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Emphasis on Adolescents and Young Adults

PERFORMANCE OF LEARNING DISABLED HIGH SCHOOL STUDENTS ON THE ARMED SERVICES VOCATIONAL APTITUDE BATTERY

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The University of Kansas Institute for Research in Learning Disabilities is supported by a contract (#300-77-0494) with the Bureau of Education for the Handicapped, Department of Health, Education, and Welfare, U. S. Office of Education, through Title VI-G of Public Law 91-230. The University of Kansas Institute, a joint research effort involving the Department of Special Education and the Bureau of Child Research, has specified the learning disabled adolescent and young adult as the target population. The major responsibility of the Institute is to develop effective means of identifying learning disabled populations at the secondary level and to construct interventions that will have an effect upon school performance and life adjustment. Many areas of research have been designed to study the problems of LD adolescents and young adults in both school and non-school settings (e.g., employment, juvenile justice, military, etc.)

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Cooperating Agencies

Were it not for the cooperation of many agencies in the public and private sector, the research efforts of The University of Kansas Institute for Research in Learning Disabilities could not be conducted. The Institute has maintained an on-going dialogue with participating school districts and agencies to give focus to the research questions and issues that we address as an Institute. We see this dialogue as a means of reducing the gap between research and practice. This communication also allows us to design procedures that: (a) protect the LD adolescent or young adult, (b) disrupt the on-going program as little as possible, and (c) provide appropriate research data.

The majority of our research to this time has been conducted in public school settings in both Kansas and Missouri. School districts in Kansas which are participating in various studies include: United School District (USD) 384, Blue Valley; USD 500, Kansas City; USD 469, Lansing; USD 497, Lawrence; USD 453, Leavenworth; USD 233, Olathe; USD 305, Salina; USD 450, Shawnee Heights; USD 512, Shawnee Mission, USD 464, Tonganoxie; USD 202, Turner; and USD 501, Topeka. Studies are also being conducted in Center School District and the New School for Human Education, Kansas City, Missouri; the School District of St. Joseph, St. Joseph, Missouri; Delta County, Colorado School District; Montrose County, Colorado School District; Elkhart Community Schools, Elkhart, Indiana; and Beaverton School District, Beaverton, Oregon. Many Child Service Demonstration Centers throughout the country have also contributed to our efforts.

Agencies currently participating in research in the juvenile justice system are the Overland Park, Kansas Youth Diversion Project and the Douglas, Johnson, and Leavenworth County, Kansas Juvenile Courts. Other agencies have participated in out-of-school studies--Achievement Place and Penn House of Lawrence, Kansas, Kansas State Industrial Reformatory, Hutchinson, Kansas; the U.S. Military; and the Job Corps. Numerous employers in the public and private sector have also aided us with studies in employment.

While the agencies mentioned above allowed us to contact individuals and supported our efforts, the cooperation of those individuals--LD adolescents and young adults; parents; professionals in education, the criminal justice system, the business community, and the military--have provided the valuable data for our research. This information will assist us in our research endeavors that have the potential of yielding greatest payoff for interventions with the LD adolescent and young adult.

ABSTRACT

The Armed Services Vocational Aptitude Battery (ASVAB Form 5) was administered to 24 LD high school students representing nine high schools. A total of 29.2% of the LD subjects were found to qualify for enlistment in the Army based on the requirements for high school graduates, while 16.7% qualified based on the non-high school graduate requirements. Based on high school graduate requirements, 33.3% qualified for the Marine Corps, 37.5% qualified for the Navy, and 4.2% qualified for the Air Force. The vocational areas in which the students qualified most frequently were Skilled Technical, Clerical, Combat Arms, Machine and Vehical Operators and Food Service, and General Maintenance. Results suggest the need for an LD identification procedure for early screening in the enlistment process along with a comprehensive intervention program.

Performance of Learning Disabled High School Students on the Armed Services Vocational Aptitude Battery

A major concern for learning disabled individuals in post-school environments is the degree of access they have to the work force and various job markets. Many LDs lack basic job seeking/entrance skills but are found to respond favorably to job-related training (Regan & Deshler, 1979; Mathews & Fawcett, 1980). However, since many mildly handicapped individuals never get a chance to receive such on-the-job training by failing to meet specific job requirements, a great number of them are underemployed and in some cases unemployed (Alley & Deshler, 1979). In terms of the job market, the Military represents a sizable segment of the work force. Even without the draft, over 300,000 individuals enter the Armed Services each year to find occupational training, work, and security. To attract new employees, recuitment programs emphasize educational opportunity along with a comprehensive benefit package including: regularly scheduled promotions and numerous additional benefits such as veterans assistance for buying homes and qualifying for governmental employment (Shanff & Gordon, 1978). The benefits and advancement opportunities are numerous and enlistments are needed due primarily to the termination of the draft (U.S. News and World Report, 1977) and the "baby slump" of the late 1960s. Thus, the military appears to be a source of promising employment opportunity; however, can the learning disabled (LD) meet the current mental ability and aptitude requirements for military enlistment?

There are several reasons to suspect that LD individuals have a high probability of being rejected by the Armed Services. Boorstein (1975), for example, reported that high school graduates account for fewer premature discharges and cause less disciplinary problems in the Service than high school dropouts. In fact, in 1978 Army recruiters were directed to recruit two high school graduate males for each non-high school graduate male. The Army's apparent bias against high school dropouts is likely to affect learning disabled adolescents who tend to have a high dropout rate than their non LD-peers.

In view of the potential benefits available to LD adolescents and young adults in the military service, there is a need to examine more carefully the accessibility of such benefits. In particular, there is a need to know whether or not LD adolescents and young adults are being accepted into the Military Services, and in what proportion relative to non-LD populations. Further, there is a need to know whether or not the training LD individuals receive in military service develops their skills optimally.

The entrance examination presently used by the Armed Forces is the Armed Services Vocational Aptitude Battery (ASVAB) which is an objective test requiring, at the minimum, reading and test-taking skills. Since learning disabled individuals have problems in those skill areas (Deshler, 1978) and since they might experience more anxiety related to test-taking than others due to a history of failure (Sarason, 1972), they are likely to fail the test or to not attempt it. Besides, Cronback (1977) has noted that the ASVAB is a very difficult battery.

The ASVAB is currently being modified to ensure a more accurate assessment of military applicants' reading abilities (Flyer, 1978). However no effort has been made to analyze the battery's difficulty level for the learning disabled. Consequently, a thorough analysis of the ASVAB seems warranted in light of its potential impact on job opportunities for the learning disabled.

The ASVAB consists of 10 power and 2 speed tests requiring a total administration time of three hours. The three subtests (Word Knowledge, Arithmetic Reasoning, and Space Perception) make up the Armed Forces Qualification Test (AFQT) used to determine an individual's cognitive ability for military service. The Women's Standard Test (WST), used in the Army for the same purpose consists of Word Knowledge and Arithmetic Reasoning. Cutoff scores, which vary for high school graduates and non-high school graduates, also vary among the different branches of the Armed Services, which, in turn, have additional requirements related to age and years of education. Because of its less stringent enlistment standards and the greater numbers of enlistments, and hence higher proportion of LD individuals, the Army will be the focus of this study.

For vocational classification purposes, the Army uses 10 composite scores, determined by adding the raw scores of particular subtests on the ASVAB.

Individuals who qualify for the Army, but fall between the 16th and 31st percentile on the mental capacity qualification test (AFQT for men and WST for women), must score 90 or above on at least two of these 10 vocational aptitude scores. Those scoring at or above the 31st percentile can enter the Army with only one score at or above 90 (Massar, 1980).

Method

Subjects

Requests for ASVAB scores were sent to a total of 59 school districts, including 56 districts in Kansas, two districts in Iowa, and one district in Missouri. Twenty districts responded to our request for information. As a result, scores on 24 students representing nine high schools were accumulated. All students had been diagnosed learning disabled according to State of Missouri, Kansas, & Iowa guidelines by the school district. Subjects were enrolled in learning disabilities programs at the time of the ASVAB testing. The number of students by sex and grade is indicated in Table 1.

Insert Table 1

Procedure

The ASVAB (Form 5) was administered during one of the past three academic years, i.e., 1977-78, 1978-79, or 1979-80. Prior to the 1979-80 academic year, LD students completed the ASVAB along with non-LD students through their own personal interest and initiative without prior knowledge that scores might be used for research purposes. During academic year 1979-80, the LD teachers encouraged the students to take the test, emphasizing the personal benefits to be derived from receiving feedback on their vocational potential. The test was administered by either an individual in a military uniform or by a Civil Service employee dressed in civilian clothes. The Administration procedures were the same for all testings. None of the test administrators were aware that LD students were participating. After the testing the Military communicated the scores to the high school counselors.

Results

Table 1 provides the results for Army enlistment eligibility by grade and sex for all students. Of the 24 LD students taking the ASVAB, seven (29.2%) qualified for Army enlistment. However, when only 12th-grade students are considered, four of the seven (57.1%) qualified.

Table 2 presents the results in terms of military mental category with the associated percentile groupings. The median, mean, and standard deviation for the students on the 12 subtests and the six composites in percentiles based on the norming population are found in Table 3. Even though one student scored much higher than the other students, the median scores were below the 20th percentile for 5 of the 6 composites and for 7 of the 12 individual subtests. The highest median for the composite scores in percentiles was 31.00 on Mechanical, while a median of 52.00 (on Space Perception) was the highest percentile for the individual subtests. Table 4 provides the number of students scoring at or above 90 on the 10 Army Vocational Aptitude Composites. The Skilled Technical area included the largest number of subjects scoring at or above 90. The fields of Clerical, Combat Arms, Vehicle Operator and Food Service, and General Maintenance each had four subjects meet the 90th percentile criterion. Seven Mental-Category-IV subjects scored above the minimun on the mental capacity test, but failed to obtain two scores at or above 90 in the aptitude area. Therefore, these students would not be able to enlist in the Army. Three of these individuals could join the Marine Corps, however, while four could join the Navy. In total, eight (33.3%) individuals qualified for enlistment in the Marines, nine (37.5%) for the Navy, while only one (4.2%) qualified for the Air Force.

Discussion

Results of the present study clearly indicate that the LD population has a relatively poor chance of enlisting in the Army. Based on ASVAB scores 29.2% of LD students qualified compared to 80% of the non-LD population (Masser, 1980).

It also appears that most LD students are not given the opportunity to determine whether or not they are eligible for military service since few school districts encourage their LD students to take the ASVAB. Therefore, the first step towards increasing the LD population's vocational opportunity in the Military for LD adolescents is to inform school staff that the military is a viable option for some LD students and to encourage LD students to take the ASVAB. Whether or not they are considering enlistment, taking the ASVAB provides practice in taking the type of test frequently used by businesses to determine one's vocational aptitude. Finally, by taking the battery, LD students will become more aware of available occupational choices.

Students qualifying for the Army would be eligible for formal training in a variety of major vocational areas, particularly in the Skilled Technical field which includes recreational specialist, career counselor, and other semi-technical vocations. Results also indicate that many learning disabled personnel might be eligible for mechanical occupations and combat arms training.

The range of occupational choices in the Marine Corps and the Navy, for which nine LD individuals qualified, is more limited. Because of their relative low scores, the students who qualified in the Navy would receive "hands on" training in a restricted number of jobs rather than

being able to attend a formal vocational training course. The Air Force is virtually unavailable to the learning disabled based on results of the present study.

In order to generalize these findings and determine the specific occupational specialities for which LD adolescents tend to qualify, future research must consider ASVAB scores on a larger number of potential LD enlistees.

In an analysis of LD students' scores on individual subtests of the ASVAB battery, the highest median percentile scores were found on tests which present items predominantly through pictures or figures rather than printed words and numbers (e.g., Space Perception, Mechanical Comprehension).

This finding suggests that the learning disabled enlistee may be more receptive to nonverbal, concrete instruction which emphasizes practice rather than instruction which heavily depends upon student reading. Consequently, the LD enlistee may fare better in the Navy than in the army where formal training courses coupled with heavy reading requirements may result in discharge for LD individuals preforming poorly on such tasks. Being provided initial "hands on" training, which would be more routinely scheduled in the Navy, may help avoid early failure in the service.

Because the students did so poorly on subtests containing only words or numbers, the validity of the ASVAB is questionable for learning disabled individuals with significant deficits in reading and/or mathematics. By definition, a learning disabled individuals's level of intelligence falls within the normal range; however, tests such as the ASVAB which require individuals to decode printed words and numbers may not accurately assess the true mental capacity of the learning

disabled student. It, therefore, seems appropriate that a different mode of administration be used on an experimental basis for those who are learning disabled. Evaluating the results of such a modification in the ASVAB administration would help assess the validity of this battery for the LD population. The LD students' poor performance on the ASVAB as currently administered may be more indicative of deficient reading skills than of poor vocational potential since these two variables are not necessarily highly correlated for the LD population.

Results of the present study indicate that relatively few learning disabled individuals qualify for the Armed Services. However, since there probably are some in the Army, it is important to identify those who enter the Army, monitor their experience, and determine whether or not ASVAB scores are a predictor of their performance. To date, systematic investigation of the prevalence of learning disabilities in the Armed Services has not been conducted. One research study used "failure in Army Basic Training" as the criterion for learning disabilities and then attempted to determine which subtests on a psychological battery significantly discriminated between the "successful" and the "unsuccessful" recruits (Andrulis, 1977). However, this study is confounded by the factors of motivation, cultural and socioeconomic background, and academic training as possible causes for unsuccessful performance in Basic Training.

The present study pointed out possible inequities and difficulties faced by LD individuals attempting to gain access to the military based on ASVAB scores. To further study this problem, the IRLD is engaged in

the following lines of research. First, identification of LD enlistees for the purpose of adapting training methods and subsequently preventing failure and to facilitate the differentiation between LD individuals and those lacking in motivation and discipline will be studied. The identification procedure which will be conducted in 1980-81 is based on work of Alley, Deshler, Mellard and Warner,(see Research Reports No. 9, 10, 11 - IRLD) with application of Bayesian Screening procedures and other LD markers from epidemiology research of IRLD (see Research Reports 12-20). Efforts are also being conducted to obtain names of LD individuals in the services through parents involved in the Association for Children with Learning Disabilities (ACLD). It is proposed that profiles of these individuals be developed to enhance the accuracy of any pre-entry screening procedure for identifying LD enlistees. In additon to initial identification of an LD population in the Armed Services, the IRLD plans an extensive follow-up study to determine the specifics of military experiences as they relate to the LD.

REFERENCES

Alley, G.R., & Deshler, D.D. Teaching the learning disabled adolescent: Strategies and methods. Denver: Love, 1979.

Andrulis, R.S. Development of an assessment battery for the identification of learning disabilities among army volunteers (Technical Report 0039-2). Alexandria, Va: U.S. Army Research Institute for the Behavioral and Social Sciences, 1977.

Army occupational handbook. Washington, D.C.: U.S. Government Printing Office, 1976.

Boorstein, D. Volunteer army. Editorial Research Reports, 1975, 1, 444-462.

Bring back the draft. U.S. News and World Report, February 14, 1977, pp. 55-58.

Cronback, L. Congressional Record, September 7, 1977, p. H8976.

Deshler, D. Psycho-social characteristics of learning disabled adolescents. In L. Goodman, L. Mann, & L. Widerholt (Eds.), Teaching the learning disabled adolescent. Boston: Houghton Mifflin, 1978.

Flyer, E. Personal communication with the Department of Defense, Washington, D.C., June 6, 1978

Flyer, E. Personal communication with the Department of Defense, Washington, D.C., June 29, 1979.

Massar, D. Personal communication with the U. S. Army Recruiting Command, Fort Sheridan, Illinois, 2-11-80.

Mathews, R. M. & Fawcett, S. B. Behavioral assessment of occupational skills of learning adolescents (Research Report No. 6). Lawrence, Kansas: The University of Kansas Institute for Research in Learning Disabilities 1980.

Regan, M. & Deshler, D. D. Inservice training as preparation for vocational education to provide effective learning enviroment for special needs students. Journal of Career Development, in press.

Sarason, S.B. Experimental approaches to test anxiety. In C. Speilberger (Ed.), Anxiety: Current trends in theroy and research. New York: Academic Press, 1972.

Sasmore, R. Personal communication with the U.S. Army Research Institute for the Behavioral and Social Sciences, June 6, 1978.

Sharff, L.E., & Gordon, S. (Eds.) 1978 Uniformed services almanac. Washington, D.C.: Uniformed Services Almanac, Inc., 1978.

Suddenly--more volunteers than the services can use. U.S. News & World Report, March 24, 1975, pp. 43-44.

The draft: Both sides of debate. U.S. News & World Report, February 14, 1977, pp. 59-60.

Table 1

Number of Learning Disabled Students Qualifying for Army Enlistment Based on ASVAB Scores[a]

	Grade at Time of ASVAB Administration						
	10th		11th		12th		
	Male	Female	Male	Female	Male	Female	Total
Qualified	2	0	0	1	3	1	7
Not Qualified	4	2	5[b]	3	2	1	17
Total Students Taking ASVAB	6	2	5	4	5	2	24

[a]The General Science Biology (GSB) score was estimated to be one-half of the General Science (GS) subtest score since the GSB score was not included in the ASVAB results communicated to the high school counselors. The GSB score is used in the computation of two of the Ten Army Vocational Aptitude Area composites.

[b]One 11th-grade male stopped taking the ASVAB after approximately one hour. His actual scores were not received. It is assumed that this individual did not qualify for Army enlistment. The student reported to his teacher that he had great difficulty reading the test items and left the testing room because of his frustration.

Table 2

Military Mental Category of LD High School Students

Mental Category[a]	Grade at Time of ASVAB Administration						
	10th		11th		12th		
	Male	Female	Male	Female	Male	Female	Total
Category V (0-9%)	2	1	2	1	1	1	8
Category IV (10-30%)	3	1	3	2	3	0	12
Category IIIB (31-49%)	1	0	0	1	0	1	3
Category II (65-92%)	0	0	0	0	1	0	1
Total							24

[a]The Military Mental Category classification is based on the AFQT score (sume of the Word Knowledge, Arithmetic Reasoning and Space Perception subtests of the ASVAB) for men and the WST score (sum of Word Knowledge and Arithmetic Reasoning) for women when being considered for enlistment in the Army. None of the students were classified into Category IIIA (50-64%) Category I (93-99%).

[b]The numbers in parentheses represent the range of percentile scores for each mental category based on the scores of the population used to norm the ASVAB.

Table 3

Percentile Scores on Subtests and High School Composites of the ASVAB

	Median	Mean	Standard Deviation
Subtest[a]			
General Information (GI)	22.00	26.22	22.00
Numerical Operations (NO)	10.00	19.04	26.57
Attention to Detail (AD)	29.00	35.00	26.89
Word Knowledge (WK)	12.00	20.61	19.86
Arithmetic Reasoning (AR)	22.00	22.78	16.87
Space Perception (SP)	52.00	44.65	20.28
Mathematics Knowledge (MK)	14.00	18.09	15.24
Electronics Information (EI)	8.00	15.83	17.58
Mechanical Comprehension(MC)	29.00	32.78	21.52
General Science (GS)	16.00	22.39	20.20
Shop Information (SI)	17.00	21.65	16.37
Automotive Information(AI)	13.00	24.61	26.23
High School Composites[b]			
Verbal = WK + GI + GS	9.00	16.70	16.50
Analytic Quantitative = AR + MK	9.00	15.18	13.02
Clerical = 3AD + NO	16.00	22.86	26.33
Mechanical = SP + MC	31.00	32.32	16.40
Trade Technical = AI + SI	6.50	14.86	19.58
Academic Ability = WK + AR	11.00	16.59	14.81

[a]Percentiles for the subtests are based on the scores of 23 students. One student did not complete the ASVAB and, therefore, no scores were received for him.

[b]Percentile scores for the composites are based on the scores of 22 students. Composite scores were not received from the school district for one student.

Table 4

LD Students Scoring at or above a Standard Scores of 90 in the Army Vocational Aptitude Areas

Vocational Aptitude Area	Number of Students Scoring 90 or above
General Technical = AR + WK[a]	2
Electronics = AR + EI + MC + SI	2
Clerical = AD + WK + AR	4
Motor Maintenance = MK + EI + SI + AI	3
Surveillance and Communication = WK + AR + SP	1
Combat Arms = AD + AR + SP + SI	4
Field Artillery = GI + AR + MK + EI	2
Operator and Food Service = GI + AI	4
Skilled Technical = AR + MK + GSB	5
General Maintenance = AR + MC = AI = GSB	4

[a]The abbreviations represent the different ASVAB subtests incorporated into the formulas for the Vocational Aptitude Area composites.