85	21.37	57.75	18.24	--	--	--	--	61.89	21.19	70.55	18.33	--	--	89.34	11.38
Education	12.06	0.55	12.07	0.31	12.25	0.63	12.11	0.65	12.14	0.87	11.97	1.05	--	--	13.08	1.11
AFQT	--	--	--	--	--	--	--	--	--	--	--	--	--	--	90.27	8.56
Final Tech School Grade	86.46	3.43	85.62	2.95	86.82	3.73	86.18	3.59	85.89	3.09	85.50	3.29	86.07	2.96	85.60	3.16

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13. ABSTRACT

As a result of increasing automation of Air Force records, it is necessary to identify airmen who can be trained to handle new electronic data processing equipment. The Electronic Data Processing Test-63 (EDPT-63) was developed to meet this need. The test is composed of 4 subtests: Arithmetic Reasoning, Figure Analogies, Number Series, and Verbal Analogies. This report covers the development and initial validation of EDPT-63 for technical courses 685X0 and 687X0. The test's effectiveness was compared to other possible predictors such as the aptitude indexes of the Airman Qualifying Examination, education, and the Armed Forces Qualification Test (AFQT). EDPT-63 was found to have substantial validity for all of the samples available. In many instances, it was the best single predictor and when its 4 subtests were optimally weighted, they yielded a substantially higher multiple correlation than all other predictors combined. The next most effective predictor was the General Aptitude Index of the Airman Qualifying Examination.

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Programmer Aptitude Test (PAT)						
computer						
arithmetic reasoning tests						
figure analogies tests						
verbal analogies tests						
number series tests						
programming (computers)						
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