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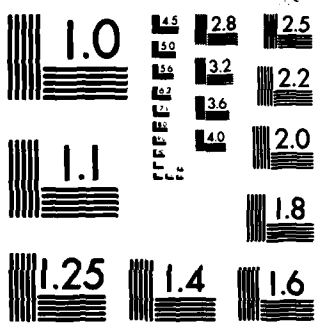

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AIR FORCE HUMAN RESOURCES LABORATORY

ENGLISH DIAGNOSTIC TEST: VALIDATION FOR JOURNALISM-RELATED PROGRAMS

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This paper presents the results of an investigation into the predictive validities of the English Diagnostic Test (EDT). Data on the EDT were based on 228 enlisted service personnel enrolled in journalism-related programs. Multiple regression analyses were conducted for the Armed Services Vocational Aptitude Battery (ASVAB) composite test scores and the EDT raw scores, using final school grades as the dependent variable. The analyses show that the Air Force General test composite (GEN) (Arithmetic Reasoning, Word Knowledge, and Paragraph Comprehension) has higher predictive validity than the EDT or other service composite. A GEN cutoff score of the 65th percentile was recommended. Keywords

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ENGLISH DIAGNOSTIC TEST: VALIDATION FOR JOURNALISM-RELATED PROGRAMS

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This publication is primarily a working paper.
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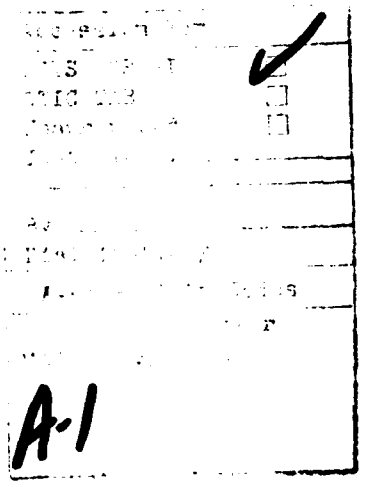
SUMMARY

This project evaluated the validity of present selection measures for entry into the Basic Journalism and Basic Broadcaster courses to determine if the English Diagnostic Test (EDT), given to all course entrants, adds to the validity of the present test composites in predicting training outcomes. Data were collected on 228 enlisted service personnel (from the Air Force, Army, Navy, and Marine Corps) who enrolled in the two journalism courses during FY82. Multiple regression analyses were conducted for the Armed Services Vocational Aptitude Battery (ASVAB) composite test scores and the EDT raw scores using final school grades as the criterion. Data were also analyzed by service membership to determine whether the results of the full sample were applicable for specific service groups. The analyses indicated that the Air Force General test composite (GEN), which includes Arithmetic Reasoning, Word Knowledge, and Paragraph Comprehension subtests, had higher predictive validity than the EDT or any of the other service composites. A GEN cutoff score at the 65th percentile is recommended for entry into both journalism courses.



PREFACE

This is an interim report on improving the selection accuracy of students in the joint service training program in journalism-related courses. The report covers the period of April 1983 to November 1983. It was completed under the auspices of Personnel Qualifications, which is part of a larger effort in Force Acquisition and Distribution. It was subsumed under project number 77191819, "Development and Validation of Selection Methodologies" and was executed as part of the Air Force Human Resources Laboratory's responsibility for improving Air Force selection and classification systems.

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ENGLISH DIAGNOSTIC TEST: VALIDATION FOR JOURNALISM-RELATED PROGRAMS

I. INTRODUCTION

The Defense Information School (DINFOS) at Fort Benjamin Harrison, Indiana, conducts training for the Basic Journalism Course (BJC) and the Basic Broadcaster Course (BBC). Enlisted personnel from all United States Armed Services attend these courses. Each service has specific aptitude requirements for entry into BJC or BBC. These requirements are minimum composite scores derived from the Armed Services Vocational Aptitude Battery (ASVAB) (Ree, Mullins, Mathews, & Massey, 1982), which is administered prior to enlistment. The composites used by each service and the minimum aptitude percentile equivalent scores currently needed for entry into the DINFOS courses are as follows:

Air Force - General (GEN) 70
Marine Corps - General-Technical (GEN) 69
Navy - Clerical (CL) 50
Army - Skilled Technical (ST) 50

The subtests that compose each of these composites are shown in Table 1.

Table 1. Subtests and Service Composites

Subtest	Composite GEN[a]	CL[b]	ST[c]
Arithmetic Reasoning (AR)	X		
Word Knowledge (WK)	X	X	X
Paragraph Comprehension (PC)	X	X	X
Numerical Operations (NO)		X	
Coding Speed (CS)		X	
General Science (GS)			X
Mathematics Knowledge (MK)			X
Mechanical Comprehension (MC)			X

[a]GEN = Air Force and Marine Corps General composite.
[b]CL = Navy Clerical composite.
[c]ST = Army Skilled Technical composite.

These specific classification requirements are in addition to minimum ASVAB test scores required for service qualification. In addition, prospective trainees must possess basic English language skills. For several years, the DINFOS English Diagnostic Test (EDT) has been administered to personnel upon entry into BJC or BBC. Those scoring below 40 on this 64-item test are given 3 weeks of remedial training before beginning regular BJC or BBC training. The remedial language training covers grammar, usage, sentence structure, word choice, and capitalization.

In FY82, 535 service personnel entered BJC. Of these, 16.1% were academic failures. Of those passing the EDT, only 11.5% were BJC academic failures. These findings suggested that the EDT might be useful in screening enlistees prior to entry into training. Whether this test had appreciable predictive validity in addition to that possessed by current ASVAB measures, however, had not been subject to systematic investigation.

The purpose of the present study was twofold: (a) to evaluate the validity of present selection measures against BJC and BBC training criteria and (b) to determine if the EDT adds to the validity of the present measures in predicting training outcomes.

II. METHOD

Subjects

The data were based on 228 enlisted service personnel who were enrolled in BJC or BBC during FY82. No distinction was made between those who completed BJC and those who completed BBC. Fifty-seven percent of the sample were male, 84% were white, and the average age was 21.1 years. The overall academic failure rate in the sample was 18.9%. There were 132 service representatives from the Army, and 48 from the Navy. Since the Air Force and the Marine Corps used similar aptitude composites, the 48 individuals from these services were combined into one group for analytic purposes.

Data Analysis

Forward hierarchical multiple regression (Cohen & Cohen, 1975) was performed in the study. The criterion measure was the final grade obtained from BJC or BBC. Final school grades are recorded as scores ranging between 50 and 100. The predictor measures, in order of presentation in the regression equations, were first, the ASVAB composite test scores from the individuals' respective service and second, the EDT raw score. Composite test scores preceded the EDT scores in the hierarchical regression since the former scores would be available before the latter scores.

III. RESULTS AND DISCUSSION

Two sets of multiple regression analyses were performed, corresponding to two different ways of treating the correlations. First, multiple regression analysis utilized correlations that were uncorrected for restriction in standard deviations due to selection. The results of these analyses show the predictive validities that are obtained directly from the observed data. The samples used in this study consisted of highly qualified individuals who would vary less in their test performance than the general population. As shown in Table 2, the restriction in talent is reflected by smaller standard deviations in the composite scores for each sample. A second set of multiple regression analyses utilized correlations that were corrected for these restrictions. The corrections provided estimates of correlations based on the full range standard deviations, as would be observed in an unrestricted sample.

Table 3 summarizes the results of the multiple regression analyses when all four services are combined into one sample. EDT significantly increased the overall predictive validity when either the CL composite or the ST composite was used as the initial predictive composite. When GEN was used, EDT failed to significantly increase overall prediction. Moreover, the predictive validity of GEN alone was greater than the overall predictive validities of the CL composite and EDT or of the ST composite and EDT. Thus, GEN is the most valid predictor of school success.

Table 2. Population and Sample Standard Deviations of the Service Composites

Subtest	Composite		
	GEN[a]	CL[b]	ST[c]
Population[d]	18.527	16.017	35.302
Full Sample	8.815	12.749	17.992
Air Force and Marine Corps	5.353	12.974	18.457
Navy	11.126	8.692	23.350
Army	8.412	13.475	14.319

[a]GEN = General composite (AR + WK + PC).
[b]CL = Clerical composite (WK + PC + NO + CS).
[c]ST = Skilled Technical composite (WK + PC + GS + MK + MC).
[d]Standard deviations are based on the 1980 Profile of American Youth (Department of Defense, 1982).

Table 3. Prediction of Final School Grade from the Service Composites and the English Diagnostic Test (EDT) for the Full Sample (N = 228)

Predictors	Uncorrected R^2		Corrected R^2	
	R^2	R^2-change	R^2	R^2-change
GEN[a]	.282		.634	
GEN, EDT	.293	.011	.640	.006
CL[b]	.129		.380	
CL, EDT	.186	.057*	.421	.041*
ST[c]	.123		.352	
ST, EDT	.157	.034*	.377	.025*

[a]GEN = General composite (AR + WK + PC).
[b]CL = Clerical composite (WK + PC + NO + CS).
[c]ST = Skilled Technical composite (WK + PC + GS + MK + MC).
*R^2 change is significant at $p < .01$.

The data were also analyzed by service membership. The purpose here was to investigate whether the results of the full sample were applicable for specific service groups.

Table 4 summarizes the results of the multiple regression analyses for a sample consisting of Air Force and Marine Corps service personnel. The two service groups were combined since both services use similar selection levels on the GEN composite. Inspection of the uncorrected R^2 values reveals poor predictive validities for all service composites, alone and in combination with EDT. When the correlations are corrected for restriction in range, however, the corrected R^2 values supported the previous finding that GEN has greater predictive validity than either combination of CL and EDT or ST and EDT. EDT also failed to increase overall predictive validity over any of the service composites.

Table 4. Prediction of Final School Grade from the Service Composites and the English Diagnostic Test (EDT) for the Combined Air Force and Marine Corps Sample (N = 48)

	Uncorrected R^2		Corrected R^2	
Predictors	R^2	R^2-change	R^2	R^2-change
GEN[a]	.081		.515	
GEN, EDT	.090	.009	.520	.005
CL[b]	.097		.303	
CL, EDT	.098	.001	.303	.000
ST[c]	.026		.088	
ST, EDT	.031	.005	.093	.005

[a]GEN = General composite (AR + WK + PC).
[b]CL = Clerical composite (WK + PC + NO + CS).
[c]ST = Skilled Technical composite (WK + PC + GS + MK + MC).

The results of the multiple regression analyses for the Navy sample are summarized in Table 5. As shown earlier, EDT significantly increased the overall predictive validity when combined with CL or ST. This result also holds for GEN, although when corrected R^2 values are used, the increase in R^2 values due to EDT was nominal. The second previous finding was also replicated: GEN alone has greater predictive validity than the combined predictive validity of either CL and EDT or ST and EDT. The result held for both the uncorrected and corrected R^2 values.

Table 5. Prediction of Final School Grade from the Service Composites and the English Diagnostic Test (EDT) for the Navy Sample (N = 48)

	Uncorrected R^2		Corrected R^2	
Predictors	R^2	R^2-change	R^2	R^2-change
GEN[a]	.495		.737	
GEN, EDT	.595	.100*	.784	.053*
CL[b]	.146		.605	
CL, EDT	.415	.269*	.729	.124*
ST[c]	.202		.367	
ST, EDT	.459	.257*	.571	.204*

[a]GEN = General composite (AR + WK + PC).
[b]CL = Clerical composite (WK + PC + NO + CS).
[c]ST = Skilled Technical composite (WK + PC + GS + MK + MC).
*R^2 change is significant at $p < .01$.

Table 6 summarizes the results of the multiple regression analyses for the Army sample. These results also agree with previous findings. Specifically, GEN alone has high predictive validity, and EDT contributes an insignificant increase in explained variance beyond that attributed to GEN.

Table 6. Prediction of Final School Grade from the Service Composites and the English Diagnostic Test (EDT) for the Army Sample ($N = 132$)

	Uncorrected R^2		Corrected R^2	
Predictors	R^2	R^2-change	R^2	R^2-change
GEN[a]	.235		.598	
GEN, EDT	.246	.011	.604	.006
CL[b]	.183		.455	
CL, EDT	.219	.036*	.479	.024*
ST[c]	.137		.491	
ST, EDT	.160	.023	.504	.013

[a]GEN = General composite (AR + WK + PC).

[b]CL = Clerical composite (WK + PC + NO + CS).

[c]ST = Skilled Technical composite (WK + PC + GS + MK + MC).

*R^2 change is significant at $p < .05$.

The results from the multiple regression analyses for each of the services and for the full sample may be summarized as follows:

1. EDT significantly increases predictive validity when combined with either the CL or ST composites.
2. GEN composite alone has greater predictive validity than either of the preceding combinations of measures.
3. EDT and GEN together do not have significantly higher predictive validity than GEN alone.

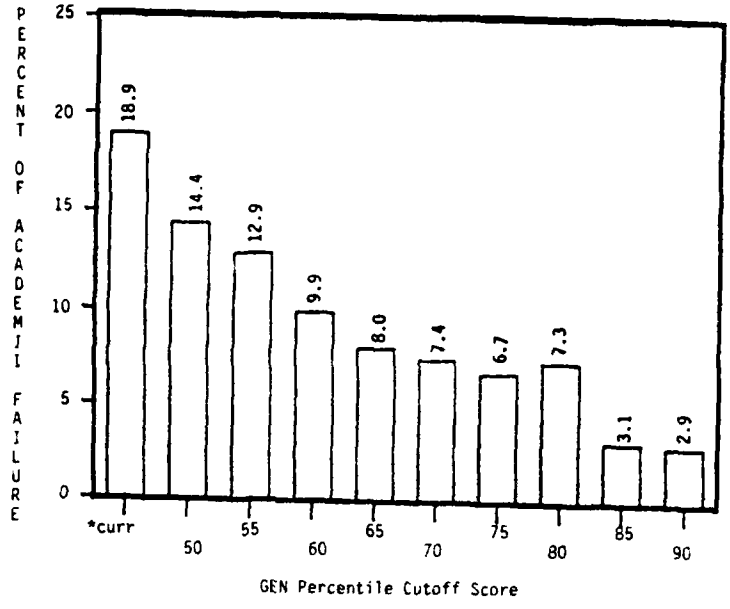
IV. RECOMMENDATIONS

The following observations and recommendations are offered:

1. Use the GEN composite for qualifying all enlisted service personnel for entry into BJC and BBC. The GEN composite has greater validity than either CL or ST. If the GEN composite is used, EDT does not increase the validity for predicting school success. Adopting the GEN composite has the further advantage of using available information and does not require the added cost (time, material, and manpower) of administering the EDT.

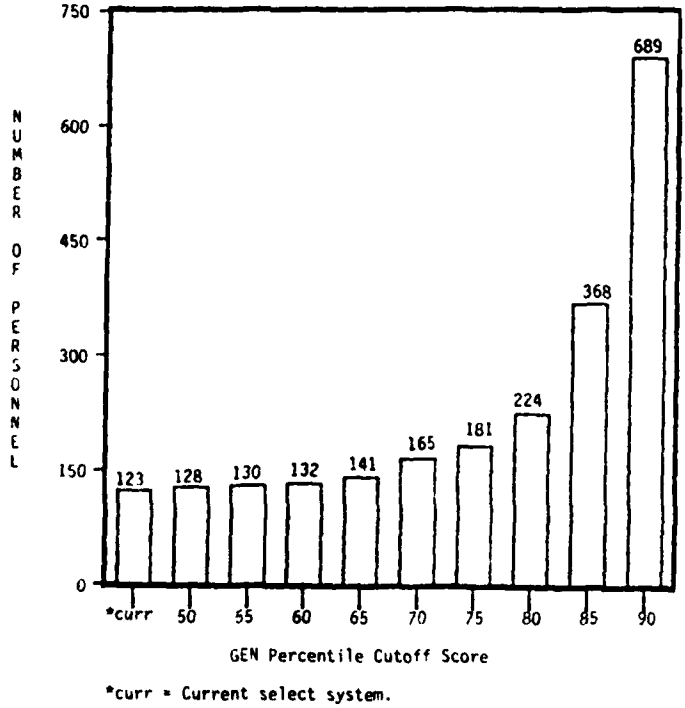
A cutoff score corresponding to the 65th percentile on the GEN is recommended. A GEN score below the 65th percentile is not recommended because the admittance of a greater number of unqualified personnel increases the need for remedial training; moreover, the academic failure rate may increase. Figure 1 shows the academic failure rate of school entrants for different cutoff levels of the GEN percentile. For example, in this study, the academic failure rate of personnel with GEN 65 percentile or higher was 8.0% compared to the overall academic failure rate of 18.9%.[1] Additionally, no significant decreases in attrition are obtained until a cutoff score of 85 is applied. A GEN score above the 65th percentile is not recommended because the percent of ineligible personnel below a particular GEN cutoff score increases as the GEN cutoff score increases. The increase becomes most apparent at GEN 85. The number of personnel who would have to be considered in an applicant pool to yield 100 graduates is shown in Figure 2 for increasing levels of selectivity. Although attrition rates would decrease as successively higher cutoffs were established, this would require a dramatic increase in the applicant pool, especially beyond GEN 80. On this basis, the GEN 65 selection score is preferred.

[1]An individual who obtains a grade of less than 70 points is considered to be an academic failure.



*curr = Current selection system

Figure 1. **Academic Failure Rates for Different GEN Cutoff Scores.**



*curr = Current select system.

Figure 2. **Number of Personnel Required for Screening at Different GEN Cutoff Scores to Yield 100 Successful School Entrants.**

2. If a cutoff score corresponding to the 65th percentile leads to insufficient course enrollment, a lower cutoff score should be used to allow a greater number of personnel into the programs. This alternative, however, will also admit a greater number of less qualified individuals. As a consequence, an increased need for remedial reading training and increased academic failure rate may result. Reviewing the data in Figures 1 and 2 will help in reaching an operational decision.

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