

Navy Personnel Research and Development Center

San Diego, California 92152-7250 AP-96-2 March 1996



**BIBLIOGRAPHY OF REPORTS
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**Bibliography of Reports
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Foreword

The Navy Personnel Research and Development Center (NPRDC) is an applied research center, contributing to the personnel readiness of the Navy and Marine Corps. The Center develops better ways to attract and select the most qualified people for naval service, to assign them where they are most needed, to train each one effectively and efficiently, and to manage personnel resources optimally. By combining a deep understanding of operational requirements with first-rate scientific and technical abilities, the Center is unique in being able to develop new, useful knowledge while refining technology to address people-related issues. This dual expertise permits the Center to develop a technology base for improving the use of human resources within Navy systems and to apply state-of-the-art technology to solve emerging problems.

The research and development (R&D) methods used by NPRDC are derived from behavioral, cognitive, economic, and social sciences as well as from applied mathematics, statistics, and computer science. The application of these methods results in tangible products of use to the Navy and Marine Corps. NPRDC constantly searches for technological opportunities to improve personnel readiness and to reduce manpower costs. The Center is accountable to the Chief of Naval Personnel, its sponsors, and its customers for high productivity, strict ethics, honesty, integrity, professionalism, and perspective.

NPRDC seeks to do as much of its work as possible in the operational settings where final products are intended to be used. This approach ensures that the needs of customers are met and that the customers themselves become familiar with the operational capabilities of the particular products.

This bibliography contains an abstract of each technical report published and approved for public release in FY95.

A list of journal articles is also provided. Published reports are listed by appropriate subject categories for reference convenience. The scope of each category is defined below.

Workforce Management develops new computer-based systems and methods for allocating manpower resources, developing personnel inventories, and distributing or assigning those personnel to improve military readiness and control costs.

Personnel and Organizational Assessment develops and evaluates systems for recruiting, selecting, classifying, and utilizing military personnel to improve performance. Serves as the lead Department of Defense R&D laboratory for the development of a Computerized Adaptive Testing version of the Armed Services Vocational Aptitude Battery (CAT-ASVAB).

Classroom and Afloat Training develops new educational and training technologies to reduce formal Navy training costs and to improve Navy training effectiveness.

Center Support includes formal reports on significant matters relating to the technical program, management, or administration of the Center and informational, orientation, and recruiting brochures.

Qualified users may request copies of publications from the Defense Technical Information Center (DTIC), 8725 John J. Kingman Road, Suite 0944, Ft. Belvoir, VA 22060-6218 (Telephone: Commercial [703] 767-8019 or Defense Switched Network 427-8032). General public may order from the National Technical Information Service (NTIS), Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161 (Telephone: Commercial [703] 487-4650). When placing report orders, it is helpful to provide NTIS with the AD number.

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and Journal Articles
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Workforce Management

Technical Report

**NPRDC-TR-95-3
November 1994
(AD-A288 576)**

Michael K. Nakada

Delayed Entry Program (DEP) Attrition: Recruits, Recruiters, Contracts, and Economics.

Attrition from the DEP continues to be a costly problem. It raises recruiting and training costs. This report documents the results of an investigation of historical Navy DEP behavior. It identifies factors that impact DEP attrition, and presents the specification and results of a DEP attrition forecasting model. The factors are grouped into five categories: individual attributes, DEP contract factors, recruiter attributes, economic factors, and other control factors.

The individual attributes of the recruit have a significant impact on the probability of attriting from the DEP. Those variables that characterize the DEP contract and are modifications to a contract were also significant indicators of DEP attrition. The results from the recruiter variables were, in general, disappointing. The remaining economic variable produced mixed results.

This model can serve as the foundation for a DEP management system that can alert recruiting managers to potential DEP attrition problems.

Workforce Management

Technical Note

NPRDC-TN-95-4
May 1995
(AD-A294 816)

J. P. Boyle

Daily Random Urinalysis Testing: Consequences of Deterrence Functions

This is the fifth in a series of reports concerned with developing probability models for the analysis of random urinalysis programs. A Markov daily testing model was developed. The distributions of the time to detection and the number of tests to detection were derived as a function of the daily testing rate and the conditional probability of testing positive. Deterrence functions are defined and examples are given. When the testing rate has no deterrent effect on drug use, the average time to detection decreases with increasing testing rates and the average number of tests to detection remains constant. When the testing rate has a deterrent effect, average time to detection can be minimized. The average number of tests to detection increases with increasing testing rates.

Personnel and Organizational Assessment

Technical Reports

NPRDC-TR-95-1
October 1994
(AD-A285 588)

Gerry L. Wilcove

Quality of Life in the Navy, Findings From 1990 to 1992: Navy-wide Personnel Survey. Volume 1: Research Report

The Navy-wide Personnel Survey has been administered to over 20,000 officers and enlisted personnel for each of the past 4 years (1990-1993). Its purpose is to provide feedback to policy makers and managers on key personnel issues. This report presents the results obtained from the first three surveys on quality-of-life issues connected with voluntary college-level education, first skills training, family support programs, child-care services, leadership training, living conditions (housing), recreational programs, and Navy exchanges.

NPRDC-TR-95-4
January 1995
(AD-A)

Elyse W. Kerce

Quality of Life in the U.S. Marine Corps

A comprehensive assessment of Quality of Life (QOL) in the Marine Corps was conducted using perceptual data collected with a questionnaire designed for this effort and objective data from extant HQMC data files. The assessment utilized a life domain framework, in which were included the domains of residence, neighborhood, leisure and recreation, health, friends and friendships, marriage/intimate relationship, relations with children, relations with other relatives, income/standard of living, job, and self. Structural equation modeling techniques were used to specify the relationships among life domains, global QOL, and organizational outcomes such as performance, retention, and personal readiness. Recommendations for future assessments of QOL are included, based on the outcome of measurement models. Global quality of life was shown to have significant effects on organizational outcomes. Junior enlisted personnel were more negative on all measures of global QOL. Detailed discussions of each life domain provide in-depth information for planners and program managers.

NPRDC-TR-95-5
January 1995
(AD-A290 709)

Marie D. Thomas

Gender Differences in Conceptualizing Sexual Harassment

The purpose of this study was to identify gender differences in interpreting behaviors as sexually harassing and to investigate variables that Navy enlisted personnel consider when making such judgments. Three hundred and forty-seven enlisted men and women from three San Diego Navy sites took part in the study. Each participant was administered a questionnaire, and a subsample of personnel participated in focus groups.

Personnel and Organizational Assessment

Technical Reports

Key findings are:

1. The scenarios considered by the Navy to depict sexual harassment were viewed by the study participants as moderately to extremely serious behaviors, and the more serious behaviors were considered sexual harassment.
2. Mild, ambiguous behaviors, such as dirty jokes and coarse language, were generally not viewed as sexual harassment by the study participants.
3. Overall, women rated the harassment behaviors as more serious than did men, and women were more likely than men to regard these behaviors as sexual harassment.
4. Men slightly overestimated women's seriousness and sexual harassment ratings of the behaviors. Women greatly underestimated men's ratings.
5. Participants were more likely to rate scenario behaviors as interfering with work performance and creating a hostile environment than they were to label the behaviors "sexual harassment."
6. Women participating in focus groups indicated that their male co-workers often expressed negative attitudes toward Navy women and were punishing women for the Navy's current sensitivity to sexual harassment.
7. While men did not express overtly negative attitudes toward women in the focus groups, there was general agreement that women often were overly sensitive and quick to label a behavior as sexual harassment.

Personnel and Organizational Assessment

Technical Notes

NPRDC-TN-95-1
April 1995
(AD-A298 409)

John Kantor
Michael Ford
Gerry Wilcove
Sean P. Gyll

Navy-wide Personnel Survey (NPS) 1994: Statistical Tables for Enlisted Personnel

A brief review of the history of polychotomous (i.e., multi-category) item response models is provided. After describing a new polychotomous item response model (Model 8), examples of the Operating Characteristic Functions obtained when Model 8 is applied to real test data are given. In general, inspection of "goodness-of-fit" plots indicates that Model 8 provides superior data fit and higher item information functions than the well-known 3-parameter logistic (dichotomous) item response model. A simulation of computerized adaptive testing (CAT) that used the actual item responses of applicants for military enlistment shows that Model 8 would be superior to the 3-parameter logistic model in a CAT environment. In this investigation, Model 8 increased test reliability by an amount that is equivalent to a 25% increase in test length.

NPRDC-TN-95-2
April 1995
(AD-A298 342)

John Kantor
Michael Ford
Gerry Wilcove
Sean P. Gyll

Navy-wide Personnel Survey (NPS) 1994: Statistical Tables for Officers

The fifth annual Navy-wide Personnel Survey was mailed in October 1994 to a random sample of 17,000 active duty enlisted personnel and officers. Completed questionnaires were accepted through mid-January 1995. The adjusted return rate was 47%. Survey topics included detailing and the assignment process, quality of life programs, leadership training, organizational climate, and health issues. Responses were weighted by paygrade to allow generalization of sample results to the Navy population. Responses of officers are broken down by paygrade and other important demographic variables.

NPRDC-TN-95-5
July 1995
(AD-A297 580)

F. L. Schmidt
J. E. Hunter
W. L. Dunn

Potential Utility Increases From Adding New Tests to the Armed Services Vocational Aptitude Battery (ASVAB)

This research examined whether the validity and classification utility of the Armed Services Vocational Aptitude Battery (ASVAB) could be increased by adding additional predictors. The relevant literature indicated that ASVAB validity could be augmented by adding measures of (1) perceptual ability (to increase the validity of the ASVAB measurement of general mental ability) and (2) psychomotor ability. Adding perceptual ability increased the classification utility of the ASVAB by about 3%; the dollar value of this percentage increase increases over years of use of the augmented

Personnel and Organizational Assessment

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ASVAB, eventually building up to approximately \$83 million per year. Adding both perceptual and psychomotor ability to ASVAB increased classification utility by approximately 5%. The eventual asymptotic value of this increase is \$138 million per year. Augmenting the ASVAB produced unequal performance increases for more versus less complex jobs; this fact may be of importance to Navy policy formulation.

NPRDC-TN-95-8
September 1995
(AD-A299 806)

Computerized Adaptive Testing Version of the Armed Services Vocational Aptitude Battery (CAT-ASVAB): Computer System Development

Bernard A. Rafacz

In 1979, the Computerized Adaptive Testing version of the Armed Services Vocational Aptitude Battery (CAT-ASVAB) program was initiated by the Department of Defense. One objective of the (Joint-Service) CAT-ASVAB program was to develop a distributed processing computer system capable of deploying CAT at aptitude testing sites of the United States Military Entrance Processing Command (USMEPCOM). In 1985, the CAT-ASVAB program was redirected with the initiation of the Accelerated CAT-ASVAB Project (ACAP). The purpose of ACAP was to test the feasibility of using CAT at USMEPCOM testing sites prior to initiation of another full scale development effort. To accomplish this purpose, ACAP had to develop a computer system with all of the essential Joint-Service specifications for deploying CAT. The UNIX-based computer system developed under ACAP meets this goal.

NPRDC-TN-95-9
September 1995
(AD-A299 816)

Factors Affecting the Reporting of Sexual Harassment in the Navy

S. Booth-Kewley

Only a small fraction of Navy members who experience sexual harassment use the Navy's formal grievance channels to report it. This study was conducted to identify factors associated with reporting of sexual harassment and with the filing of formal sexual harassment grievances. Telephone interviews were conducted with 228 Navy women (158 enlisted women and 70 women officers) who had been sexually harassed in the past year. The results showed that respondents were more likely to report sexual harassment if they regarded the harassment they experienced as serious, had expected positive consequences as a result of reporting, and had been encouraged to report it. Respondents were more likely to file a formal sexual harassment grievance if they regarded the sexual harassment they experienced as serious and if the harassment had involved stalking or invasion of residence. The most common reasons respondents gave for not reporting sexual harassment and for not

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Technical Notes

NPRDC-TN-95-10
September 1995
(AD-A300 198)

Thomas Trent
Steven E. Devlin

filing grievances were that their other actions worked to stop the harassment and that they were afraid of the negative consequences.

Compensatory Screening Model for B Cell Enlistment

Twenty percent of the enlistment-age youth population fail to earn a high school diploma. These nongraduates constitute a large pool of potential recruits. A review of the literature documents that high school dropouts have lower academic achievement and vocational aptitude, less employment experience, higher propensity for drug use and criminal behavior and more psychological disturbances. As a result, the armed services minimize the enlistments of nongraduates because of this group's high attrition and reputation for lower personal reliability. Thus, the Navy Recruiting Command accepts only limited numbers of nongraduates even when it is faced with significant shortfalls of qualified high school graduate applicants. To aid recruiters in accessing the nongraduate labor market, the objective of this study was to design a compensatory screening model (CSM) to assess applicants on the basis of available measures of individual attributes. The resulting model computes the probabilities of completing the first 2 years of enlistment from four application variables: number of years of education attended, education credential attained, age at application, and Armed Forces Qualification Test (AFQT) score. The CSM was operationalized as an actuarial table for use by Navy recruiters. Evaluation analyses demonstrated expected reductions in attrition and improvements in the aptitude and educational characteristics of nongraduate accessions.

NPRDC-TN-95-11
September 1995
(AD-A)

Robert F. Morrison
Rhonda M. Lovec
Barbara A. Woods
Ross R. Vickers, Jr.

Assessment of Potential for Leadership Phase I: Development of the Measures Development of the Measures

A technology was required to identify potential leaders from among recruits who did not have the technical knowledge required for direct entry into "A" schools with such requirements. To potentially fulfill this need, an experimental biodata form that emphasized teenage leadership opportunities was developed and an appropriate commercially available personality measure was identified. A major consideration during the above work was to ensure that such technology provided an equal opportunity for selection into the program regardless of race. It is recommended that the two instruments described herein be submitted to a validation process so that their ability to distinguish potential leaders from non-leaders is appropriately evaluated prior to any implementation.

Personnel and Organizational Assessment

Journal Articles and Presentation

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Hetter, R. D., Segall, D. O., & Bloxom, B. M. (1994). A Comparison of Item Calibration Media in Computerized Adaptive Testing. *Applied Psychological Measurement*, 18(3), 197-204.

Larson, G. E., & Wolfe, J. H. (1995). Validity Results for g From an Expanded Test Base. *Intelligence*, 20, 15-25.

Newell, C. E., Rosenfeld, P., & Culbertson, A. L. (1995). Sexual Harassment Experiences and Equal Opportunity Perceptions of Navy Women. *Sex Roles*, 32(3/4), 159-168.

Sadler, G. C., & Thomas, P. J. (1995). Rock the Cradle, Rock the Boat? *Naval Institute Proceedings*, 121(4/1), 51-56.

Tatum, B. C., & Nebeker, D. M. (1995). Effects of System Control and Feedback Variability on Job Performance and Affective Reactions. *Human Performance*, 8(4), 297-325.

Booth-Kewley, S., & Larson, G. E. (1995, August). *Cognitive abilities and synthetic work performance*. Paper presented at the American Psychological Association Convention. New York, NY.

Classroom and Afloat Training

Technical Reports

NPRDC-TR-95-2
October 1994
(AD-A285 590)

Meryl Sue Baker

Study to Assess Training and Doctrine Command (TRADOC) School Staff Time Available for Training Activities

Recent budget cuts have prompted the United States Army to reduce the number of civilian training developers at TRADOC schools. The purpose of this study was to determine whether TRADOC staff remaining will have sufficient time and expertise to both instruct classes and develop training. A written questionnaire was distributed to 3,200 military and civilian instructors and training developers at 16 TRADOC installations. The adjusted response rate for the combined sites was 83% (2,644). Staff reported little problem with time or expertise availability to complete training activities over the past year. However, this response may merely reflect that the staff was not yet required to perform these activities. Recommendations were for TRADOC to determine what training development tasks were not being accomplished to ensure that a training evaluation system is in place to monitor any change in the caliber of training and suggestions for overcoming training deficiencies, should they develop.

NPRDC-TR-95-6
June 1995
(AD-A)

Janet L. Weaver
Bruce M. Perrin
David Zeltzer
E. R. N. Robinson

Damage Control Training in a Virtual Environment

Effective damage control is critical so that ships can survive hostile encounters and complete their missions. The Total Ship Survivability (TSS) training doctrine explicitly describes the importance of the damage control function and the role of individuals during a mass conflagration situation. The DC environment and the current state of VE technology were examined. Four major target training groups within DC were identified, and a taxonomy of types of tasks that would benefit from VE training was developed. High level system specifications were developed for the DCA trainer, which includes communications both with Combat Systems and Engineering. Given the strengths and limitations of current VE technology it was decided to focus the system specifications on VE training systems for personnel in Damage Control Central (DCC), in particular, on the Damage Control Assistant (DCA). While there is also some console operation involved, the skills to be learned for DCC operations are primarily cognitive rather than sensorimotor. Therefore, unlike a VE trainer for DC repair and survey teams, a VE training system for the DCA would only require a minimal haptic component if it were important to simulate console operation.

Classroom and Afloat Training

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NPRDC-TR-95-7
August 1995
(AD-A298 102)

Henry Simpson
C. Douglas Wetzel
H. Lauren Pugh

Delivery of Division Officer Navy Leadership Training by Videoteletraining: Initial Concept Test and Evaluation

The feasibility of using videoteletraining (VTT) to deliver Navy leadership (NAVLEAD) training was tested in the Division Officer basic leadership course. Three treatment groups were compared: (1) traditional classrooms; (2) VTT local classrooms with students and an instructor, and (3) VTT remote classrooms where students were connected to the local classroom by a two-way audio and video VTT system. Student responses on questionnaires tended to favor traditional instruction slightly, but differences were small. Subject matter expert ratings of various dimensions of the course were higher for traditional instruction than VTT. Lower student and observer ratings for VTT were on items pertaining to interaction and participation issues. Somewhat less interaction was recorded on a participation tally in VTT classes than in traditional classes. However, a test of knowledge gained in the course revealed no differences among traditional, local, or remote students. This first trial run of NAVLEAD on VTT showed it was possible to deliver the course with some reduction in interaction and participation. The use of VTT for similar relatively short, high throughput courses has led to cost savings associated with travel and instructors. This is the first of two reports, the second evaluated Chief and Leading Petty Officer leadership courses.

NPRDC-TR-95-8
August 1995
(AD-A298 374)

C. Douglas Wetzel
Henry Simpson
George E. Seymour

The Use of Videoteletraining to Deliver Chief and Leading Petty Officer Navy Leadership Training: Evaluation and Summary

The feasibility of using videoteletraining (VTT) to deliver Navy leadership (NAVLEAD) training was tested in Leading Petty Officer (LPO) and Chief Petty Officer (CPO) courses. Three student treatment groups were compared: (1) traditional classrooms; (2) VTT local classrooms with an instructor and students, and (3) VTT remote classrooms where students were connected to the local classroom by a two-way audio and video VTT system. Student responses on questionnaires tended to favor traditional instruction slightly, but differences were not large. Subject matter expert ratings of various aspects of the course were higher for traditional instruction than VTT. Lower student and observer ratings for VTT were generally on topics pertaining to interaction and participation. However, student performance on a simulated activity revealed no significant differences among treatment groups. Results of a class participation tally were analyzed in conjunction with previous results of a Division

Classroom and Afloat Training

Technical Reports

Officer course. Traditional and VTT local classes interacted at similar levels, and VTT remote classes were about two thirds this level. The overall results of both these evaluations are also summarized. These first trials of the courses show it was possible to deliver NAVLEAD on VTT with some reduction in participation and interaction. Regular offerings of the course by VTT might lead to further adaptations to the VTT medium and could yield cost savings associated with travel and instructors.

Classroom and Afloat Training

Technical Notes

NPRDC-TN-95-3
May 1995
(AD-A294 337)

Leonard J. Trejo
Michelle Mullane
Jaimee Stewart

Event-Related Potentials and Electroencephalograms in Adaptive Operator Training: Rationale and Annotated Bibliography

This report presents summaries of research on physiological metrics of learning and memory, task performance, attention, imagery, mental workload, and adaptive training. The focus of the report is on the potential for physiological metrics such as electroencephalograms and event-related potentials to serve as control variables in adaptive operator training. An adaptive training system could use such variables to adapt the frequency and difficulty of training so as to accelerate learning and enhance transfer of training to real-world environments.

This report also describes problems in learning and performance of Navy tasks that call for research on adaptive operator training. Such problems include the complexity of current combat systems, individual differences in learning strategies and ability, and poor transfer of training using conventional training methods. An example of how adaptive training could apply to Navy training is developed for the emitter classification task performed by Navy electronic warfare operators.

NPRDC-TN-95-6
August 1995
(AD-A299 129)

Barbara A. Morris
Janet Dickieson

Design and Development of the Paperless Classroom

The Paperless Classroom project explored the use of advanced technology to design, develop, and demonstrate an interface to large amounts of technical information available in electronic form. Instructional materials and graphics were successfully authored and presented as electronic "books." Hypertext principles allowed for improved data retrieval by the instructor and students. Teaching was enhanced by the ability to display and zoom in on graphics as well as to display the images on student workstations. A new instructional environment was created by networking an instructor workstation with 12 student workstations. A prototype system was field-tested at the AEGIS Training Center, Dahlgren, VA.

The objective of this report is to document the design and development of the Paperless Classroom system.

Classroom and Afloat Training

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NPRDC-TN-95-7

August 1995

(AD-A299 131)

Barbara A. Morris

Evaluation of the Paperless Classroom

The Paperless Classroom project explored the use of advanced technology to develop and demonstrate an interface to the large amounts of technical information available in electronic form. A prototype system was developed and field-tested at the AEGIS Training Center, Dahlgren, VA. Phase I designed and developed an electronic Instructor Guide (IG). Phase II improved the electronic IG and developed an electronic Trainee Guide.

The objective of this effort was to evaluate the effects on teaching and learning when instructors lecture from electronic instructional materials and access visual aids through the use of computer interfaces. Data from observations, surveys, interviews, test scores, and course critiques were collected to obtain information about the use of this technology in the classroom. The Paperless Classroom system was a success; a very useful tool for instructors to access technical information in electronic form as they lecture. The system was reliable and easy to use by both instructors and students. There was no negative impact on learning.

Classroom and Afloat Training

Journal Articles

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Center Support

Administrative Publications

NPRDC-AP-95-1
September 1995

Bibliography of Reports, Journal Articles, Books, and Book Chapters Approved for Public Release: FY94

This report lists all technical reports, technical notes, administrative publications, journal articles, and book chapters that were approved for public release in FY94. Publications in each category are listed in chronological order under the following areas: Workforce Management, Personnel and Organizational Assessment, Classroom and Afloat Training, and Administrative Publications.

NPRDC-AP-95-2
September 1995
(AD-A299 513)

Command History: Calendar Year 1994

This report reflects the Navy Personnel Research and Development Center's 1994 operating philosophy, Commanding Officer and Technical Director biographies, history, organization, center resources, research and development program, Commanding Officer and Technical Director awards, and publications and presentations.

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