DOCUMENT RESUME

ED 105 155 CE 003 423

TITLE	Human Resources Research Organization. Bibliography of Publications and Presentations during FY 1972-74.
INSTITUTION	Human Resources Research Organization, Alexandria, Va.
PUB DATE	Dec 74
NOTE	120p.
EDRS PRICE	MF-$0.76 HC-$5.70 PLUS POSTAGE
DESCRIPTORS	*Abstracts; *Annotated Bibliographies; *Behavioral Science Research; Documentation; Human Resources; *Indexes (Locaters); *Research Reviews (Publications); Technical Reports
IDENTIFIERS	Human Resources Research Organization; HumRRO

ABSTRACT

In addition to the list of HumRRO publications and presentations, of FY 1974, an annotated section incorporates the material from the Bibliography of Publications and Presentations During FY 1972-73. Research reports issued by HumRRO during FY 1974 are listed as are publications by staff members in professional journals and presentations at professional and military meetings. Contracts under which research efforts have been performed are identified. Abstracts are provided for the 1974 items and also for FY 1972 and FY 1973 items which are listed under the research code name (work unit or research project) or under the type of research effort to which they relate. Code names for the research programs are listed alphabetically. If applicable, the listings include identification of the HumRRO division at which the research was performed. Appendixes listing FY 1972-74 technical reports and professional papers by number, an author index, a sponsor index, and a subject index are included. (Author/MW)

Human Resources Research Organization

Bibliography of Publications and Presentations During FY 1972-74

December 1974

HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street
Alexandria, Virginia

Requests for information concerning items in the Bibliography or other aspects of HumRRO work should be addressed to the Office of the President or to the Director of a research Division. The addresses are listed below.

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Published
December 1974
by
HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street
Alexandria, Virginia 22314

FOREWORD

The Human Resources Research Organization is a nonprofit research and development corporation whose purpose is to improve human performance, particularly in organizational settings, through behavioral and social science research, development, and consultation. HumRRO was established in 1951, as part of The George Washington University, from which it separated in 1969.

The chief product of HumRRO work is information; thus, reporting the results of research efforts is a major endeavor. To this end, the *Bibliography of Publications and Presentations During FY 1972-74* has been compiled. It complements the cumulative *Bibliography of Publications as of 30 June 1971*, and replaces the *Bibliography of Publications and Presentations During FY 1972-73*. In combination, these volumes serve as a complete record of information about HumRRO research publications.

HumRRO research and development work focuses on a wide range of training technology, organization psychology, and other human factors problems. HumRRO's research and development is done under research agreements with various departments of the Federal Government, with state and other government agencies, with private industry, and with foundations that are involved in human factors responsibilities.

Meredith P. Crawford
President
Human Resources Research Organization

DESCRIPTION OF THE BIBLIOGRAPHY

Purpose

This Bibliography lists the publications and presentations by the Human Resources Research Organization during FY 1974. In the annotated section, it also incorporates the material from the *Bibliography of Publications and Presentations During FY 1972-73.* It thus provides a complete record for FY 1972-74 for use in conjunction with the cumulative *Bibliography of Publications as of 30 June 1971*, which lists research reports issued since HumRRO's establishment in 1951.

Scope

Research reports issued by HumRRO during FY 1974 are listed in Part I. Also listed are publications by staff members in professional journals and presentations at professional and military meetings. Contracts under which research efforts have been performed are identified.

In Part II, abstracts have been provided for the 1974 items listed in Part I and also for the FY 1972 and FY 1973 items which appeared in the *Bibliography* issued last year.

AD numbers are included on those items that are available to qualified users through the Defense Documentation Center (DDC). PB numbers are included, as appropriate, for items listed in DDC under the Publications Board code. Items deposited in the Educational Resources Information Center (ERIC) are identified by ED numbers. Most of the items are available through the National Technical Information Service (NTIS), U.S. Department of Commerce.

Organization

Items are listed under the research code name (Work Unit or Research Project) or under the type of research effort other than Work Unit or Research Project to which they relate, such as Basic Research. A General section lists items that are not directly related to a specific research project or that are related to several efforts.

Code names for the research programs are listed alphabetically, in each code word group, items are listed chronologically. Within their sections, Exploratory Research and Basic Research efforts are listed sequentially by number, Technical Advisory Service and General publications by date.

If applicable, the listings include identification of the HumRRO Division at which the research was performed.

Appendices listing FY 1972-74 Technical Reports and Professional Papers by number, an author index, a sponsor index, and a subject index are included.

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Part I

List of Publications and Presentations During FY 1974

WORK UNITS AND RESEARCH PROJECTS

ABILITE—Division No. 1 (System Operations)
(Research for the Department of Health, Education, and Welfare, National Institutes of Health, National Library of Medicine Extramural Programs)

A Forecast of Events and Conditions That Might Affect Job and Training Requirements for Medical Librarians, by C. Dennis Fink, Technical Report 73-30, 68 pp., December 1973.

AFTEC—Division No. 7 (Social Science)
(Research for the Department of the Air Force)

"Evaluation Model for Assessing Applicability of Training Techniques in USAF Technical Training," by Edgar M. Haverland, paper for the Fourth Annual "Psychology in the Air Force" Symposium, Air Force Academy, Colorado Springs, Colorado, April 1974.

ASSESS—Division No. 4
(Research for the U.S. Army Research Institute for the Behavioral and Social Sciences)

Development of Leadership Assessment Simulations, by Joseph A. Olmstead, Fred K. Cleary, Larry L. Lackey, and James A. Salter, Technical Report 73-21, 74 pp., September 1973. AD-772 990 ED-080 888

ASSIST—Division No. 2
(Research for the Kentucky Department of Child Welfare)

How to Design Training Systems, by Harold L. Moon, Ronald E. Kraemer, and William C. Osborn, Final Report FR-D2-73-3, 125 pp., June 1973.

ASTARTE—Division No. 1 (System Operations)
(Research for Louisiana Regional Medical Program)

"The Development and Evaluation of a Correspondence Training Program for Tumor Registrars," by C. Dennis Fink and Robert F. Ryan, HumRRO Technical Report in press, based on Final Report to Sponsor, May 1972.

ATC-PERFORM—Western Division (CA)
(Research for the Department of the Army)

Guidelines for the Conduct of Performance Oriented Training, Headquarters United States Training and Doctrine Command, Fort Monroe, Virginia, TRADOC Pamphlet No. 600-11, October 1973, based on "Guidelines for Conducting Performance Training, A Manual for the Conduct of Performance-Oriented Training in Army Training Centers," by Staff of Work Unit ATC-Perform, June 1973.

AUDREAD—Western Division (CA)
(Research for the Department of the Air Force, Human Resources Laboratory)

Auding and Reading. A Developmental Model, by Thomas G. Sticht, Lawrence J. Beck, Robert N. Hauke, Glenn M. Kleiman, and James H. James, AFHRL-TR-74-36, January 1974, (HumRRO Technical Report 74-11, June 1974, 113 pages).

CATB—Division No. 4
(Research for the Department of the Army)

Systems Engineering of Training for Eight Combat Arms MOSs, by Michael R. McCluskey, T.O. Jacobs, and Fred K. Cleary, Technical Report 74-12, 172 pp., June 1974.

Test and Evaluation of Training Extension Course (TEC), by T.O. Jacobs and Richard A. Hardy, Technical Report 74-16, 38 pp., June 1974. AD-784 200

COPE—Division No. 7 (Social Science)
(Research for the Department of the Army)

Development of a Cultural Self-Awareness Approach to Instruction in Intercultural Communication, by Alfred J. Kraemer, Technical Report 73-17, 60 pp., July 1973. AD-765 486

Workshop in Intercultural Communication, by Alfred J. Kraemer, Technical Report 74-13, 84 pp., June 1974. AD-782 196

DAD—Division No. 7 (Social Science)
(Research for the U.S. Air Force, Aerospace Medical Division, Brooks Air Force Base, Texas)

Career Potential Among ROTC Enrollees A Comparison of 1972 and 1973 Survey Results, by Allan H. Fisher, Jr., Richard J. Orend, and Leslie S. Rigg, AFHRL-TR-74-39, OASD(M&RA)MR-74-4, November 1973 (HumRRO Consulting Report CR-D7-73-107, November 1973).

Career Potential of Enrollees in PLC, ROC, and AVROC. A Comparison of Surveys Conducted in May 1972 and May 1973, by Allan H. Fisher, Jr. and Leslie S. Rigg, AFHRL-TR-74-38, OASD(M&RA)MR-74-5, November 1973 (HumRRO Consulting Report CR-D7-73-108, November 1973).

DATA—Division No. 7 (Social Science)
(Research for the Department of Defense, Office of the Assistant Secretary of Defense [Manpower and Reserve Affairs], Directorate for Manpower Research)

Trends in Enlistment Motivation. Results of AFEES Surveys of Enlisted Men from April 1971 to April 1972, by Allan H. Fisher, Jr. and Margi A. Harford, AFHRL-TR-73-68, OASD(M&RA)MR-73 1, June 1973 (revised), (HumRRO Consulting Report CR-D7-73-59, revised September 1973).

Attitudes of Youth Toward Military Service in a Zero-Draft Environment. Results of a National Survey Conducted in November 1972, by Allan H. Fisher, Jr., and Martha R. DiSario, AFHRL-TR-74-37, OASD(M&RA)MR-74-8, May 1974, (HumRRO Consulting Report CR-D7-73-58, June 1973).

A Comparison of Computerized Techniques for Recognizing Spanish Names, by G. Lee Giesecke, Professional Paper 9-73, 20 pp., October 1973. ED-085 146 AD-769 940

DEBRIEF—Division No. 7 (Social Science)
(Research for the Department of the Army)

Military Advising in Vietnam. 1969-1970, by Warren R. Graham and William L. King, Technical Report 73-24, 108 pp., November 1973 (For Official Use Only) (DEBRIEF III). AD-916 [illegible]

A Management Survey of Military Assistance Advisors. Activities and Behaviors, by Warren R. Graham, Technical Report 73-28, 82 pp., December 1973 (For Official Use Only) (DEBRIEF II). AD-916 547

DELTA TWO(CG)—Division No. 7 (Social Science)
(Research for the Department of the Air Force, Human Resources Laboratory)

Findings and Recommendations from the U.S. Coast Guard Survey of Drug and Alcohol Use, by Allan H. Fisher, Jr. and Margi R. Harford, Technical Report 73-15, 190 pp., July 1973.

DETECT—Division No. 4
(Research for the Department of the Army)

Detection of Human Targets, by James A. Caviness and Jeffery L. Maxey, Technical Report 74-4, 41 pp., February 1974. AD-776 381

DOT-IG—Division No. 1 (System Operations)
(Research for the Department of Transportation, National Highway Traffic Safety Administration)

The Development of Guides for Teacher Preparation in Driver Education, by A. James McKnight, Alan G. Hundt, and June S. Cunningham, Final Report FR-D1-71-1, January 1973, DOT-HS-801 131, PB-231 564; issued as Professional Paper 12-74, 32 pp., June 1974.

DRAGCORR—Division No. 4
(Research for the Naval Training Equipment Center)

Performance Correlates of the Dragon Training Equipment and the Dragon Weapon System, by S.R. Stewart, C.I. Christie, and T.O. Jacobs, Final Report FR-D4-74-12, NAVTRAEQUIPCEN N61339-74-C-0056-1, May 1974.

EAGLE—Division No. 4
(Research for the U.S. Coast Guard Headquarters)

The U.S. Coast Guard Academy Curricula. An Evaluation, by Theodore R. Powers, James A. Caviness, T.O. Jacobs, and Jeffery Maxey, Technical Report 74-2, 89 pp., February 1974 (Final Report FR-D4-73-18, November 1973). AD-774 999 ED-088 392

ERC—Division No. 7 (Social Science)
(Research for the Department of Labor, Manpower Administration)

Employment Assistance to Ex-Servicemen With Other Than Honorable Discharge. A Study of the Department of Labor's Exemplary Rehabilitation Certificate Program, Volume I. Report of the Study, Volume II. Verbatim Comments, Data Collection Instruments, and Related Materials, by Thurlow R. Wilson, Robert M. Madsen, and John A. Richards, (HumRRO Final Report) DLMA-92-51-72-151, 144 pp., November 1972, PB-220 314/9 ED-078 154; issued as *Employment Assistance to Ex-Servicemen With Other Than Honorable Discharges. A Study of*

the Department of Labor's Exemplary Rehabilitation Certificate Program, (Report omitting some Appendices), HumRRO Technical Report 74-9, 144 pp., April 1974. PB-234 778

ESPRIT–Division No. 2
(Research for the Department of the Army)

Prediction of Delinquency Among Army Enlisted Men. A Multivariate Analysis, by Wayne B. Shoemaker, Eugene H. Drucker, and Richard E. Kriner, Technical Report 74-3, 30 pp., February 1974. AD-778 787

A Longitudinal Study of Attitude Change and Alienation During Basic Combat Training, by Eugene H. Drucker, Technical Report 74-15, 77 pp., June 1974. (ESPRIT I)

The Effects of Basic Combat Training on the Attitudes of the Soldier, by Eugene H. Drucker, Technical Report 74-17, 76 pp., June 1974.

Changes in Soldier Attitudes, by Eugene H. Drucker, Technical Report in press).

EUFAULA–Division No. 6
(Research for the Alabama Department of Mental Health)

"Staff Training Manual for the EUFAULA Adjustment Center," by Paul W. Caro, John L. Bilbrey, Kathryn U. Paulk, and John Meads, III, September 1973.

The Eufaula Adjustment Center. A Progress Report, by Waters C. Paul (Eufaula Adjustment Center) and Paul W. Caro, a joint report by the State of Alabama, Department of Mental Health and HumRRO, Technical Report 73-29, 30 pp., December 1973. PB-227 245

FLIT–Division No. 3
(Research for the Department of the Army)

"*Research Toward the Design, Development and Evaluation of a Job-Functional Literacy Training Program for the United States Army*," by Thomas G. Sticht, *Literacy Discussion. Journal of the International Institute for Adult Literacy Methods*, vol. 4, September 1973, pp. 339-369.

HumRRO's Literacy Research for the U.S. Army. Developing Functional Literacy Training, by Thomas G. Sticht, John S. Caylor, Lynn C. Fox, Robert N. Hauke, James H. James, Steven S. Snyder, and Richard P. Kern, Professional Paper 13-73, 31 pp., December 1973. AD-776 376

FORGE–Division No. 4
(Research for the Department of the Army)

Components of Organizational Competence. Test of a Conceptual Framework, by Joseph A. Olmstead, Harold E. Christensen, and L.L. Lackey, Technical Report 73-19, 102 pp., August 1973. AD-767 548 ED 080 889

"Leader Performance as Organizational Process. A Study of Organizational Competence," by Joseph A. Olmstead, in *Contingency Approaches to Leadership*, James G. Hunt and Lars L. Larson (eds.), Southern Illinois University Press, June 1974.

GUARDTRAIN—Division No. 2
(Research for the Illinois Department of Corrections Training Academy)

Guard-Train. A Training Curriculum for Illinois Prison Correctional Officers, by Peter B. Wylie and Ronald E. Kraemer, Final Report FR-D2-74-5, June 1974.

IDENTIFY—Division No. 4
(Research for the U.S. Army Mobility Equipment Research and Development Center)

Identification of the Potential Characteristics, Aptitudes, and Acquired Skills Involved in Human Detection of Mines, by Jeffery L. Maxey, Theodore R. Powers, T.O. Jacobs, and George J. Magner, Technical Report 73-18, 49 pp., August 1973. AD-769 780

Investigations of the Human Factors Involved in Mine Detection in Varying Operational Environments, by Jeffery L. Maxey, Theodore R. Powers, T.O. Jacobs, and George J. Magner, HumRRO Technical Report in press.

IMPACT—Division No. 1 (System Operations)
(Research for the Department of the Army)

Project IMPACT Courseware Subsystem. Volume I—Innovative Procedures for Development and Administration, by Michael J. Hillelsohn, Technical Report 74-1, 141 pp., February 1974. AD-776 380

INGROUP—Division No. 4
(Research for the Department of the Army)

Small-Group Instruction, Theory and Practice, by Joseph A. Olmstead, paperback, 129 pp., 1974; based on *Handbook of Small-Group Methods of Instruction*, Research By-Product, RBP-D4-71-27, May 1972 and *Theory and State of the Art of Small-Group Methods of Instruction*, Technical Report 70-3, March 1970, both by Joseph Olmstead.

INTERFACE—Western Division (TX)
(Research for the Department of the Army)

"Effective Low-Cost Simulation," by Elmo E. Miller, paper for Sixth Annual Naval Training Equipment Center and Industry Conference, Man The Focus of the Training System, Orlando, Florida, November 1973; in Proceedings, NAVTRAEQUIPCEN IH-226, pp. 428-440.

JOBGOAL—Division No. 1 (System Operations)
(Research for the Department of the Army)

Methods for Identifying On-the-Job Training Content When Surrogate Jobs Are Used for Training, by Robert C. Trexler and Patrick J. Butler, Technical Report 73-22, 151 pp., October 1973. (JOBGOAL II) AD-769 639

JOBTRAIN—Division No. 1 (System Operations)
(Research for the Department of the Army)

"The Trouble with Troubleshooting," by Richard M. Gebhard, in *TRAINING in Business and Industry*, vol. 10, no. 4, April 1973, pp. 80-81.

MBO–Western Division (TX)
(Research for the Department of the Army)

"Implementation of Motivational Development Training Within Army Battalions," by John P. Fry, paper for the Southwestern Psychological Association meeting, El Paso, Texas, May 1974.

MEDASSESS–Division No. 1
(Research for the National Board of Medical Examiners)

"A State-of-the-Art Review of Techniques and Procedures for the Measurement of Complex Human Performance," by C. Dennis Fink, Harold Wagner, Richard D. Behringer, and Francis L. Hibbits, Consulting Report CR-D1-74-2, February 1974.

MEDIA–Division No. 2
(Research for the Department of the Army)

"The Motion Variable in Procedural Learning," by Ronald W. Spangenberg, *AV Communication Review*, vol. 21, no. 4, Winter 1973, pp. 419-436.

MODE–Division No. 7 (Social Science)
(Research for the Department of the Army)

Drug Usage Rates as Related to Method of Data Acquisition, by George H. Brown, HumRRO Technical Report in press.

MPD II–Division No. 2
(Research for the Louisville, Ky. Division of Police)

"Evaluation of the Louisville Experimental Police District. Second Year of Operations," by William C. Osborn and James H. Harris, Final Report (RP-D2-73-7), October 1973.

NEPTUNE–Division No. 7 (Social Science)
(Research for the Department of the Navy, Office of Naval Research, Psychological Sciences Division)

The Endorsement of Enlistment Incentives, by Allan H. Fisher, Jr. and Leslie S. Rigg, Consulting Report CR-D7-74-131, January 1974. AD-775 916

The Structure of Enlistment Incentives, by Allan H. Fisher, Jr., Richard J. Orend, and Leslie S. Rigg, Technical Report 74-6, 81 pp., March 1974. AD-777 055

NSF-IDM–Division No. 1 (System Operations)
(Research for the National Science Foundation)

Course Modularization Applied The Interface System and Its Implications for Sequence Control and Data Analysis, by E.W. Schneider, Professional Paper 10-73, 17 pp., November 1973, based on a presentation at the April 1972 meeting of the Association for the Development of Instructional Systems (ADIS). PB-227 255 ED-088 424

Research on Instructional Decision Models [by Robert J. Seidel, Richard Rosenblatt, Edward Schneider, Michael Hillelsohn, Judy Compton, and John Stelzer], Final Report FR-D1-73-6, December 1973.

OC LEADER—Division No. 4
(Research for the Department of the Army)

Leadership Instruction for Infantry Officer Candidates. Terminal Training Objectives, by James A. Salter and T.O. Jacobs, Technical Report 73-16, 29 pp., July 1973. AD-769 638

PLAQUE—Division No. 1 (System Operations)
(Research for the Department of Health, Education and Welfare, Bureau of Health Manpower Education)

Development and Evaluation of Self-Applied Plaque Indices for Children, by Harold G. Hunter and C. Dennis Fink, Professional Paper 10-74, 12 pp., June 1974 (CR-D1-73-4, July 1973). PB-234 663

PREVENT—Division No. 2
(Research for the Department of the Army)

A Look at Some Current Drug Abuse Prevention Programs, by Carol L. Seabright, Professional Paper 12-73, 13 pp., December 1973, based on article in *Journal of Drug Education*, vol. 3, no. 2, Summer 1973, pp. 127-140.

PRISM—Division No. 1 (System Operations)
(Research for the Department of the Army)

Individualized Course Completion Time Predictions. Development of Instruments and Techniques, by Harold Wagner, Richard D. Behringer, and Currell L. Pattie, Technical Report 73-25, 39 pp., November 1973. AD-772 992 ED-088 423

Computer Simulation as an Aid to Managers of Training, by Harold Wagner and Patrick J. Butler, Technical Report 73-34, 98 pp., December 1973. ED-088 506

REACTION—Division No. 4
(Research for the U.S. Environmental Protection Agency)

Public Attitudes Toward Hazardous Waste Disposal Facilities, by L.L. Lackey, T.O. Jacobs, and S.R. Stewart, (HumRRO Final Report D4-73-8) EPA-670/2-73-086, 186 pp., June 1973, PB-223 638; issued as HumRRO Technical Report 74-8, 170 pp., April 1974.

RECRUIT—Division No. 7 (Social Science)
(Research for the Department of the Army)

Enlistment Motivation and the Disposition of Army Applicants, by Allan H. Fisher, Jr. and Margi R. Harford, Technical Report 74-5, 72 pp., March 1974. (RECRUIT III) AD-776 973

SAEPP—Division No. 2
(Research for the Illinois Law Enforcement Commission)

"Development of a Systematic Automotive Education Program," by Peter B. Wylie, Donald F. Haggard, Dorothy C. Herbert, James H. Harris, Final Report FR-D2-74-74, June 1974.

SASPI–Division No. 1 (System Operations)
(Research for the U.S. Army Research Institute)

A Systems Analysis of a Self-Paced, Variable-Length Course of Instruction, by C. Dennis Fink, Richard D. Behringer, Harold Wagner, and Morris Showel, Final Report FR-D1-74-3, June 1974; *Annex A: Training, Administrative and Disciplinary Problems Associated With the U.S. Army Clerk-Typist (MOS 71B10/20) Course; Annex B: A Comparison of Graduates, Dropouts, and Instructors of the U.S. Army Clerk-Typist (MOS 71B10/20) Course*, April 1974.

SAWTRAIN–Division No. 4
(Research for the Department of the Army)

The Effects on Training Requirements of the Physical and Performance Characteristics of Weapons, by T.O. Jacobs, Margaret S. Salter, and Chester I. Christie, Technical Report 74-10, 75 pp., June 1974.

SIMRAPP–Division No. 6
(Research for the U.S. Army Training Device Agency)

Army Training Simulator Research, Development and Procurement, FY 1976-1980 Projects and Funding Summaries, by Paul W. Caro, Edward J. Miller, Melvin D. Montemerlo, and Wallace W. Prophet, Final Report, June 1974.

SKYGUARD–Western Division (TX)
(Research for the Department of the Army)

Use of the Job Model Concept to Guide Job Description Procedures for Army Officers, by Paul G. Whitmore, Technical Report 73-26, 36 pp., November 1973. AD-772 993 ED-086 827

SOURCE–Division No. 4
(Research for the Department of Health, Education and Welfare, Social and Rehabilitation Service)

Research Report No. 2. Effects of Agency Work Contexts. An Intensive Field Study, Volume I-Report, Volume II-Technical Appendices, National Study of Social Welfare and Rehabilitation Workers, Work, and Organizational Contexts, (SRS) 74-05416, December 1973 *(Effects of Agency Work Contexts. An Intensive Field Study. Volume I, Agency Structure and Climate*, HumRRO Final Report FR-D4-73-14; *Volume II, Attitudes of Agency Personnel*, HumRRO Final Report FR-D4-73-15, by Joseph A. Olmstead and Harold E. Christensen, October 1973).

Program Application Reports. Study of Agency Work Contexts. National Study of Social Welfare and Rehabilitation Workers, Work, and Organizational Contexts, by Joseph A. Olmstead and Harold E. Christensen, (HumRRO Research Product RBP-D4-73-16), October 1973.

Report No. 1, *Implications for Supervision*, (SRS) 74-05405, December 1973.

Report No. 2, *Implications for Administration*, (SRS) 74-05406, December 1973.

Report No. 3, *Implications for Personnel Management*, (SRS) 74-05407, December 1973.

Report No. 4, *Implications for Training*, (SRS) 74-05408, December 1973.

Report No. 5, *Implications for Organizational Development*, (SRS) 74-05409, December 1973.

SYMDESC—Division No. 1 (System Operations)
(Research for the U.S. Air Force, Human Resources Laboratory)

A Theoretical Basis for Individualized Instruction, by Edward H. Kingsley and John Stelzer, AFHRL-TR-74-10 (HumRRO Technical Report 74-7), 11[illegible]p., April 1974.

SYNTRAIN—Division No. 6
(Research for the Department of the Army)

Research on Synthetic Training. Device Evaluation and Training Program Development, by Paul W. Caro, Robert N. Isley, and Oran B. Jolley, Technical Report 73-20, 49 pp., September 1973. (SYNTRAIN II) AD-768 923

"Variables in Transfer of Training: Devices and Programs," by Paul W. Caro and Wallace W. Prophet, paper for Sixth Annual Naval Training Equipment Center and Industry Conference, Man—The Focus of the Training System, Orlando, Florida, November 1973; in Proceedings, NAVTRAEQUIPCEN IH-226, pp. 265-275.

"Aircraft Simulators and Pilot Training," by Paul W. Caro, *Human Factors*, vol. 15, no. 6, December 1973; issued as Professional Paper 6-74, 9 pp., May 1974.

TRAINMAN- Division No. 2
(Research for the Department of the Army)

"Framework for Performance Testing," by William C. Osborn, *Training in Business and Industry*, vol. 11, no. 5, pp. 28-31, May 1974; based on Professional Paper 3-73.

TYPETRAIN—Division No. 3
(Research for the Department of the Army)

"A Comparison of Alternative Media for Teaching Beginning Typists," by Morris Showel, *Journal of Educational Research*, vol. 67, no. 6, February 1974, pp. 279-285.

UNCLE—Division No. 7 (Social Science)
(Research for the Office of the Assistant Secretary of Defense, Manpower and Reserve Affairs)

"Use of Automated Data Files in Manpower Research," by Eli S. Flyer and Kenneth C. Scheflen, presented at the 25th Military Operations Research Symposium, Monterey, California, November 1973.

UPGRADE—Division No. 6
(Research for the Department of the Army)

UH-1 Helicopter Mechanic (MOS 67N20) Job Description Survey. Background, Training, and General Maintenance Activities, by Russel E. Schulz, Barbara K. FitzGerald, and Wallace W. Prophet, Technical Report 73-33, 198 pp., December 1973. AD-775 390

VETS—Division No. 7 (Social Science)
(Research for the National League of Cities and U.S. Conference of Mayors)

Evaluation of the Veterans' Education and Training Service (VETS) Program of the National League of Cities and U.S. Conference of Mayors, by Kenneth C. Scheflen and Robert J. Brandewie, Technical Report 73-31, 99 pp., December 1973. PB-226 895

Exploratory Research
(Research for the Department of the Army)

Exploratory Research 84—Division No. 6

Retention of Flying Skills and Refresher Training Requirements. Effects of Nonflying and Proficiency Flying, by Robert H. Wright, Technical Report 73-32, 70 pp., December 1973. AD-774 853 ED-089 077

Exploratory Research 91—Western Division (TX)

A Model of the Functions of a Master Instructor, by William H. Melching and Paul G. Whitmore, Technical Report 73-23, 33 pp., October 1973. AD-772 991

Basic Research Studies
(Research for the Department of the Army)

Basic Research 14—Western Division (TX)

"How to Make a Training Film That Really Works," by Elmo Miller, *Training in Business and Industry*, pp. 26-31, January 1974 (based on Technical Report 71-12, *Comparison of Pictorial Techniques for Guiding Performance During Training).*

Basic Research 16—Division No. 5

Research on Stadiometric Ranging. Visually Matching the Apparent Size of Objects, by Robert D. Baldwin, Technical Report 73-27, 22 pp., November 1973. AD-772 994

Technical Advisory Service
(Research for the Department of the Army)

Development and Evaluation of a Pre-School Study Manual for Drill Sergeant Candidates, by William C. Osborn and Ronald E. Kraemer, Professional Paper 5-74, 15 pp., April 1974, AD-780 689; based on Consulting Report CR-D2-71-5, August 1971.

General[1]

"Higher Education and the Challenge of the Seventies," by David S. Bushnell, Professional Paper 9-74, 11 pp., June 1974, based on paper for the Strategies for Change and Knowledge Utilization Conference, Saratoga Springs, New York, July 1972. PB-233 321 ED-092 033

"The Evaluation of Leadership Skills," by T.O. Jacobs, Professional Paper 11-73, 11 pp., December 1973, based on paper for the CONARC Soft Skills Training Conference, Fort Bliss, Texas, December 1972. AD-772 989 ED-087 871

Soft Skills. Definition/Behavioral Model Analysis/Training Procedures, by Paul G. Whitmore and John P. Fry, Professional Paper 3-74, 39 pp., March 1974, based on paper for the CONARC Soft Skills Training Conference, Fort Bliss, Texas, December 1972. AD-778 168

"What are Soft Skills?" by John P. Fry and Paul G. Whitmore, Professional Paper 3-74, 39 pp., March 1974, based on paper for CONARC Soft Skills Training Conference, Fort Bliss, Texas, December 1972. AD-778 168

"Hardware Technology for Computers in Education. One of the Soluble Problems," by Robert J. Seidel, *The Physiologist*, November 1973, vol. 16, no. 4, pp. 610-616, based on paper for the Teaching Session of the American Physiological Society, held in conjunction with the meetings of the Federation of American Societies for Experimental Biology, April 1973; issued as Professional Paper 7-74, 9 pp., May 1974. PB-233 050 ED-093 296

"HumRRO Aviation Psychology Research," by Wallace W. Prophet, paper for the annual convention of the American Psychological Convention, Montreal, Canada, August 1973.

Needed. A Voucher Plan in Support of Continuing Education, by David S. Bushnell, Professional Paper 7-73, 10 pp., August 1973, ED-082 006, also published in *education*, vol. 94, no. 1, September/October 1973, pp. 3-11.

"Content Validation of Training," by Howard H. McFann, paper for the annual convention of the American Psychological Association, Montreal, Canada, August 1973; issued as Professional Paper 8-73, 6 pp., September 1973. PB-224 940

"Process Versus Product Measures in Performance Testing," by William C. Osborn, paper for the Military Testing Association Meeting, San Antonio, Texas, October 1973.

"Presentation for Panel on Early Service Screening," by Robert G. Smith, Jr., paper for the Military Testing Association Meeting, San Antonio, Texas, October 1973.

"Simulation and Aircrew Training and Performance," by Wallace W. Prophet and Paul W. Caro, paper for the Conference on Aircrew Performance in Army Aviation, Fort Rucker, Ala., November 1973; issued as Professional Paper 4-74, 15 pp., April 1974. AD-780 688

"Community College Staff Development. The Future is Now!" by David S. Bushnell and William A. McClelland, paper for the AACJC Assembly, Warrenton, Virginia, December 1973, published in *New Staff for New Students, Report of the 1973 Assembly of the American Association of Community and Junior Colleges*, 1974, pp. 10-22; issued as Professional Paper 2-74, 7 pp., February 1974. PB-231 718

Proceedings of Workshop on Regional Drug Abuse Programming, October 1973, Human Resources Research Organization, Professional Paper 1-74, 14 pp., January 1974. PB-230 383 ED-089 158

[1] Items in this section either are not directly related to specific elements of the research program, or are related to several elements.

"The Priorities and Problems of a Community College President," by David S. Bushnell, paper for the 54th Annual Meeting of the American Association of Community and Junior Colleges, Washington, D.C., February 1974.

"M-16A1 Marksmanship," LTC Jules C. Trepagnier (USA-Ret), *Infantry*, March-April 1974, pp. 53-56.

"Needed. A Functional Literacy Skills Curriculum for the Secondary School," by Thomas G. Sticht, paper for the annual meeting of the American Educational Research Association, Chicago, Illinois, April 1974.

"Community Colleges. What Is Our Job?" by David S. Bushnell and Mary Bach Kievit, *Change*, vol. 6, no. 3, April 1974, pp. 52-53, revised as Professional Paper 11-74, *Will the Real Community College Stand Up!*, 15 pp., June 1974. PB-234 955

"For the Technical Communicator. Pursuing Professional Identity and Maturity," by Eugene A. Cogan, paper for the 21st International Technical Communications Conference, St. Louis, Missouri, May 1974; issued as Professional Paper 8-74, 5 pp., May 1974. PB-233 320

"Small Arms Have a Lot of Punch," by Albert L. Kubala, *Air Defense Trends*, pp. 45-46, June 1974.

An Axiomatic Theory of Subject Matter Structure, by John Stelzer and Edward H. Kingsley, Technical Report 74-14, 72 pp., June 1974. AD-782 193

Developing Questionnaire Items. How To Do It Well, by T.O. Jacobs, paperback, 33 pp., 1974; based on a research program resulting in *A Guide for Developing Questionnaire Items*, by T.O. Jacobs, Research Product, January 1970.

"The Army Officer as Performance Manager," by John P. Fry, HumRRO Professional Paper in press.

Part II

Annotated Bibliography of Publications and Presentations During FY 1972-74

WORK UNITS AND RESEARCH PROJECTS

ABILITE—Division No. 1 (System Operations)
Evaluation of NLM Training Grant Program
(Research for the Department of Health, Education, and Welfare, National Institutes of Health, National Library of Medicine Extramural Programs)

A Forecast of Events and Conditions That Might Affect Job and Training Requirements for Medical Librarians, by C. Dennis Fink, Technical Report 73-30, 68 pp., December 1973.

The purpose of this study was to identify the future developments, events, and conditions in biocommunications and the delivery of health care which could have an impact on the job and training requirements for future medical librarians. The Delphi Method was used to obtain estimates from 15 experts in medical education and biomedical communications, who identified 95 events and conditions that might occur during the next 20 years in biocommunications, health care delivery, and medical education. Prominently mentioned events were. improvements in computer-supported information storage and retrieval systems, or systems for transmitting information, probable changes in the future job duties, training, and manpower requirements of future libraries, development of special librarians and/or information centers, and increased involvement with cooperative efforts.

ACCOUNT—Division No. 1 (System Operations)
Analysis of Army Experience in Implementing a Mechanized Stock Accounting System
(Research for the Department of the Army)

Training in Mechanized Stock Accounting Systems in Army Logistics, by Herbert B. Leedy, Technical Report 72-16, 135 pp., May 1972. AD-744 448 ED-064 619

Army experience with a small mechanized stock accounting system, the NCR 500, was studied with respect to personnel and training, in order to improve implementation of newer and more complex computer-based logistics systems. Officers and enlisted personnel in various duty positions connected with NCR 500 systems in four Far Eastern commands were interviewed. Data showed there had been a continual input of underskilled personnel into nearly all of the duty positions in the mechanized stock accounting system and at its major interfaces. Interviews indicated that efficiency would have been promoted by (a) integrating NCR 500 procedures and concepts with repair parts supply procedures and concepts, (b) a total systems approach to training, (c) upgrading the storage operation as well as the supporting stock accounting system, (d) assigning more well-qualified technical supply officers, and (e) training in the NCR 500 system for more noncommissioned officers with repair parts supply experience.

AFTEC—Division No. 7 (Social Science)
Basic Research Relevant to U.S. Air Force Technical Training
(Research for the Department of the Air Force)

"Evaluation Model for Assessing Applicability of Training Techniques in USAF Technical Training," by Edgar M. Haverland, paper for the Fourth Annual "Psychology in the Air Force" Symposium, Air Force Academy, Colorado Springs, Colorado, April 1974.

A preliminary version of an evaluation model designed to aid in assessing the applicability or "fit" of training approaches or techniques in specific training settings has been developed. It consists of two coordinated series of questions, one concerned with the relevant characteristics of training approaches, and the other with the corresponding characteristics or requirements of training settings. The model is being evaluated by confronting it with the realities of USAF technical training settings.

AIRSCOUT—Division No. 2

Training Requirements and Concepts for Air Cavalry Training
(Research for the Department of the Army)

Aeroscout Pilot and Aeroscout Observer Responses to the Air Cavalry Tactical Information Survey, by William L. Warnick and Warrant Officer Derryl Jones, Research Product RP-D2-72-5, 170 pp., September 1972 (AIRSCOUT I). AD 763 193

A comprehensive survey questionnaire was administered to 14 aeroscout pilots and 15 aeroscout observers who had served in combat with Air Cavalry units. The objectives of the survey were to (a) examine the methods and techniques that have been used by Air Cavalry aeroscout personnel in Vietnam, (b) supplement existing knowledge of Air Cavalry operations, and (c) furnish a basis for training program development for the aeroscout pilot and aeroscout observer. Some major areas covered in the report are. flight skill requirements for Air Cavalry pilots, target detection and recognition, low level scouting techniques, map-reading skills, fire-support adjustment, reconnaissance operations, operating with tactical air, and air mobile operations. Responses indicate a need for a formal training program for the aeroscout pilot and aeroscout observer.

Combat Job Requirements for the Air Cavalry Aeroscout Pilot and Aeroscout Observer, by William L. Warnick, Technical Report 72-37, 68 pp., December 1972 (AIRSCOUT I). AD-755 505

The objectives of this research were to formulate and describe the skills and knowledges required for combat job performance for the aeroscout pilot and aeroscout observer in an Air Cavalry Unit, and to determine how much emphasis should be placed on each skill or knowledge area during training. Job inventory lists were administered to 14 combat-experienced aeroscout pilots and 15 aeroscout observers. The respondents judged each skill or knowledge item in terms of its importance for job performance in combat. This information provides a basis for organizing content and subject emphasis of formal training programs, and provides school personnel and field commanders with a basis for evaluation and development of such.

APSTRAT—Division No. 3

Training Strategies Appropriate to Different Aptitude Levels for Selected Training Courses
(Research for the Department of the Army)

"APSTRAT Action Briefing CONARC," by Howard McFann, Kenneth Weingarten, SFC Robert Anderson, and Paul Crick, briefing for CONARC, Fort Monroe, Va., June 1971.

This briefing was a preliminary report on the test of the APSTRAT instructional model as applied to a Field Wireman Course. Reported findings include improved trainee proficiency, fewer recycles, fewer academic drops, and no difference in achievement among different aptitude levels. Savings of approximately $260 per course graduate were made over the cost of conventional training. Evaluations of the model from the viewpoints of the test course personnel and the proponent agency are also presented.

"Individualized Instruction. A Peer-Instructional Approach," by Kenneth Weingarten, paper for CONARC Training Workshop, Fort Gordon, Ga., October 1971.

This paper discusses the issues of individualized instruction on the basis of HumRRO's experience with the APSTRAT instructional model. The discussion includes the developmental history of Work Unit APSTRAT; the strengths and weaknesses of an alternative media approach to individualization, the development of a peer-instructional model, a description of the operation of the model, the technique of phasing-in the model in an ongoing course, and the importance of rigorous quality control. The paper concludes with an analysis of the relationship of the model to the central concerns of individualized instruction.

APSTRAT *(Cont.)*

Development and Implementation of a Quality-Assured, Peer-Instructional Model, by Kenneth Weingarten, Jacklyn E. Hungerland, and Mark F. Brennan, Technical Report 72-35, 73 pp., November 1972. AD-753 601 ED-070 929

This report describes the development and pilot testing of a low-cost, generalizable, quality-assured, peer-instructional model suitable to the training needs of men of varying measured aptitude. The report presents a brief overview of the project, followed by a detailed description of the APSTRAT model and the considerations that led to its development. The model is discussed in terms of the instructional principles incorporated and the practical constraints accommodated. The data comparing the performance proficiency, academic attrition and recycles, and costs of the conventional and APSTRAT systems indicate that APSTRAT students achieve greater proficiency with a reduction in the rate of academic attrition and a considerable savings in cost.

ASAP—Division No. 1 (System Operations)

Manpower Development Program for Managers of Model Alcohol Safety Projects
(Research for the Department of Transportation, National Highway Safety Board)

The Development of a Training Workshop and Handbook for Directors of Alcohol Safety Action Projects (ASAPs), by A. James McKnight, Bert B. Adams, and Ernest E. Personeus, (HumRRO IR-D1-71-3), Department of Transportation Contract No. DOT-HS-003-1-003, Final Report, September 1971.

This report describes the development of a training workshop and a handbook for Directors of Alcohol Safety Action Projects (ASAPs). The heart of the development activity was an analysis of the Project Director's job tasks using available NHTSA policy and procedures, information gained from directors of existing ASAPs, and a study of project director functions in related areas. From the results of the task analysis a specification of knowledges and skills required of project directors was prepared. This specification served as the basis for preparation of content for a written handbook and a workshop training program for prospective project directors. The handbook is entitled *Handbook for Project Directors, Alcohol Safety Action Projects.* The content of the workshop is described in the *Proceedings of Management Workshop for Alcohol Safety Action Project Leaders* and in the *Instructor's Guide for Management Workshop, Alcohol Safety Action Project.* An ancillary part of the project was the development of a proposal guide entitled *Guidebook for Proposal Development, Alcohol Safety Action Projects.*

ASSESS—Division No. 4

Design and Development of Leadership Scenarios
(Research for the U.S. Army Research Institute for the Behavioral and Social Sciences)

Development of Leadership Assessment Simulations, by Joseph A. Olmstead, Fred K. Cleary, Larry L. Lackey, and James A. Salter, Technical Report 73-21, 74 pp., September 1973. AD-772 990 ED-080 888

This report describes a project to develop leadership assessment simulations to be used in U.S. Army assessment centers. Simulations and associated assessment procedures were developed to assess three levels of military personnel on 11 leadership dimensions. Materials and procedures were also developed for training staff personnel to conduct the simulations and employ the assessment instruments. The report describes the developmental process and the materials that resulted. It was concluded that organizational simulations contribute an aspect to assessment center programs that is not obtainable through other techniques.

ASSIST–Division No. 2

Technical Assistance in Training Development for the Staff Development and Training Unit of the Kentucky Department of Child Welfare
(Research for the Kentucky Department of Child Welfare)

How to Design Training Systems, by Harold L. Moon, Ronald E. Kraemer, and William C. Osborn, Final Report FR-D2-73-3, 125 pp., June 1973.

This report provides a procedural guide for developing personnel training programs. The system within which these procedures were derived was an integration of a training process outline provided by the Kentucky Department of Child Welfare and the systems approach to training models previously developed by HumRRO. The resultant system was implemented during a study designed to ascertain the job requirements and training needs of juvenile service unit workers. The report focuses on training systems analysis, training needs and requirements, training system design, and the purposes and functions of training quality control.

ASTARTE–Division No. 1 (System Operations)

A Training Program for Tumor Registry Secretaries
(Research for Louisiana Regional Medical Program)

"The Development and Evaluation of a Correspondence Training Program for Tumor Registrars," by C. Dennis Fink and Robert F. Ryan, Final Report to Sponsor, May 1972, HumRRO Technical Report in press.

A program designed to teach the medical vocabulary required of tumor registrars was administered to 33 persons, 31 of whom were employed at 25 Louisiana hospitals. The training program was administered as a correspondence course. Some of the major topics include the purposes and products of a tumor registry, the procedures for establishing a tumor registry, general procedures for coding information contained on a tumor registry abstract, the general types of files established and maintained by a tumor registry, and the detailed procedures for abstracting the chart of a cancer patient. The training program was judged to be effective. Criterion test score results showed that on 8 of 10 criterion tests, at least 75% of the students obtained a score of 65 or higher.

ATC-PERFORM

Review, Evaluation, and Refinement of Performance Training in Army Training Centers
(Research for the Department of the Army)

Training Requirements for the Armor Crewman and Reconnaissance Specialist Advanced Individual Training Programs, by G. Gary Boycan and William L. Warnick, Consulting Report CR-D2-72-7, November 1972. AD 759 569

Work Unit ATC-PERFORM was designed to assist the Army in the review, evaluation, and refinement of performance-based training in Basic Combat Training (BCT), Advanced Individual Training (AIT), and Combat Support Training (CST) programs. A combined working group was established to study all MOS-related subjects taught in AIT-Armor and AIT-Reconnaissance programs. This report summarizes the results of the first of three phases of a plan of work being implemented by this group. In this phase, job-related tasks addressed in the AIT programs were examined and tentative proficiency levels established.

Guidelines for the Conduct of Performance Oriented Training, Headquarters United States Training and Doctrine Command, Fort Monroe, Virginia, TRADOC Pamphlet No. 600-11, October 1973, based on "Guidelines for Conducting Performance Training, A Manual for the Conduct of Performance-Oriented Training in Army Training Centers," by Staff of Work Unit ATC-Perform, June 1973.

In performance training, the soldier learns by performing or doing the essential skills and tasks required for him to work successfully in his MOS within his unit. The objective for each subject is that every student be able to perform the required skills to given standards. Training individuals, not groups, is the mission of the instructor in a Training Center. The purpose of this Manual is to provide guidelines for achieving this objective to those people responsible for conducting and monitoring training in basic and MOS-related skills.

ATT-I—Division No. 3

The Development of Diagnostic and Remediation Materials for New-Hire Operators
(Research for the American Telephone and Telegraph Company)

The Development of Diagnostic and Remediation Materials for New-Hire Telephone Operators, by Hilton M. Bialek, Kenneth Weingarten, and Gary Goettelmann, Technical Report 72-24, 49 pp., August 1972. PB 213 137

A Toll Operator's job requires accessing information on routing telephone calls and billing from tables contained in a "Multi-Leaf." To solve training and job performance problems, HumRRO undertook development of a diagnostic and remediation program for use with newly hired operators. The emerging program stressed job-relevant performances, combined individual pacing and task mastery as the criterion for progression to the next training task, and used backward conditioning, In tryout, all 16 operators trained under the new program achieved criterion performance while none of 16 operators trained by conventional means did so. Trial in several telephone companies indicated the program was effective in a field setting and was useful as a quality control-remediation device for experienced operators. It is concluded that the program can serve as a useful training program and also as a prototype for programs on other aspects of the operator's job.

AUDREAD—Western Division (CA)

Auding and Reading: A Developmental Model and Review of Literature Bearing on Hypotheses Derived from the Model
(Research for the Department of the Air Force, Human Resources Laboratory)

Auding and Reading. A Developmental Model, by Thomas G. Sticht, Lawrence J. Beck, Robert N. Hauke, Glenn M. Kleiman, and James H. James, AFHRL TR 74-36, January 1974 (HumRRO Technical Report 74-11, June 1974, 113 pp.).

Four hypotheses consistent with an auding/reading model were derived. (1) the ability to comprehend language by auding will surpass ability to comprehend language by reading during early school years, until reading skill is acquired - following which time the ability to comprehend by auding and reading will become equal, (2) performance on measures of ability to comprehend language by auding will be predictive of performance on measures of ability to comprehend language by reading, after reading skill is acquired, (3) performance on measures of reading rate and auding rate will be comparable, after reading decoding skill has been developed; and (4) training in comprehending by auding will transfer to reading, after reading skill is acquired. It was concluded that reading is based upon, and utilizes the same conceptual base and languaging competencies as used in auding, and that reading skills can be improved through training in languaging using oracy skills.

AUTOSPAN—Division No. 7 (Social Science)

Development and Evaluation of a Self-Instructional Method for Learning a Foreign Language
(Research for the Department of the Army)

"Development and Evaluation of a Self-Instructional Spanish Course," by George H. Brown, paper for XVIIth International Congress of the International Association of Applied Psychology, Liege, Belgium, July 1971; issued as Professional Paper 21-71, 8 pp., October 1971. AD-735 052 ED-057 705

This paper describes the development and evaluation of a self-instructional Spanish course designed to produce an elementary communication skill, sufficient to cope with routine situations. The course has 106 printed lessons and associated tapes. There are two novel pedagogic techniques designed to simulate the experience of using the language in a live conversational situation. simulated tutoring lessons and simulated conversation lessons. Nine military personnel with no prior Spanish training completed the course in an average of 73.7 hours. Average scores on the final examination were. 73%, 85%, and 78%. Results establish the feasibility of building self-instructional foreign language courses to teach useful, elementary, communication skill.

AVCAD–Division No. 1 (System Operations)

Study of Training Improvements

(Research for the Department of Transportation, Federal Aviation Administration)

A Study of Training Program Improvements–Volume I. Findings and Analyses, Volume II. Recommendations for Improvement, by Alan G. Hundt, Robert C. Trexler, and Patrick J. Butler, (HumRRO-FR-D1-72-1), Department of Transportation Contract No. DOT-FA71WA-2687, Final Report, February 1972.

An analysis was made of the Federal Aviation Administration's Air Navigation Facilities Maintenance Training Program. The analysis included. (a) study of the overall training philosophy; (b) comparison of specific instructional activities with the kinds of instructional activities that should be carried on in order to meet the training outcomes required by maintenance concepts, (c) study of the criteria and standards governing the purchase and installation of equipment at the Academy for maintenance training purposes, (d) evaluation of the effectiveness of various teaching methods used to produce the training outcomes required in courses. Documents on the training system were collected and, where documentation was not appropriate for the collection of information, data collection instruments were constructed for the purpose of assessing the adequacy of the instructional system. Conclusions and detailed recommendations pertaining to the improvement of the training program are made.

BUCKEYE–Division No. 3

The Validation of a Set of Occupational Clusters for Use in the Comprehensive Career Educational Model (CCEM)

(Research for The Ohio State University)

An Occupational Clustering System and Curriculum Implications for the Comprehensive Career Education Model, by John E. Taylor, Ernest K. Montague, and Eugene R. Michaels, Technical Report 72-1, 80 pp., January 1972. PB-210 089 ED-061 427

Design of a proposed occupational clustering system for the Comprehensive Career Education Model (CCEM) was to meet three general criteria. encompass most existing jobs, translate into an entire K-12 curriculum, and show clear advantages over other systems. Researchers examined existing clustering systems for relevance and possible adaptation, no one system met all the criteria, so a new clustering system was devised by synthesizing useful features of existing systems. The proposed system has two crucial dimensions one stressing functions and contents of occupations, the other emphasizing status or levels of occupations. The proposed clustering system was planned to fulfill three instructional functions. inform students about the world of work, assist students in choosing a suitable career, and provide models to shape instructional objectives and learning experiences.

BUCKEYE *(Cont.)*

"Occupational Clusters for Career Education," by John E. Taylor, *Career Education. Third Yearbook of the American Vocational Association*, Joel H. Magisos (ed.), American Vocational Association, Washington, D.C., January 1973, Chapter 10, pp. 121-140.

Following a discussion of various occupational clustering systems, this article describes the system synthesized specifically for the Comprehensive Career Education Model. This system consists of two bi-dimensional matrices, each to be integrated, in turn, with ascending K-12 public school grade levels. The first matrix, intended for the lower grades, is structured on an institutional approach, it emphasizes broad complexes, rather than job occupation. The second matrix, aimed at the middle school years, is more closely allied to the occupational approach; it allows for the development of occupations or groups of occupations, clustered along the status dimension. This model for systematizing the world of work provides a basic curriculum framework, in a real-world context, for organizing job-market information, charting trends, and comparing local, regional, and national opportunities.

CAMBCOM—Division No. 4

Knowledges, Skills, and Thought Processes of the Battalion Commander and Primary Staff (Research for the Department of the Army)

Battalion Commander Combat Arms Maneuver Battalion, Identification of Knowledge and Skills and Investigation of Thought Processing, by Arthur J. DeLuca and Theodore R. Powers, Research By-Product RBP-D4-71-26, 1971. AD-731 305 ED-057 343

The knowledge, skills, and thought processing of battalion commanders representing the six types of U.S. Army maneuver battalions were analyzed. A task inventory was developed, using data collected worldwide from battalion commanders, who also ranked leadership objectives in their respective functional areas. Assessments reflect pressures on the commanders at the time they were questioned.

Knowledge, Skills, and Thought Processing of the Battalion Commander and Principal Staff Officers, by Theodore R. Powers and Arthur J. DeLuca, Technical Report 72-20, 33 pp., July 1972. AD-748 832

This report describes research accomplished to aid the U.S. Army Infantry School in its systems engineering of the Infantry Officers Advanced Course curriculum. The research focused on the identification of the knowledge and skills and the study of thought processing of the battalion commander and his four principal staff officers (S1, S2, S3, S4). A survey of these officer activities was conducted in over 80% of all combat maneuver battalions, and data produced by a simulated battalion CPX were analyzed. It was concluded that it is feasible to identify knowledge and skills for commanders and staff officers by conducting a systematic job analysis, to use this information in the systems engineering of a curriculum, and to initially investigate thought processing by using a CPX. However, in the latter case definitive results should be developed by further experimentation.

CATB–Division No. 4

Systems Engineering, Test, and Evaluation of Combat Arms Training
(Research for the Department of the Army)

Systems Engineering of Training for Eight Combat Arms MOSs, by Michael R. McCluskey, T.O. Jacobs, and Fred K. Cleary, Technical Report 74-12, 172 pp., June 1974.

The basic objective of this project was to develop task inventories and job task data for duty positions in eight of the key combat arms MOSs using systems engineering procedures. Field validation by job incumbents, senior NCOs, and officers resulted in a complete definition of each duty position in an MOS in terms of common and noncommon tasks at various levels of organization. The information on commonality of tasks that is contained in this report and the by-product report may be directly utilized by curriculum planners, training administrators, and training developers at each of the combat arms schools. Based on the degree of non-commonality in task performance between various duty positions, the results also include implications for the reorganization or restructure of an MOS.

Test and Evaluation of Training Extension Course (TEC), by T. O. Jacobs and Richard A. Hardy, Technical Report 74-16, 38 pp., June 1974. AD-784 200

Effectiveness of a Training Extension Course (TEC) as a means of increasing the Military Occupational Specialty (MOS) proficiency of Army personnel was evaluated. TEC (using sound/slide as the basic media for 56 lessons) was implemented by the Combat Arms Training Board. Training material for MOS 11B40 (Light Weapons Infantryman) was developed by the U.S. Army Infantry School and distributed to Active Army and National Guard units. MOS Evaluation Test results showed that 11B40 personnel with TEC material available scored significantly higher on Major Area One (Individual Weapons) than 11B40 personnel who did not use TEC materials. Those units (e.g., National Guard units) where TEC use was extensive achieved the greatest increase. Factors influencing the outcome were command emphasis, ongoing training programs, verbal ability, and uneven quality and distribution of certain TEC lessons within a particular test area.

CONVAL–Division No. 3

Evaluation of Community Mental Health Consultation Services to Schools
(Research for the Department of Health, Education, and Welfare, National Institute of Mental Health)

Preliminary Handbook on Procedures for Evaluating Mental Health Indirect Service Programs in Schools, by Ernest K. Montague and Elaine N. Taylor, Technical Report 71-18, 124 pp., August 1971. PB-210 091 ED-080 587

This study was performed to develop methods and instruments for evaluating community mental health center (CMHC) programs of indirect service consultation to schools. Models for three types of consultation are presented–Staff Development–Client-Centered, Staff Development–Agency-Centered, and Project Development. Each model is designed in stages, with purpose, products, approach, and suggested measures for evaluating each stage. For the two Staff Development models, the evaluation instruments presented can, in some instances, be used directly, and in other instances will require adaptation to local circumstances. The instruments consist of questionnaires to determine consultant and consultee expectations for consultation and their final evaluations of outcomes, consultant logs, films of problem children and response guides, and tape record analysis together with instructions for using and analyzing these assessment instruments. An example of Project Development Consultation and its sample associated evaluation instruments are presented in detail.

COPE—Division No. 7 (Social Science)

Development of a Method for Training Military Personnel for Interaction With Foreign Nationals (Research for the Department of the Army)

"A Cultural Self-Awareness Approach to Improving Intercultural Communication Skills," by Alfred J. Kraemer, paper for Annual Meeting of the International Studies Association, New York, March 1973, issued as Professional Paper 5-73, 16 pp., April 1973. AD-760 488 ED-079 213

Communication between persons of differing cultural backgrounds can be hindered by culturally conditioned assumptions they make about each other's cognitions. An exercise was designed to reduce this effect through increased cultural self-awareness. Participants analyze video recordings of staged "excerpts" from intercultural dialogues that contain subtle signs of cultural influences in American society. The participants learn how to recognize such manifestations. The excerpts are grouped into sequences, each sequence shows several manifestations of the same cultural influence, while noncultural influences are varied from excerpt to excerpt.

Development of a Cultural Self-Awareness Approach to Instruction in Intercultural Communication, by Alfred J. Kraemer, Technical Report 73-17, 60 pp., July 1973. AD-765 486

When persons of differing cultural backgrounds attempt to communicate with each other, each makes unwarranted, culturally conditioned assumptions about the other. This makes communication difficult. An exercise was designed to reduce this effect through increased cultural self-awareness. Participants analyze video recordings of staged "excerpts" from intercultural dialogues, containing subtle manifestations of cultural influences present in American society. The participants learn how to recognize such manifestations. To facilitate this difficult process, the excerpts are grouped into sequences, with each sequence showing several manifestations of the same cultural influence while noncultural influences are being varied from excerpt to excerpt. In each sequence, the cultural influence is a common element gradually brought into focus. The script for the 138 excerpts, grouped into 21 sequences, is contained in an appendix.

Workshop in Intercultural Communication, by Alfred J. Kraemer, Technical Report 74-13, 84 pp., June 1974. AD-782 196

The objective of the HumRRO Workshop in Intercultural Communication is to improve the participants' skill in intercultural communication by increasing their ability to recognize cultural influences in their own thinking. This handbook includes detailed instructions for administering the workshop, provides a guide to the scripts of the videotaped dialogues used in the workshop exercise, and describes methods for evaluating the workshop. Data obtained during an initial evaluation are included.

COPY—Division No. 1 (System Operations)

Xerox Corporation Training Systems Analysis: Phase I
(Research for the Xerox Corporation)

"The Xerox Technical Representative. His Training, Support, Work, and Rewards," by Robert C. Trexler, Patrick J. Butler, and Hugo F. Braden, Final Report FR-D1-73-2, 77 pp., March 1973.

This was a systems analysis study designed to detect, expose, and recommend solutions to problems. While the effort concentrated upon the technical representative, it also examined organizational structure, policies and procedures for their impact upon tech-rep performance. Since the tech reps' work is essentially electromechanical maintenance in nature, the study examined not only his actual performance but also characteristics of the structure supporting his work. The report describes the tech reps' work, training, rewards and support, and recommends actions designed to improve them in an integrated and systematic way.

DAD—Division No. 7 (Social Science)

Analysis of Manpower Research Data and Support of Surveys

(Research for the U.S. Air Force, Aerospace Medical Division, Brooks Air Force Base, Texas)

"Career Potential Among ROTC Enrollees. A Comparison of 1972 and 1973 Survey Results," by Allan H. Fisher, Jr., Richard J. Orend, and Leslie S. Rigg, AFHRL-TR-74-39, OASD(M&RA) MR-74-4, November 1973 (HumRRO Consulting Report CR-D7-73-107, November 1973).

Research into the career intentions of Army, Navy, and Air Force ROTC cadets showed that a majority were willing to continue into the advanced program, even without financial aid. The proportion for Army enrollees was much lower than for Navy or Air Force enrollees. Almost half of all advanced cadets were undecided about staying on active duty for more than one tour of duty, with Army enrollees the least likely and Air Force enrollees the most likely to remain. "Military career opportunities" and the chance for "travel, adventure, and new experiences" were the most commonly cited reasons for entering ROTC. Navy cadets also endorsed the "opportunity for further academic education." A majority of Army and Air Force scholarship holders, and less than half the Navy scholarship enrollees, indicated they would have entered ROTC without a scholarship. Over 60% in all services indicated they would have entered ROTC without a subsistence allowance.

Career Potential of Enrollees in PLC, ROC, and AVROC: A Comparison of Surveys Conducted in May 1972 and May 1973, by Allan H. Fisher, Jr. and Leslie S. Rigg, AFHRL-TR-74-38, OASD(M&RA)MR-74-5, November 1973 (HumRRO Consulting Report CR-D7-73-108, November 1973).

Research into the short- and long-range career intentions of PLC, ROC, and AVROC enrollees in 1972 showed that most enrollees intended to stay in their programs. From 30% to 40% indicated they intended to pursue a military career, while about 50% were undecided. Knowledge of financial benefits did not influence career intentions; those planning to leave the service were as likely as the career-oriented personnel to overestimate pay and benefits. Reasons given for entering the program were similar in both years, with "military career opportunities," "travel, adventure, and new experiences," and "service to your country" the most popular reasons.

DATA—Division No. 7 (Social Science)

Research Studies and Analyses of Procurement, Utilization, Performance, Retention, and Separation of Military Personnel

(Research for the Department of Defense, Office of the Assistant Secretary of Defense [Manpower and Reserve Affairs], Directorate for Manpower Research)

"Attitudes of Youth Toward Military Service in a Zero-Draft Environment. Results of a National Survey Conducted in November 1972," by Allan H. Fisher, Jr., and Martha R. DiSario, AFHRL-TR-74-37, OASD(M&RA)MR-74-8, May 1974 (HumRRO Consulting Report CR-D7 73-58, June 1973).

This report analyzes the 1972 results of a continuing DoD national survey aimed at studying the enlistment motivation and attitudes toward military service of American youth. A total of 1,924 male youths, aged 16 to 21 years, were interviewed during a period of low draft calls, reduced troop levels in Vietnam, and increased service pay allowances. Topics covered included their willingness to enlist in the active service under a zero-draft condition, to volunteer for active service as officers, and their views on enlistment incentives, service preference, and career objectives. Results varied according to age and educational status, with high school students showing a higher enlistment potential than college students and males not in school. Fully paid college educations provided the greatest enlistment incentive, especially to the 16 and 17-year olds. Bonus options appealed especially to non-whites. Pay and secure employment were endorsed as the two most important life goals.

DATA *(Cont.)*

Trends in Enlistment Motivation. Results of AFEES Surveys of Enlisted Men from April 1971 to April 1972, by Allan H. Fisher, Jr. and Margi A. Harford, AFHRL-TR-73-68, OASD(M&RA)MR-73-1, June 1973 (revised), (HumRRO Consulting Report CR-D7-73-59, revised September 1973).

The principal objectives of this study were to (a) identify possible trends in enlistment motivation, (b) study recruiting effectiveness, and (c) explore possible reasons or factors underlying the decision of some men to enlist in a Service other than the Service to which they initially applied for enlistment. The most powerful reported influences in enlistment included career development concepts and the opportunity for advanced training and education.

A Comparison of Computerized Techniques for Recognizing Spanish Names, by G. Lee Giesecke, Professional Paper 9-73, 20 pp., October 1973. ED-085 146 AD-769 940

This study was performed to show the validity, or lack of it, of various coding techniques used to identify persons of Spanish derivation. The results of computerized methods to identify Spanish names are compared with responses to questionnaires in which people identified themselves as Spanish. Outside of five southwestern states and at higher educational and aptitude levels, the name recognition procedures include increasing proportions of persons who do not classify themselves as Spanish. This problem is mitigated by using a more restrictive list of Spanish surnames than has been used previously.

DEBRIEF III—Division No. 7 (Social Science)

Research of a System for Debriefing Military Advisors
(Research for the Department of the Army)

Military Advising in Vietnam. 1969-1970, by Warren R. Graham and William L. King, Technical Report 73-24, 108 pp., November 1973 (For Official Use Only) (DEBRIEF III). AD-916 169

A Management Survey of Military Assistance Advisors. Activities and Behaviors, by Warren R. Graham, Technical Report 73-28, 82 pp., December 1973 (For Official Use Only) (DEBRIEF II). AD-916 547

DELTA—Division No. 7 (Social Science)

DoD Non-Therapeutic Drug Usage Survey and Results
(Research for Advanced Research Projects Agency)

Preliminary Findings from the 1971 DoD Survey of Drug Use, by Allan H. Fisher, Jr., Technical Report 72-8, 70 pp., March 1972. AD-743 852

This report, Phase I of a project to study use of nontherapeutic drugs in the Armed Services, identifies demographic correlates of drug abuse. A stratified sample of 36,510 enlisted men, representative of the four Armed Services worldwide, answered a 73-item Survey of Drug Use. Reported use of drugs (Sep 70-Sep 71) was highest for Army personnel, who also reported the highest daily drug usage rates. Except for the Army, daily usage rates for drugs were less than 2%. Major correlates of daily narcotic use included age, rank, race, and military service. Nontherapeutic drug use is mainly reported by younger enlisted men, in the lower pay grades. Higher rates of drug use are reported by non-whites. Use of drugs as a civilian is positively related to drug use in the Service. Findings on drug acquisition, availability, sources of supply, and recognition of drug problems by admitted users are reported.

Analyses of Selected Drug-Related Topics. Findings From Interviews at Four Armed Service Locations, by Allan H. Fisher, Jr., Technical Report 72-9, 77 pp., March 1972. AD-743 853 ED-064 637

This report, Phase II of a project to study reasons for drug use, summarizes information on military job performance effects of drug use, and attitudes toward and knowledge of drug treatment and rehabilitation among servicemen. Major reasons given for the initial use of marijuana in the military were curiosity and enjoyment. Career and non-career enlisted men differed in attitudes toward drug use and drug abuse control. Awareness of local drug rehabilitation facilities was low; awareness of DoD and VA programs was higher.

DELTA TWO (CG)–Division No. 7 (Social Science)
Replication of the DoD Survey of Drug Use
(Research for the Department of the Air Force, Human Resources Laboratory)

Findings and Recommendations from the U.S. Coast Guard Survey of Drug and Alcohol Use, by Allan H. Fisher, Jr. and Margi R. Harford, Technical Report 73-15, 190 pp. July 1973.

This report is on Phase I of a two-phase research project to study the extent of drug and alcohol use in the Armed Services and Coast Guard. Results are presented for a stratified random sample of 4,801 Coast Guard enlisted men who responded to a 105-item survey of drug and alcohol use. The majority were neutral about, or in favor of, the use of soft drugs and alcohol. Almost 40% reported drug use in the last year. Although 12% reported frequent soft drug use, less than 1% reported frequent use of hard drugs. Over 90% reported alcohol use, with 8% classified as heavy drinkers. Younger men in lower pay grades reported more heavy drinking and drug use. Present educational attempts to control drug and alcohol abuse show some positive impact, although skepticism toward military treatment programs was noted. Recommendations and implications for drug and alcohol abuse control were derived from this study.

DETECT–Division No. 4
Detection of Human Targets by the Infantryman in the Field Situation
(Research for the Department of the Army)

Detection of Human Targets, by James A. Caviness and Jeffery L. Maxey, Technical Report 74-4, 41 pp., February 1974. AD-776 381

A study of detection performance by infantrymen for human targets under optimal lighting and line-of-sight conditions was conducted to obtain data for the Army Small Arms Requirements Study (ASARS). Four classes of variables were studied. target, environmental, organismic, and experiential. Results indicated that illumination intensity, target lighting, target size, target speed, target contrast with environment, terrain, observer height, observer movement, and observer experience are important determinants of detection. Results demonstrated a need to further examine the interactions among these determinants when some or all of them are varied at one time.

DOLPHIN–Division No. 1 (System Operations)
Impact of Restructured Maintenance Process on ULMS Maintenance Personnel Factors
(Research for the Department of the Navy, Strategic Systems Projects Office)

A Plan for ULMS Weapon System Maintenance and Its Personnel Implications, by Robert C. Trexler and Paul E. Loustaunau, Technical Report 72-36, 58 pp., November 1972, based on Final Report, January 1971. AD-753 816

This report describes research performed to develop a plan for the maintenance process applicable to the Undersea Long Range Missile System (ULMS). The plan developed forestalls possible stresses in the acquisition, training, and utilization of maintenance personnel. Interviews were conducted with U.S. Naval Strategic Systems Projects Office (SSPO) personnel, weapon system contractors, and others in related service and civilian organizations and activities. Areas were found where effort can be placed in ULMS planning that should result in ameliorating stresses found in the earlier POLARIS/POSEIDON personnel system. These areas are: hardware, technical documentation, training and career development.

DOT-DE—Division No. 1 (System Operations)
Development of Driver Education Objectives: A Driving Task Analysis
(Research for the Department of Transportation, National Highway Traffic Safety Administration)

"Needed—Goals for Driver Education," by A. James McKnight, *Concepts*, vol. 4, no. 2, Spring—Summer 1971.

"The Development of Instructional Objectives for Driver Education Through Analysis of the Driver's Tasks," by A. James McKnight, paper for Symposium at Institute for Road Safety Research SWOV, Noordwijkerhout, The Netherlands, August 1971.

This paper describes a set of instructional objectives that may be used by driver educators to develop and evaluate their courses. The objectives were derived from a comprehensive and detailed analysis of the driver's tasks and an evaluation of their criticality to the safety and effectiveness of the highway transportation system. A knowledge and performance test was developed to assist driver educators in assessing the degree to which instructional objectives have been attained.

Driver Education Task Analysis Task Analysis Methods, by A. James McKnight and Bert B. Adams, (DOT HS 800 368) Technical Report 72-13, 45 pp., April 1972. PB-197 688 ED-075 624

This report describes a method used to analyze and evaluate the criticality of driver behaviors. To assure comprehensive identification of driving behaviors, an analysis was made of the total highway transportation system including the driver, vehicle, roadway, traffic, and natural environment. Each aspect of the system was examined to identify specific situations that drivers encounter and the appropriate responses. The behaviors arising out of the systems analysis were organized into groups of related behaviors or "tasks." The analysis was continued to assure the identification of specific driving responses and associated cues. A group of 100 traffic safety experts, selected from among driver educators, enforcement officers, license officials, and fleet safety personnel, were asked to evaluate the criticality of the 1700 identified behaviors to the safety and efficiency of the highway transportation system. The driving behaviors, together with their associated criticality indices and various items of supporting information gained through a survey of the driving literature, were entered into a set of driving task descriptions.

Driver Education Task Analysis. The Development of Instructional Objectives, by A. James McKnight and Alan G. Hundt, (DOT HS 800 370) Technical Report 72-14, 69 pp., April 1972. PB-202 248 ED-075 623

This report describes the methods that were used to develop for driver education courses a set of instructional objectives, as well as an evaluation tool to measure their attainment. Both of these tools were based upon the results of a driving task analysis conducted in earlier research. Those driving behaviors considered so critical as to be required of all drivers were organized into a set of performance objectives and accompanying performance standards. A set of enabling objectives, describing the skills and knowledges required in carrying out performance objectives, was also prepared. The evaluation comprises three tests. (1) a Driving Fundamentals Test, an off-road test to measure basic skills involved in controlling motion of the vehicle, (2) a Driving Situations Test, a checklist of student responses to planned and unplanned real-world driving situations, and (3) a Driving Knowledge Test, 105 information items drawn from enabling objectives. Pilot testing at a high school established their feasibility of administration. Recommendations for additional development of the Driving Situations Test are given.

DOTHAN I—Division No. 6 (Aviation)

Provision of Consulting Services to the Dothan City Schools
(Research for the Dothan, Alabama, City Schools)

"The Occurrence of Inappropriate Classroom Behavior Among Elementary School Students," by H. Alton Boyd, L. Paul Dufilho, Wallace W. Prophet, and Paul W. Caro, Final Report, July 1972.

This research studied the effects of a special in-service training program for elementary school teachers on student performance and behavior. The program was aimed at helping teachers deal with students who suffer socioemotional conflict problems. Results showed a significant decrease in inappropriate classroom behavior among students of teachers who received the special training, compared with students whose teachers did not receive the training.

DOT-IG—Division No. 1 (System Operations)

Development of Course Guides for Teacher and Instructor Preparation in Driver Education
(Research for the Department of Transportation National Highway Traffic Safety Administration)

Guide for Teacher Preparation in Driver Education. Secondary School Edition, [by A. James McKnight, Alan G. Hundt, June S. Cunningham, and Jerome P. Corbino], research product prepared under Contract FH 11-7602, November 1971. (GPO TD8.8:D83/10)

This Guide provides driver education instructors with information and procedures that will enable them to develop programs specifically for their students. The Guide (a) discusses the characteristics of the highway transportation system, its relationship to accident causation, and the programs that exist to improve the effectiveness of the system, (b) deals with the components of the driver education system, and (c) offers a guide for instruction in some 70 driving tasks. Suggested instructional aids and resource materials are also included.

The Development of Guides for Teacher Preparation in Driver Education, by A. James McKnight, Alan G. Hundt, and June S. Cunningham, DOT-HS-801 131, (HumRRO Final Report FR-D1-71-1, January 1973) PB-231 564; issued as Professional Paper 12-74, 32 pp., June 1974.

Two separate guides were developed, one for secondary school driver education teachers and the other for commercial driving school instructors. The development of both guides involved a four-step process. (a) an analysis of both the highway transportation system and the instructional system, public and private, to identify instructional requirements imposed upon the driver education teacher, (b) the performances, skills, and knowledges required of the driver educator in meeting his instructional requirements, (c) the preparation and assembly of materials needed to fulfill the instructional objectives, and (d) a large-scale review of the guides by representatives of the secondary school and commercial driving school communities.

DOT-MC—Division No. 1 (System Operations)

Curriculum for Secondary School Driver and Traffic Safety Education
(Research for the Department of Transportation, National Highway Traffic Safety Administration)

"The Application of Systems/Task Analysis to the Identification of Driver Perception and Decision-Making Processes," by A. James McKnight, paper for Symposium, Organization for Economic Cooperation and Development, Rome, Italy, November 1972.

The traditional systems- and driver-oriented concepts of driver training have fallen short of allowing any significant control over the driving process. Accordingly, the systems/task analysis process was used to analyze the U.S. highway transportation system and to identify the driver's tasks. Over 1,700 specific behavioral requirements imposed upon the driver were identified. Analysis of these data indicates that safe driving results more from the driver's perceptual habits and his ability to identify potentially hazardous situations, than from his decision-making or motor processes. In fact, the author questions just how much decision-making as such is actually involved in driving.

DRAGCORR—Division No. 4

Identification of the Knowledges, Skills, and Abilities Necessary to Maximize Performance on the Dragon Weapon System
(Research for the Naval Training Equipment Center)

Performance Correlates of the Dragon Training Equipment and the Dragon Weapon System, by S.R. Stewart, C.I. Christie, and T.O. Jacobs, Final Report FR-D4-74-12, NAVTRAEQUIPCEN N61339-74-C-0056-1, May 1974.

The purposes of this study were to (a) develop a selection program for Dragon gunner trainees, (b) identify the critical knowledges, skills, and abilities needed for optimal performance with Dragon, and (c) determine the discrepancies between those factors required to effectively employ the Dragon and its training equipment. The subjects were 225 enlisted men participating in a test of the Dragon training equipment. Stepwise multiple regression analyses were performed using training and live missile performance measures as two separate criteria. Videotapes were made of live missile firings and post-live-fire interviews were conducted with gunners. It was not possible to predict success with the actual weapon system. All investigated parameters of performance during training failed to correlate significantly with performance on Dragon. Discrete random errors accounted for misses. It was found that the selection program developed should not be used for general screening purposes. The current training devices failed to meet at least some of the requirements identified. However, a combination of these devices with modifications was judged suitable for use as interim training equipment.

EAGLE—Division No. 4

Study to Evaluate and Recommend Changes to the Curricula at the U.S. Coast Guard Academy
(Research for the U.S. Coast Guard Headquarters)

The U.S. Coast Guard Academy Curricula. An Evaluation, by Theodore R. Powers, James A. Caviness, T.O. Jacobs, and Jeffery Maxey, Technical Report 74-2, 89 pp., February 1974 (Final Report FR-D4-73-18, November 1973). AD-774 999 ED-088 392

This report presents the results of research that had as its objective the evaluation of the curricula of the U.S. Coast Guard Academy. Over 125 Coast Guard officers and men were interviewed, to gather detailed background information about the Coast Guard, the Coast Guard Academy, and job requirements of Academy graduates. These data were developed into a Job-Task Inventory Questionnaire (JTIQ) which was administered to Academy graduates, and yielded information as to the critical tasks required of officers during their early years of Coast Guard service. The JTIQ responses and two CG-developed documents ("A Study to Determine the Future Commissioned Officer Requirements of the CG-1972-1982" and the "Long Range View" paper) were analyzed and, through standard systems analytic procedures, recommendations for changes to the Academy curricula were developed.

Educational Workshops—Division No. 5
(Research for the River Rouge, Michigan, School District)

Inservice Training for a New Function for School Psychologists," by Edward W. Frederickson, William H. Melching, and Paul G. Whitmore, Professional Paper 15-72, 7 pp., July 1972, based on paper for Southwestern Psychological Association, San Antonio, Tex., May 1971. PB-212 874

Interest in the role of the school psychologist evolved as a result of a series of teacher inservice workshops developed and conducted by a HumRRO team in a school district in Michigan. Poor academic performance, student behavior, discipline, and low student motivation were the main problems under review. The approach in the workshops was based on the belief that the most effective solution to these problems would be through corrective changes in classroom practices of teachers, ultimate changes that are desired are in the behavior of the students, but they have to be approached through change in the behavior of the teachers. The workshops focused on contingency management, instructional objectives, and mastery modules. A primary concern of the workshop team was that, to be effective, this program had to be followed on throughout the year so that a long-term view of its success could be realized.

The Process of Individualizing Instruction, by Paul G. Whitmore, William H. Melching, and Edward W. Frederickson, Professional Paper 8-72, 10 pp., April 1972. AD-743 156

This paper describes a series of summer workshops for in-service teacher training (Kindergarten, Grades 1, 2, and 3) in the application of techniques and procedures based on pupil mastery of individualized modules of instruction. Contingency reinforcement management methods were demonstrated and practiced in the attempt to change pupil behavioral responses. It is noted that a change to individualized instruction must begin with changes in teacher classroom management skills rather than changes in students, architecture, or materials.

Gain in Student Achievement as a Function of Inservice Teacher Training in Classroom Management Techniques, by Paul G. Whitmore, William H. Melching, and Edward W. Frederickson, Technical Report 72-26, 48 pp. October 1972. PB-213 074

This report evaluates the effects of special inservice training of a group of elementary teachers. The training program a series of workshops plus immediate follow-on efforts—sought to increase achievement in students by changing instructional practices used by the teachers. For grades 2-7, students of program teachers gained almost twice as much on a standardized achievement test as did students of non-program teachers, differences in mean gain scores in reading and mathematics were both highly significant. For grades K-1, students of program teachers tended to have higher gain scores than students taught by non-program teachers, but the differences were small. No single factor appears to account for the enhanced student gains produced by program teachers. These gains were apparently due to the integration of workshop training, trial implementation, classroom observation, availability of teacher aides, and frequent guidance and assistance provided to teachers.

ENDURE—Division No. 2
Tank Crew Performance During Periods of Extended Combat
(Research for the Department of the Army)

The Effects of a 48-Hour Period of Sustained Field Activity on Tank Crew Performance, by L.L. Ainsworth and H.P. Bishop, Technical Report 71-16, 109 pp., July 1971. AD-731 219 ED-055 257

A 48-hour field experiment was conducted to determine the effects of sustained activity on the performance of tank crews in communication, driving, surveillance, gunnery, and maintenance activities. Only moving surveillance and some driving activities showed statistically significant performance deterioration over a 48-hour period of work without sleep, but these decrements were not considered to be of practical significance. The experiment showed that the diurnal rhythm of the subjects did not affect performance significantly. The research indicates that changes in unit organization or tactical doctrine are not necessary to accomplish continuous operations. The results of the experiment support the broad conclusion that tank crews using present equipment can maintain operational proficiency during 48 hours of sustained activity.

ENDURE *(Cont.)*

"Effects of 48 Hours of Sustained Field Activity on Tank Crew Performance," by L.L. Ainsworth and H.P. Bishop, paper for American Psychological Association Convention, Honolulu, Hawaii, September 1972.

A field experiment was conducted to determine effects on tank-crew performance in communication, driving, surveillance, gunnery, and maintenance tasks, of sustained activity for 48 hours without sleep. Only moving surveillance and certain driving performances showed statistically significant performance decrements, and these were not of practical significance. Diurnal rhythm of the subjects did not affect performance significantly. The study indicated that continuous 48-hour operations can be accomplished without changes in unit organization or tactical doctrine, and supported the general conclusion that tank crews can maintain operational proficiency during 48 hours of sustained activity using presently existing equipment.

ERC—Division No. 7 (Social Science)
(Research for the Department of Labor, Manpower Administration)

Employment Assistance to Ex-Servicemen With Other Than Honorable Discharges. A Study of the Department of Labor's Exemplary Rehabilitation Certificate Program, Volume I. Report of the Study, Volume II. Verbatim Comments, Data Collection Instruments, and Related Materials, by Thurlow R Wilson, Robert M. Madsen, and John A. Richards, (HumRRO Final Report) DLMA-92-51-72-151. 144 pp., November 1972, PB-220 314/9 ED-078 154, issued as *Employment Assistance to Ex-Servicemen With Other Than Honorable Discharges. A Study of the Department of Labor's Exemplary Rehabilitation Certificate Program*, (Report without some appendices), HumRRO Technical Report 74-9, 114 pp., April 1974. PB-234 778

Public Law 89-690 (1966) specifies that ex-servicemen with other than honorable discharges may document post-service good conduct and obtain an Exemplary Rehabilitation Certificate entitling them to special job help at public employment offices. The employment benefits of the Department of Labor's ERC program were studied. All 700 ERC holders and a sample of those who inquired about the ERC, but did not apply, were surveyed by mail. A few interviews were conducted with employers, program administrators, employment service personnel, men recently discharged with a general or other than honorable discharge, and representatives of organizations assisting veterans. The conclusions were that ERC holders have obtained few benefits in seeking and retaining employment. The ERC apparently brings no special job counseling, and holders are frequently reluctant to show it to employers. The program is generally unknown to employers and to employment service personnel. Applying for an ERC can subject the ex-serviceman to embarrassment, and may even damage his reputation in his community. Ex-servicemen often misinterpret the objective of the ERC and apply hoping that it will assist in discharge change rather than for job aid. Only 11% of ERC holders reported that the certificate has helped them to get a job.

ESPRIT—Division No. 2

Development of Methods for Improving Soldier Adjustment to the Army
(Research for the Department of the Army)

Reenlistment Intentions of Tank Commanders, by Eugene H. Drucker and Shepard Schwartz, Technical Report 72-17, 43 pp., May 1972. AD-743 854

A battery of tests was administered to 100 tank commanders in Grade E6, to determine factors involved in reenlistment decisions. Tests included a background information questionnaire, an attitude questionnaire, five personality scales, and measures of present and expected future need satisfaction. Subjects were divided into three groups according to their responses to a question dealing with their reenlistment intentions, to reenlist, not to reenlist, and undecided. The results indicate that expected incentive increases were important factors in the reenlistment decision, particularly expected increases in satisfaction of esteem needs and self-actualization needs. While there were significant differences between the groups in attitude toward the Army, it was impossible to determine from the data whether attitude was a cause of the reenlistment decision or a consequence of it. Of the personality scales, only the Socialization scale showed a relationship to reenlistment. Family life appeared to be an important factor in the reenlistment decision.

The Prediction of AWOL, Military Skills, and Leadership Potential, by Eugene H. Drucker and Shepard Schwartz, Technical Report 73-1, 43 pp., January 1973. AD-758 161 ED-074 342

During basic combat training, 2,072 enlisted men were classified as being either AWOL or Non-AWOL. Three hundred of these men were similarly classified after 90 days in their initial unit assignment. AWOL and Non-AWOL soldiers were then compared to determine whether certain factors could be used to predict which soldiers would go AWOL, or could predict ratings of acquired military skills and of leadership potential. The results indicate that AWOL and Non-AWOL subjects differed on personality, education, intelligence, aptitude, and military component. No differences were found in attitude toward the Army, race, or physical status. AWOL and Non-AWOL subjects differed in age during initial unit assignment, but only among 17- and 18-year-old soldiers during basic combat training. Only 19-year-old and older subjects differed in career orientation. In general, the same factors that were related to AWOL were related also to military skill and leadership potential.

Prediction of Delinquency Among Army Enlisted Men. A Multivariate Analysis, by Wayne B. Shoemaker, Eugene H. Drucker, and Richard E. Kriner, Technical Report 74-3, 30 pp., February 1974. AD-778 787

AWOL and delinquency information was obtained for 1,199 enlisted men during basic combat training and for 316 of these men after eight months in military service. Soldiers were classified as AWOL, delinquent (including AWOL), or nondelinquent. Stepwise discriminant function analyses were performed to determine how well delinquency scales and background information differentiate between AWOL and nondelinquent personnel and between delinquent and nondelinquent personnel during basic combat training and after eight months in service. The results indicate that during basic combat training, 18% of the AWOL soldiers and 17% of the delinquent soldiers could be identified. After eight months in service, 35% of the AWOLs and 20% of the delinquents could be identified. Compared to prior attempts to predict delinquency and AWOL, there were relatively few nondelinquents falsely classified as AWOL or delinquent. In general, demographic information was more useful than delinquency scales in predicting AWOL and delinquency.

ESPRIT *(Cont.)*

A Longitudinal Study of Attitude Change and Alienation During Basic Combat Training, by Eugene H. Drucker, Technical Report 74-15, 77 pp., June 1974. AD-782 192

A questionnaire containing attitude and alienation items and background information was administered to 974 enlisted men at Fort Knox during the week prior to beginning basic training (March 1970) and during their final week of basic training (May 1970). Results indicated: attitudes were relatively stable during basic training, morale seemed to improve during training, soldiers were satisfied with military leadership, the men recognized the importance of their service and cared how well they performed as soldiers, soldiers wanted to maintain many military traditions, but were concerned that their constitutional rights not be violated. Decreases in alienation were obtained on three of the six alienation scales, there was an increase on one scale. In general, the more alienated subjects were older, better educated, and had higher family incomes than the less alienated soldiers. White soldiers were more alienated than Black soldiers, and draftees were more alienated than soldiers who enlisted. There was a trend for the highly alienated soldiers to become less alienated by the end of basic training.

The Effects of Basic Combat Training on the Attitudes of the Soldier, by Eugene H. Drucker, Technical Report 74-17, 76 pp., June 1974.

A questionnaire was administered to 291 soldiers in April 1971, before the start of their basic training in order to identify the attitudes and reactions that the soldiers had, or expected to have during basic training. A second questionnaire was administered to 521 soldiers during their final week in basic training to determine the actual attitudes and reactions of soldiers after receiving basic combat training. The second questionnaire was also administered to 90 NCOs, assigned as cadre, to assess their perceptions of trainee attitudes and reactions. The results indicate that (a) many new soldiers expected to have negative attitudes toward the Army during basic training, (b) the transition from civilian to military life was not as difficult as anticipated, according to the reports received at the end of training, and (c) NCOs tended to perceive the attitudes and reactions of trainees to be more favorable than they really were.

Changes in Soldier Attitudes, by Eugene H. Drucker, HumRRO Technical Report in press.

As part of a study of methods for increasing motivation and preventing attitude deterioration of the enlisted man, responses to specific items in a 1970 HumRRO attitude survey conducted at Fort Knox were compared with responses to the same items in several surveys conducted by the U.S. Army Troop Attitude Research Branch during and immediately following World War II. Caution must be exercised in making such comparisons since responses to attitude items can be affected by many factors, including sample composition, outdated phrasing, willingness to respond candidly, influences from other items, administrative procedures, unit or post differences, and likelihood of combat participation. Results of the response comparison suggested several areas of possible similarities and differences in soldier attitudes over the 20 to 25 year period, they also showed how historical comparisons can affect the interpretation of responses to these items. A review of the literature dealing with the process of attitude change gave special attention to the dissonance and functional theories of attitude change for possible implication with reference to changing soldier attitudes.

EUFAULA–Division No. 6

A Staff Development Plan for the Eufaula Adjustment Center, Alabama Department of Mental Health

(Research for the Alabama Department of Mental Health)

"Staff Training Manual for the EUFAULA Adjustment Center," by Paul W. Caro, John L. Bilbrey, Kathryn U. Paulk, and John Meads, III, September 1973.

This training manual provides documentation of the staff training programs in use at the termination of the HumRRO training program development efforts in September 1973. All resources necessary for the administration of the training programs are described. The manual contains two training programs, a program for the Primary Treatment Staff and a program for the Supportive Treatment Staff.

The Eufaula Adjustment Center. A Progress Report, by Waters C. Paul (Eufaula Adjustment Center) and Paul W. Caro, a joint report by the State of Alabama, Department of Mental Health and HumRRO, Technical Report 73-29, 30 pp., December 1973. PB-227 245

The first year of operation of the Eufaula Adjustment Center, a residential facility of the Alabama Department of Mental Health, is described and evaluated in this report. The Center's approach is based on the concept that certain mental illnesses are the result of having learned inadequate or inappropriate coping skills and behavior rather than of disease. The staff, largely nonprofessionals previously inexperienced in the field of mental health care, are selected and trained by the Center to help residents unlearn negative responses and learn more socially and personally supportive behavior. The residents, primarily young adults, progress at their own rate through individualized programs featuring courses in vocational and personal development, individually prescribed instruction (IPI), physical education, and recreational activities. The Center operates a token economy system with reinforcement for positive behavior. The Department of Mental Health was assisted in the development of training and treatment programs by the Human Resources Research Organization.

FLIT–Division No. 3

Development of a Prototype Job-Functional Army Literacy Training Program

(Research for the Department of the Army)

"Research Toward the Design, Development and Evaluation of a Job-Functional Literacy Training Program for the United States Army," by Thomas G. Sticht, *Literacy Discussion. Journal of the International Institute for Adult Literacy Methods*, vol. 4, September 1973, pp. 339-369.

Literacy skill requirements of Army jobs were determined using three approaches. (a) a special formula for estimating the reading grade level of difficulty of technical manuals used by men in Army jobs (b) relationships between a man's reading ability and his performance on job reading task tests, and (c) relationships between a man's reading ability and his job proficiency measured by job knowledge tests and job sample tests. Project FLIT and other literacy training programs are discussed. FLIT's objective has been to develop a literacy training program designed to provide a level of functional literacy appropriate to present minimal job reading requirements, and requiring no more than six weeks of training time.

HumRRO's Literacy Research for the U.S. Army. Developing Functional Literacy Training, by Thomas G. Sticht, John S. Caylor, Lynn C. Fox, Robert N. Hauke, James H. James, Steven S. Snyder, and Richard P. Kern, Professional Paper 13-73 (updated version of Professional Paper 2-73), 31 pp., December 1973. AD-776 376

This paper summarizes literacy research and development performed by HumRRO for the Army since 1968. Literacy needs for several basic Army Military Occupational Specialties (MOSs) were identified and methodology was developed to evaluate reading requirements for Army jobs. Under the current effort, an experimental training program is being designed to produce a level of functional literacy appropriate to minimal MOS requirements.

FOLLOWTHRU–Division No. 3

Characteristics of Men Tested in Work Unit UTILITY Who Remain in the Army
(Research for the Department of the Army)

Role of Selection and Growth in Performance of Experienced Men. Some Evidence From a Study of Four Army Jobs, by Elaine N. Taylor and Robert Vineberg, Technical Report 73-4, 24 pp., February 1973. AD-758 871

Use of data from an earlier study (UTILITY) provided information on the roles of growth and selection in the relatively better job performance by experienced men in four Army jobs (Armor Crewmen, General Vehicle Repairmen, Supply Specialists, and Cooks). The analysis involved the comparison of Job Sample test scores of inexperienced men (at the time of the prior study) who subsequently remained in the Army, a comparable group of inexperienced men who subsequently left the Army, and the experienced men who had been in their jobs at least 30 months at the time of the prior study. There was no clear evidence that selective factors contribute to the higher performance of experienced men. It was concluded that this better performance was attributable to their growth on the job.

FORGE–Division No. 4

Factors in Military Organizational Effectiveness
(Research for the Department of the Army)

The Effects of Command Position Upon Evaluations of Leader Behavior, by L.L. Lackey, Joseph A. Olmstead, and Harold E. Christensen, Technical Report 72-32, 27 pp., November 1972. AD-755 506 ED-070 902

The study was designed to determine the effects of command position–battalion commander and company commander–upon evaluations of the desirability of certain leader actions. Twenty-two U.S. Army officers who had served as battalion commanders (Group I) and 22 who had served as company commanders (Group II) rated 36 leader actions on their desirability for battalion and for company commanders. Battalion commanders do not differentiate between the two command levels on the desirability of the leader actions. Company commanders differentiate about actions concerned with the centralization of authority and responsibility, and consider these to be more desirable for both command levels. Both groups rated positive motivation and emotional support as desirable and punitive or negatively motivating actions as slightly undesirable. The implications of the differences in expectations about leader behavior on effective organizational functioning, leadership doctrine, and training are discussed.

Components of Organizational Competence. Test of a Conceptual Framework, by Joseph A. Olmstead, Harold E. Christensen, and L. L. Lackey, Technical Report 73-19, 102 pp., August 1973. AD-767 548 ED-080 889

The study was designed to identify and explore organizational processes critical to effective functioning and to determine how functioning of the processes is influenced by environmental pressures. A framework was developed based upon the concept of Organizational Competence and an Adaptive-Coping Cycle consisting of seven critical processes. Ten 12-man groups of experienced Army officers participated in an eight-hour role simulation of a light infantry battalion engaged in combat operations. Player communications were content-analyzed for quality of process performance, and the organizations' activities were evaluated for military effectiveness. It was concluded that Organizational Competence is a principal determinant of effectiveness, that an organization's ability to respond flexibly to pressure and changes in its environments is related to its competence, and that proficient performance of the identified processes improved effectiveness.

FORGE *(Cont.)*

"Leader Performance as Organizational Process. A Study of Organizational Competence," by Joseph A Olmstead, in *Contingency Approaches to Leadership*, James G. Hunt and Lars L. Larson (eds.), Southern Illinois University Press, June 1974.

The concept of "Organizational Competence" defined as the processes used by organizational systems to cope with their environment was studied to determine its validity as an approach to the analysis of organizational behavior. One-hundred-twenty combat-experienced infantry officers took part in an exercise simulating combat operations to study the following processes: sensing, communicating information, decision making, stabilizing, communicating implementation, coping actions, and feedback. Results showed that competence is an important factor in effectiveness because it is concerned with the quality of performance of personnel who occupy leadership positions within an organization. Results also demonstrated that (a) competence is an important factor in the ability of organizations to adapt to rapidly changing conditions and to cope with intense environmental pressures, (b) the quality of process performance is affected by both change and pressure; and (c) effective organizations can maintain competence in the face of change and pressure.

GUARDTRAIN—Division No. 2

Development of a Curriculum for Pre-Service Guards at the Illinois Corrections Training Academy

(Research for the Illinois Department of Corrections Training Academy)

Guard-Train. A Training Curriculum for Illinois Prison Correctional Officers, by Peter B. Wylie and Ronald E. Kraemer, Final Report FR-D2-74-5, June 1974.

This report describes an effort to develop a pre-service/in-service curriculum for prison correctional officers. A review of the literature on existing correctional officer training programs around the United States was made. The curriculum development process also involved a specification of tasks performed by, and problem situations frequently faced by, correctional guards.

IDENTIFY—Division No. 4

Identification of the Individual Differences Involved in Human Mine Detection

(Research for the U.S. Army Mobility Equipment Research and Development Center)

Identification of the Potential Characteristics, Aptitudes, and Acquired Skills Involved in Human Detection of Mines, by Jeffery L. Maxey, Theodore R. Powers, T.O. Jacobs, and George J. Magner, Technical Report 73-18, 49 pp., August 1973. AD-769 780

This report summarizes findings from three research tasks comprising Project IDENTIFY. In the first phase, a job model for human mine detection was developed, a psychological analysis of the mine and boobytrap detection process was conducted, and literature on the individual differences involved in visual discrimination was reviewed. From the information developed, 24 variables were identified as potential predictors of mine and boobytrap detection performance. In the second phase, predictor measures for mine and boobytrap detection were developed and validated. The results of the validation showed that mine and boobytrap detection was primarily dependent upon search speed and the effort that appeared to be expended during search. Also, detection rates and distances were computed for each type of mine employed during the validation. In the third phase, personnel selection and training methods for mine and boobytrap detection were identified and recommended.

IDENTIFY *(Cont.)*

Investigations of the Human Factors Involved in Mine Detection in Varying Operational Environments, by Jeffery L. Maxey, Theodore R. Powers, T.O. Jacobs, and George J. Magner, HumRRO Technical Report in press.

This report summarizes findings from the four research tasks comprising Project IDENTIFY for FY 74. During FY 73 research into the identification of the individual differences involved in mine detection produced a body of human factors data relevant to the mine detection problem. A major purpose of the FY 74 research was to continue gathering and analyzing human factors data in the area of unaided mine detection. This research was designed not only to gather additional human factors data for an unpopulated field environment (*Task D*), but also to gather it for a built-up area environment (*Task E*). In addition, it was designed to identify the human factors involved in vehicular operations, both along an established road and in a cross-country setting (*Task F*). This research also provided an opportunity to test and evaluate a film simulator developed by the Picatinny Arsenal as a tool for the selection and training of military personnel (*Task D*). Finally, it provided an opportunity to re-examine the data from the FY 73 HumRRO study (*Task G*) to investigate the reliability of the data from individual subjects, the construct validity of the individual measurements, and the underlying dimensions of field detection performance.

IMPACT[1] –Division No. 1 (System Operations)
Prototypes of Computerized Training for Army Personnel
(Research for the Department of the Army)

Project IMPACT—Computer-Administered Instruction. Preparing and Managing the Content of Instruction, IMPACT Text-Handling Subsystem, by The IMPACT Staff, Technical Report 71-21, 47 pp., September 1971. AD-732 863 ED-055 450

Project IMPACT is a comprehensive advanced development project designed to produce an effective and economical computer-administered instruction (CAI) system for the Army. This report describes the concepts, approach, and implementation of the Project IMPACT text-handling subsystem. The computer-based facilities for preparing, storing, and retrieving the content of CAI courses of instruction are described, as are CAI courses. Computer software tools are described in terms of their use by course authors.

"Current Status of Computer-Administered Instruction Work Under Project IMPACT," by Robert J. Seidel, Professional Paper 18-72, 14 pp., July 1972, based on paper for CONARC Training Workshop, Fort Gordon, Ga., October 1971. AD-752 099 ED-067 842

With shrinking financial resources and a smaller, largely volunteer Army, demands made on personnel and the importance of each individual soldier will increase, posing difficult problems in training. The training must deal with widespread student differences, provide an increasing number of complex skills, and use even smaller numbers of skilled instructors. Computer-administered instruction (CAI) is a most promising approach, if it is developed as a comprehensive and total system. The goal of Project IMPACT is to provide an effective, efficient, and economical CAI system in a total system framework. This paper reviews the (a) reasons for establishment of Project IMPACT, (b) nature of the project and its relevance to needs of the Army, (c) reasons why the Army needs to develop its own capability in CAI, and (d) directions and prospects for delivery of specifications for an operational CAI system for the Army within the next two years.

[1] Research begun under Work Unit IMPACT was continued under Work Unit CATALIST.

IMPACT *(Cont.)*

Project IMPACT Software Documentation. Overview of the Computer-Administered Instruction Subsystem, by John Stelzer and Jean Garneau, Technical Report 72-21, 36 pp., August 1972. AD-751 776 ED-067 883

This overview of the IMPACT Computer-Administered Instruction Software Subsystem describes the rationale and motivation for the development of the software. A series of Research Products, available through information retrieval systems, will completely document the technical details of the software. In this overview, software subsystem components are identified and their interactions are described. The system is described in terms of real-time vs. off-line operations. Flowcharts are provided to show the general pattern of information processing within the system.

Project IMPACT Software Documentation. II. The IMPACT Data Evaluation System—Version 2 (IDES-2), by Leslie Willis and John Stelzer, Research Product RP-D1-72-1, 120 pp., August 1972. AD-753 948

The IMPACT Data Evaluation System—Version 2 (IDES-2) provides a storage, retrieval, and analysis capability for data generated in Project IMPACT's CAI environment. IDES-2 uses standard PL/1 techniques to perform the required storage, retrieval, and file maintenance activities. Statistical analysis in IDES-2 is provided through the Biomedical (BMD) statistical analysis package, augmented as required at Project IMPACT by especially prepared routines. IDES-2 provides extensive, standard reports summarizing student activity, which are used by authors to evaluate the effectiveness of the instructional material. IDES-2 reports are also used by IMPACT's research personnel to monitor student activity. As a result, IMPACT is able to develop increasingly more efficient instructional decision models. The storage and retrieval component in IDES-2 is documented in detail in this document. All IDES-2 reports, including the method through which each report is generated, and its contents are described, and examples of reports are provided

Project IMPACT Software Documentation. III. The IMPACT Data Evaluation System—Version 1 (IDES-1), by John Stelzer and Leslie Willis, Research Product RP-D1-72-2, 175 pp., August 1972. AD-753 949

This report describes the IMPACT Data Evaluation System—Version 1 (IDES-1), IDES-1 has two main components storage/retrieval and analysis. The storage/retrieval component is used to update and maintain an extensive data base of Computer-Administered Instruction (CAI) generated data, as well as to retrieve selective data elements from the data base. The data are used for psychological research in learning, and for evaluating the instructional material. In IDES-1, the storage/retrieval function is performed through a list processor, SLIP. IMPACT's version of SLIP has been modified and extended for more efficient operation. The analysis function in IMPACT is intended to provide statistical analysis of data base subsets. This function is performed through the BMD statistical analysis package, augmented by specially prepared programs. This document describes in detail the storage and retrieval portion of IDES-1 (SLIP itself and the BMD package are not described).

Project IMPACT Software Documentation. IV. The Interface Subsystem Framework for Instructional Decision Modeling, by William Underhill and John Stelzer, Research Product RP-D1-72-3, 188 pp., August 1972. AD-753 950

The IMPACT Computer-Administered Instruction (CAI) software subsystem utilizes Coursewriter III as its primary vehicle for providing student instruction. IMPACT Coursewriter III instructional material is structured into divisions, with each division having one or more instructional modules. Each module has a Telling (T) section with Practice (P) subsection, and a Quiz (Q) section. A student may recapitulate any completed module, review his current module's T-section, or jump to the current module's practice or quiz sections. System-scheduled remediation is also provided for in IMPACT's instruction. The Interface controls all intermodule and intramodule transfers. It is used to assemble the appropriate label when a transfer is made. The label is returned to Coursewriter III and is used in a Coursewriter III branch instruction. Interface permits an author to specify, for each individual student, a separate and unique division and module structure. Thus, it also allows the author to specify an individual course for each student with the course components being drawn from a pool of instructional material.

Project IMPACT Software Documentation. V. File Activity Control System (FACS), by Leslie Willis, Jean Garneau, and John Stelzer, Research Product RP-D1-72-4, 60 pp., August 1972. AD-753 951

The Project IMPACT File Activity Control System (FACS) is an authoring aid used to assist in the development of instructional text. FACS provides printouts of textual elements in the exact format that they appear to the student on the cathode ray tube. FACS also provides printouts of logical units of instructional elements in compressed form. FACS allows an author to perform character string searches on the instructional text files in order to identify elements that contain specified character strings. Instructional elements can be stored with administrative data identifying the author of the text and the date of preparation. Generally, FACS prints this information with its reports and allows modification. This report describes the use and operation of the FACS system. Reports produced by FACS are also described.

Project IMPACT Software Documentation. VI. Volume 1, Zeus Functions and Design Concepts, by Jean Garneau and John Stelzer, Research Product RP-D1-72-5, 90 pp., August 1972. AD-753 952

This research product provides a description of Project IMPACT's time-sharing monitor, Zeus, which extends the capabilities of an IBM 360 or 370 computer system. Its functions, capabilities, structure, and operation are discussed. Zeus provides capabilities needed for real-time, interactive computer applications using cathode ray tube displays. This document is intended primarily for systems programmers, and is part of a series that will completely document the IMPACT software subsystem.

Project IMPACT Software Documentation. VI. Volume 2, Zeus Program Logic Descriptions, by Jean Garneau, William Underhill, and Doris Shuford, Research Product RP-D1-72-5, 144 pp., August 1972. AD-753 952

This research product provides a description of Project IMPACT's time-sharing monitor, Zeus, which extends the capabilities of an IBM 360 or 370 computer system. Its functions, capabilities, structure, and operation are discussed. Zeus provides capabilities needed for real-time, interactive computer applications using cathode ray tube displays. This document is intended primarily for systems programmers, and is part of a series that will completely document the IMPACT software subsystem.

Project IMPACT Software Documentation. VII. IMPACT's Computer-Administered Instruction Software Subsystem, Coursewriter III, and Its Functions, by Doris Shuford and John Stelzer, Research Product RP-D1-72-6, 166 pp., August 1972. AD-753 953

The computer-administered instruction (CAI) language component in Project IMPACT's CAI system is an IBM program product, Coursewriter III Version 2, which has been modified slightly at IMPACT. The modifications concern what data are recorded by Coursewriter III and how and when data are recorded. The modifications also provided for special handling of invalid sign-on attempts, and special processing of commands and symbols not normally recognized by Coursewriter III. IMPACT has also developed and has in use several Coursewriter III functions for clearing counters and switches, for storing and loading buffers and counters, for special processing of buffers, for processing student response, for recording data, and for performing arithmetic computations on-line. This document provides detailed documentation on all Coursewriter III modifications made at IMPACT and on all Coursewriter III functions used at IMPACT.

Project IMPACT Software Documentation. VIII. Computer-Administered Instruction Computer Program Logic for COBOL2 Course of Instruction, by Douglas Spencer, Elizabeth Sowell, Leslie Willis, and Jean Garneau, Research Product RP-D1-72-7. 136 pp., August 1972. AD 762 445

This research product provides a detailed description of the computer program that controls the instructional logic for COBOL2, the IMPACT-developed course in the programming language COBOL. The program is written in the Coursewriter III, Version 2 language. Course structure, student options for modifying presentation of course material, and coding conventions are discussed. Also presented are the IMPACT-developed Coursewriter III macro instructions used in coding the course and the detailed instructions for computing scores on all quizzes. Partial Program listings for the entire course are included.

IMPACT *(Cont.)*

Project IMPACT Courseware Subsystem. Volume I—Innovative Procedures for Development and Administration, by Michael J. Hillelsohn, Technical Report 74-1, 141 pp., February 1974. AD-776 380

This report describes the practical, problem-solving techniques used in the design, documentation, and course materials of computerized training courses which comprised the courseware subsystem of Project IMPACT. The unique separation of course content and logic in the IMPACT system permitted these innovations. Course structure and format were standardized to meet the requirements of individualized training, controlled in part by each student and in part by a formal Instructional Decision Model (IDM). Standardized documentation, on-going and on-line, was employed to allow maximum author creativity with minimum difficulties in the management of course development and administration. A wide variety of samples and other detailed appendices are presented for the in-depth reader who wishes to pursue particular aspects of the total courseware package.

INGROUP—Division No. 4

Small-Group Instructional Methods for Military Training
(Research for the Department of the Army)

Small Group Instruction, Theory and Practice, by Joseph A. Olmstead, paperback, 129 pp., 1974, based on *Handbook of Small-Group Methods of Instruction*, Research By-Product, RBP-D1-71-27, May 1972, and *Theory and State of the Art of Small-Group Methods of Instruction*, Technical Report 70-3, March 1970, both by Joseph Olmstead.[1]

This volume is an analysis of the state of the art of small-group methods of instruction. It describes some of the more commonly used small-group techniques and the rationale behind them, and provides an analysis of their potential use for various types and conditions of instructional environments. Explicit guidelines are provided to assist trainers and training managers in selecting methods that will accomplish desired instructional objectives and in using the methods effectively.

INTERFACE—Western Division (TX)

Simulation and Training Methods for Maintenance and Operation of Advanced Military Electronics Systems
(Research for the Department of the Army)

"Effective Low-Cost Simulation," by Elmo E. Miller, paper for Sixth Annual Naval Training Equipment Center and Industry Conference, Man—The Focus of the Training System, Orlando, Florida, November 1973; in Proceedings, NAVTRAEQUIPCEN IH-226, pp. 428-440.

The development of a low-cost trainer for the tactical control officer in the Hawk missile system is discussed. The trainer was designed to be entirely self-instructional and self-paced, without prerequisites, when used with the associated training aids and materials. Students working in pairs performed better than those working alone. Programming software is emphasized.

[1] See *Bibliography of Publications As of 30 June 1971*, p. 80.

JOBGOAL—Division No. 1 (System Operations)
Improved On-the-Job Training for Logistics Personnel
(Research for the Department of the Army)

Methods for Identifying On-the-Job Training Content When Surrogate Jobs Are Used for Training, by Robert C. Trexler and Patrick J. Butler, Technical Report 73-22, 151 pp., October 1973 (JOBGOAL II). AD-769 639

Research into problems associated with job training programs resulted in a method for defining on-the-job training where a substitute organization must serve as the training base for the organization in which the trainee ultimately will serve. The method involves determining the tasks required by the jobs men do in the target organization and determining which job positions in the training organization have the same tasks. The analytical procedures involved in this research permit identification of the best job position within the training organization which can be used as the OJT training position. Three OJT program models were developed, each based upon different assumptions regarding the program structure. In addition, a general method for utilizing the data to develop different programs, responsive to other assumptions and contraints, was developed.

JOBTRAIN—Division No. 1 (System Operations)
Development of a Method for Building Training Programs for Signal Corps Electronics Repairmen
(Research for the Department of the Army)

"The Trouble with Troubleshooting," by Richard M. Gebhard, in *Training in Business and Industry*, vol. 10, no. 4, April 1973, pp. 80-81.

An alternative system of teaching electronics repair was developed. Data on electronic systems needing repair were collected, and experienced Army technicians made a failure-effect analysis. By properly dividing "lore" into system-specific job aids and general training, repairmen were trained in 11 weeks as opposed to 26 weeks in conventional training.

LEADREVIEW—Division No. 4
The Development of a Comprehensive Review of Psychological and Sociological Literature on Organizational Leadership
(Research for the Department of the Navy, Office of Naval Research)

"Leadership and Social Exchange," by T.O. Jacobs, Professional Paper 17-72, 18 pp., July 1972, based on paper for NATO conference, Brussels, Belgium, August 1971. PB-213 211

This paper presents a definition of leadership in relation to power and authority and in terms of the impact of various types of influence attempts in formal organizations. The actions and reactions of superordinates and subordinates occur in terms of cultural values, group norms, and social responses derived from the social learning processes. Leadership is a type of role behavior that is learned and executed better by some than by others, depending upon the resources that they can apply to the attainment of group goals. Social exchange theory seems to provide a useful framework for analysis of the impact of superordinate influence attempts.

LISTEN–Division No. 3

Development of Automated Programs to Improve Listening Skills Required in Army Jobs
(Research for the Department of the Army)

"Learning by Listening," by Thomas G. Sticht, *Language Comprehension and the Acquisition of Knowledge*, Roy O. Freedle and John B. Carroll (eds.), © V.H. Winston & Sons, Inc., issued as Professional Paper 21-72, 33 pp., November 1972. AD-755 601

Listening is discussed as the process of comprehending spoken language. Studies are described in relation to a simple model of the development of reading ability. Implications of the model for measuring reading and listening abilities are indicated, with emphasis on conceptual issues related to measuring outcomes following instruction in learning by listening. A rudimentary model of hierarchical features of spoken messages that may be used by a listener in tracking a message is described in relation to teaching listening. Research to explore means for reducing reading demands in training or job situations is discussed, one approach being the possibility of substituting learning by listening for learning by reading.

MARKSMAN–Division No. 4

Combat Marksmanship
(Research for the Department of the Army)

"Perspectives on Simulation and Miniaturization," by Michael R. McCluskey, paper for CONARC Training Workshop, Fort Gordon, Ga., October 1971, issued as Professional Paper 11-72, 15 pp., June 1972. AD-748 082 ED-066 910

Training applications of simulation and miniaturization are examined, as are areas where research is needed to develop cost-effective simulation methodologies for training. In order for simulation and miniaturization techniques to reach maximum levels of effectiveness, systems analysis is needed to define physical and psychological dimensions, relationships, and aspects. Among the aspects of the system to be considered for simulation are equipment components, personnel, organization, system procedures and processes, input data, output data, and environment.

MARS–Division No. 7 (Social Science)

Research Studies and Analysis on Procurement, Utilization, Performance, Retention, and Separation of Military Personnel
(Research for the Department of Defense)

Patterns of Drug Usage Among Vietnam Veterans, by Allan H. Fisher, Jr., HumRRO, MAJ K. Eric Nelson, Medical Corps, U.S. Army, and CPT Jacob Panzarella, Medical Service Corps, U.S. Army, Professional Paper 12-72, 11 pp., May 1972. AD-743 162 ED-070 966

A factor analysis was performed on an intercorrelation matrix of reported drug usage frequencies for seven drug categories at two consecutive periods of time. Subjects were 1,010 Army Vietnam veterans in pay grade E6 or below, aged 26 years or less. Retrospective reporting identified drug usage prior to a tour of Vietnam and during the tour. Four factors were extracted. (a) chronic use of marijuana, both before Vietnam and during Vietnam, (b) general drug usage during the Vietnam assignment, (c) pre-Vietnam narcotics usage, (d) pre-Vietnam soft drug usage encompassing both amphetamines and barbiturates. Implications derived were. (a) Improved procedures for selection may be required to identify potential enlistees and Vietnam assignees with drug use problems. (b) Separate rehabilitation efforts may be required to treat successfully both long term chronic drug users and men whose drug behavior was only recently acquired in Vietnam. (c) Additional analyses are required to study drug use experimentation in Vietnam to determine whether it leads to chronic use of narcotics.

MBO–Western Division (TX)

Implementation of Motivational Development Training Within Army Battalions
(Research for the Department of the Army)

"Implementation of Motivational Development Training Within Army Battalions," by John P. Fry, paper for the Southwestern Psychological Association Meeting, El Paso, Texas, May 1971.

This paper reports on an instructional package which trains key leaders of Army battalions in the behavioral skills of Organizational Development and enables them to train subordinates.

MEDASSESS–Division No. 1 (System Operations)

A State-of-the-Art Review of Techniques and Procedures for the Measurement of Complex Human Performance
(Research for the National Board of Medical Examiners)

"A State-of-the-Art Review of Techniques and Procedures for the Measurement of Complex Human Performance," by C. Dennis Fink, Harold Wagner, Richard D. Behringer, and Francis L. Hibbits, Consulting Report CR-D1-74-2, February 1974.

Undertaken in connection with NBME objectives for reviewing graduate medical education evaluation, this report describes recent efforts to assess complex human performance in nonmedical settings. Perceptual processes, communication (interpersonal) processes, and motor (psychomotor) processes were surveyed.

MEDIA–Division No. 2

Improving Media Implementation in Army Training Programs
(Research for the Department of the Army)

"Theoretical Framework, Some Basic Issues Related to Methods and Media Selection," by Ronald W. Spangenberg, Professional Paper 4-73, 9 pp., February 1973, based on paper for CONARC Training Workshop, Fort Gordon, Ga., October 1971. AD-758 437 ED-074 741

The basic thrust of this presentation is that media and methods selections are theoretical and cannot be definitively set out. Circumstances, themselves, may suggest solutions in terms of available media or methods that can be used in particular situations. Theoretical framework can often act as an aid, suggesting or reminding of possible media and methods solutions.

"The Motion Variable in Procedural Learning," by Ronald W. Spangenberg, *AV Communication Review*, vol. 21, no. 4, Winter 1973, pp. 419-436.

The effects attributable to motion were examined in a procedural learning task learned by observing a demonstration. In Study I, 40 male subjects disassembled an M85 machine gun, two conditions were created to compare a motion sequence with a still sequence. Study II was designed to test the hypothesis that motion focuses the subject's attention on the direction of movement or critical elements of the display. The results indicate that performance in the disassembly of a complex weapon by groups seeing a television display that portrays motion was superior to that of groups seeing a television display composed of a sequence of still shots. The portrayal of motion does not focus the subject's attention upon critical elements of the display.

MODE—Division No. 7 (Social Science)

Methods of Research Into Data Acquisition in Selected Social Problem Areas in the Military (Research for the Department of the Army)

A Comparison of Methods of Studying Illicit Drug Usage, by George H. Brown and Francis D. Harding, Technical Report 73-9, 48 pp., April 1973 (MODE I). AD-760 407

The purpose of this study was to compare the effectiveness of several methods of acquiring data on the nontherapeutic use of drugs. Data were collected by means of an anonymous questionnaire, a Randomized Inquiry technique, and a Card-Sort procedure. Subjects totaled approximately 1,100 enlisted men, noncommissioned officers, and junior officers, both Vietnam veterans and men without such experience. The sample was obtained from four Army posts between September and November, 1971. For enlisted men, the questionnaire and the Randomized Inquiry technique yielded substantially equivalent drug usage rates, for officers, the Randomized Inquiry technique yielded somewhat higher rates than the questionnaire. The Card-Sort procedure, as used here, was less effective as a method of collecting data on drug usage.

Drug Usage Rates as Related to Method of Data Acquisition, by George H. Brown, HumRRO Technical Report in press.

This report documents two studies concerned with the effect upon obtained drug usage rates of various methods of data acquisition. One study compares the anonymous questionnaire and the personal interview. The other compares five different types of questionnaire administrators. The research subjects were Army enlisted personnel in grades from E1 through E5. There were approximately 100 men in the first study, and 500 in the second. In both studies, the obtained drug usage rates, by a variety of criteria, did not differ for modes of data collection.

MODMAN—Division No. 5

Models for Systems Engineering of Man-Ascendant Jobs (Research for the Department of the Army)

"Procedures for Implementing Soft-Skill Training in CONARC Schools," by John P. Fry, paper for CONARC Soft Skills Conference, Fort Bliss, Tex., December 1972, included in *Soft Skills. Definition/Behavioral Model Analysis/Training Procedures*, Professional Paper 3-74, 39 pp., March 1974. AD-778 168

This paper describes seven characteristics of the problem-solving approach to soft-skill training in use in CONARC C-22 courses: a job function orientation, an experiential orientation; a simulation orientation, a cooperative-evaluation orientation, a functional context orientation, a small-group orientation, and a learning- and student-centered orientation. Various improvements, stemming from student reaction, are suggested, including: making behavioral objectives known, adopting a "guided" discovery instructional format, making it easier to acquire information, integrating additional process-based job functions into existing training goals, bringing behavioral scientists into the analysis of job functions, training students and instructors to use a problem-solving framework; and training administrators in OD skills.

"What Are Soft Skills?" by John P. Fry and Paul G. Whitmore, paper for CONARC Soft Skills Conference, Fort Bliss, Tex., December 1972, included in *Soft Skills. Definition/Behavioral Model Analysis/Training Procedures*, Professional Paper 3-74, 39 pp., March 1974. AD-778 168

A questionnaire developed to clarify the terms "hard" and "soft" skills was sent to representatives of CONARC schools. Based on the results, soft skills were defined as important job-related skills that involve little or no interaction with machines and whose application on the job is quite generalized. Army documents do not provide an adequate description of the behaviors, conditions, or standards associated with most of the job functions.

MPD II—Division No. 2

Evaluation of the Louisville Model Police District: Second Year of Operations
(Research for the Louisville, Kentucky Division of Police)

"Evaluation of the Louisville Experimental Police District. Second Year of Operation" by William C. Osborn and James H. Harris, Final Report (RP-D2-73-7), October 1973.

The Louisville Experimental Police District was instituted to achieve a reduction in crime through special programs in (a) police training, (b) police procedures, and (c) police-community relations. This report provides an evaluation of the experimental program at the end of two years. Evidence indicates that crime in the District had shown a greater decrease than that in other districts, and citizen attitude toward police had become somewhat above average. There was less progress in achieving innovative techniques of police operations, such as team policing. Creation of a special felony squad proved to be the most successful innovation.

NEPTUNE—Division No. 7 (Social Science)

The Structure of Enlistment Incentives
(Research for the Department of the Navy, Office of Naval Research, Psychological Sciences Division)

The Endorsement of Enlistment Incentives, by Allan H. Fisher, Jr. and Leslie S. Rigg, Consulting Report CR-D7-74-131, January 1974. AD-775 916

The appeal of 15 enlistment incentives was studied with a national sample of male, civilian youth as a function of. (a) the respondent's initial willingness to enlist, (b) his service preference, and (c) the date of survey administration. Incentives generally appealed more to youth predisposed to enlist than to youth reluctant to join the service, but the same incentives appealed to both groups. Both most favored the military assisting veterans in getting started in a civilian job, and least favored the opportunity to enroll in an officer training program. In general, the popularity of the incentives did not vary as a function of either the service preference of the respondent, or the date the survey was administered (June or November 1972).

The Structure of Enlistment Incentives, by Allan H. Fisher, Jr., Richard J. Orend, and Leslie S. Rigg, Technical Report 74-6, 81 pp., March 1974. AD-777 055

This research identified a series of factor structures of enlistment incentives. Factor analyses were performed on various target market segments of male, civilian youth using survey data from 1972. A four factor solution was found for the total sample (N=3915). (1) self-determination, (2) vocational training, (3) enlistment bonus, (4) general education. The factor structure was generally replicated among market segments denoted as potential enlistees (N=577) and non-enlistees (N=1311). Analysis of the data from market segments denoted as potential enlistees to the Army (N=117), Navy (N=170), and Air Force (N=157) yielded factor structures that deviated slightly from the above factor structure. While the Army solution resembled the solution for the total sample, the Navy and Air Force solutions differed from this solution and from each other. The factor structure of both reasons for enlistment and the enlistment incentives was also studied, results indicated that the two domains appear independent of one another.

NIGHTSIGHTS—Division No. 2
Training Techniques for New Night Vision Devices
(Research for the Department of the Army)

Effects of Information Load, Location, and Mode of Observation on Detecting and Identifying Brief Targets, by Harold P. Bishop, Technical Report 72-30, 23 pp., October 1972 (NIGHTSIGHTS VI). ED-070 926

The two experiments reported are part of a series evaluating effects of display parameters, task variables, and operator perceptual limitations on ability of Night Vision Device operators to process visual information quickly and accurately. For untrained observers, target brightness requirements were higher for identification than for detection, but were about equal for both responses with target exposure times greater than a critical time of 0.10 to 0.17 second. With shorter exposure times, the target brightness needed for detection or identification increased as exposure time decreased. Increasing information load and randomizing target location raised brightness requirements for identification. The results suggest that operator performance might be improved significantly by special training to increase the observer's area of attention and his capacity to process visual information.

NSF-IDM—Division No. 1 (System Operations)
Research on Instructional Decision Models
(Research for the National Science Foundation)

Course Modularization Applied. The Interface System and Its Implications for Sequence Control and Data Analysis, by E.W. Schneider, Professional Paper 10-73, 17 pp., November 1973, based on a presentation at the April 1972 meeting of the Association for the Development of Instructional Systems (ADIS). PB-227 255 ED-088 424

The Interface System is a comprehensive method for developing and managing CAI or CMI courses composed of sets of instructional modules. Each module is defined by one or more behavioral objectives, and by a list of prerequisite modules that must be completed successfully before the specified module can be attempted. The System's key components are (a) a standard general structure for all modules, (b) a consistent method of labeling logic and text elements, and (c) computer programs (presently written in Coursewriter with Assembly Language functions) to regulate inter module student traffic, and execute system-controlled, and student-controlled instructional decisions.

Research on Instructional Decision Models [by Robert J. Seidel, Richard Rosenblatt, Edward Schneider, Michael Hillelsohn, Judy Compton, and John Stelzer], Final Report FR-D1-73-6, December 1973.

The purpose of this NSF grant was to conduct programmatic research in a computer-administered instructional (CAI) environment, in order to determine optimization procedures for a meaningful CAI system. The research strategy involved iterative development and testing of a series of Instructional Decision Models (IDMs), in a total systems effort (instructional strategy, hardware, software, content). Instruction was carried on by a dialogue between a computerized tutor and the student. Factors explored included the student's pre-course history, his characteristics at course-entry, a mapping of subject matter structure, and the within-course history of information exchange between student and program of instruction. Extension and elaboration of the IDMs was a natural outgrowth of selectively increasing the number of decision factors, elaborating the decision rules, and increasing the number of decision options.

NYSED-TO—Division No. 5

Qualitative Review of Terminal Objectives and Approximations in Reading
(Research for the New York State Education Department)

Evaluation of Terminal Objectives in Reading," by William H. Melching, paper for American Educational Research Association meeting, Chicago, Ill., April 1972. ED-061 274

This paper describes the results of an effort to apply a HumRRO-developed classification system to a set of terminal objectives in reading. The classification system contained five factors, each factor embracing three levels. A total of 312 terminal objectives (and 766 approximations) were classified by three raters. Agreement among raters was sketchy at the start of the rating, but improved dramatically with practice. It was concluded that (a) classifying objectives is a useful procedure by which to evaluate the communicability of objectives, (b) of all aspects of an objective, the verb is probably the most important, and (c) reading objectives are no more difficult to classify than are objectives in other instructional content areas.

OC LEADER—Division No. 4

Systems Engineering of Leadership Training for Officer Candidate Programs
(Research for the Department of the Army)

Leadership Instruction for Infantry Officer Candidates. Terminal Training Objectives, by James A Salter and T.O. Jacobs, Technical Report 73-16, 29 pp., July 1973. AD-769 638

A research effort was designed to assist in the systems engineering of the infantry Officer Candidate (OC) leadership program. A previously developed list of leadership tasks representing the critical job requirements that OC graduates are called upon to fulfill provided the data base for a training analysis. The training analysis portion of systems engineering methodology concerns the possibility that the task statements may be too broad and complex for effective training. Leadership experts converted the job task statement into subtasks that can serve as more limited and manageable terminal training objectives. Extensive use was made of technical literature on leadership theory and practice, with emphasis on leadership doctrine for junior officers. A total of 15 terminal training objectives (TTOs), along with their supporting knowledges and skills, were developed through an expansion of the leadership task statements selected as the most critical for training.

OFFICE-ED—Division No. 3

Research to Develop a Model Instructional Program in the Office Cluster of Business Occupations
(Research for the Pacific Grove, California, Unified School District)

Development and Pilot Test of a Career-Oriented, Peer-Instructional Model in the Office Cluster of Business Occupations, by Jacklyn E. Hungerland, Eugene R. Michaels, and John E. Taylor, Technical Report 72-28, 64 pp., October 1972. PB-213 136 ED 075 603

The purpose of this project was to develop an instructional model capable of producing high levels of student motivation and proficiency, using the office cluster of business occupations as a vehicle. A peer-instructional approach was used in developing the training system; elements emphasized were performance orientation, entry-level skill mastery, immediate feedback to students and teachers, individualization of instruction, heightened student motivation, high job relevance, and low cost. Fifteen job-instructional packets were developed, and seven were given a pilot test at Pacific Grove High School with promising results. A detailed plan for implementation and full evaluation was prepared as part of the report.

A Career-Oriented, Free-Flow, Peer-Instructional System, by Jacklyn E. Hungerland, Professional Paper 6-73, 11 pp., June 1973. PB-221 830

This paper presents a description of a performance-oriented, self-paced, free-flow, peer-instructional, career-progression instructional system. The model system was developed for the office cluster of business occupations, but has relevance for other curricula. Incorporated in the model are definitive measures for quality control and accountability.

Organizational Factors—Division No. 4[1]
(Research for the Department of Health, Education, and Welfare, Social and Rehabilitation Service)

Organizational Factors in the Performance of Social Welfare and Rehabilitation Workers, by Joseph A. Olmstead, Technical Report 71 20, 50 pp., August 1971, reprinted from *Working Papers No. 1. National Study of Social Welfare and Rehabilitation Workers, Work, and Organizational Contexts*, Social and Rehabilitation Service, May 1971. AD-733 913

This report summarizes present state-of-knowledge on organizational factors related to performance of social welfare and rehabilitation workers. It is based on a survey of general organizational literature, literature dealing specifically with the performance of social welfare and rehabilitation workers, and on HumRRO experience in applying research findings. Included are an analysis of major theoretical approaches to the study of organizations, a discussion of concepts and findings that have particular relevance for social and rehabilitation agencies, implications for applied research concerned with organizational factors that influence performance, and implications for the management of social welfare and rehabilitation organizations.

OSHA-Division No. 1 (System Operations)
(HumRRO Safety Series Report)

Check List of Occupational Safety and Health Hazards, HumRRO Safety Series Report, 1 July 1972, 126 pp. (For sale at $3.50)

This handbook lists safety and health hazards that can result from violating standards set forth under the Occupational Safety and Health Act. It is intended to serve as an aid in recognizing hazards and as an index to the pertinent federal standards that are violated. The industries and parts of the Code of Federal Regulations covered are. 29 CFR 1910 General Industry, 29 CFR 1915 Ship Repairing, 29 CFR 1916 Ship Building, 29 CFR 1917 Shipbreaking; 29 CFR 1918 Longshoring; 29 CFR 1926 Construction.

OSHA-COT—Division No. 1 (System Operations)
(Research for the Department of Labor, Occupational Safety and Health Administration)

Training Course for Compliance Safety and Health Officers, by A. James McKnight, Paul Boustaunau, and James D. Tscheehtelin, Final Report FR-D1-72-2, 67 pp., January 1972.

This report describes revision of the Compliance Safety and Health Officers course for the Department of Labor, Occupational Safety and Health Administration. The CSHO's job was analyzed in depth, in accord with OSHA standards, policies, and procedures. A listing of over 1700 violations of OSHA standards was prepared, and specialists in occupational safety and health then evaluated each violation in terms of criticality based on likelihood of hazard, probability of effect, severity of effect, and range of effect. A set of "performance" and "knowledge" instructional objectives was then established, and a four-week course was developed including these features. (a) instruction paralleling sequence in which activities are performed, (b) an Instructor Manual having course guide and lesson plans, (c) a student handbook having a course outline, course objectives, and reference materials, (d) an intermingling of "compliance" and "standards" instruction, and (e) role-playing exercises to provide realistic practice for CSHOs in dealing with employers and employees.

[1] See also Project SOURCE

PLAQUE—Division No. 1 (System Operations)

Development of a Self-Administered Plaque Index for Children
(Research for the Department of Health, Education and Welfare, Bureau of Health Manpower Education)

Development and Evaluation of Self-Applied Plaque Indices for Children, by Harold G. Hunter and C. Dennis Fink, Professional Paper 10-74, 12 pp., June 1974 (CR-D1-73-4, July 1973). PB-234 663

A main goal of preventive dentistry is to encourage children to remove plaque at least once a day. Two scoring systems were combined with two disclosants for a total of four experimental systems administered to 128 children. In the first system, the Count Method, the child counts the number of stained teeth, the second system, the Rating Method, calls for a selection of one of five color photographs that looks most like the child's own mouth. While both methods appeared to be satisfactory for scoring plaque, the Count Method was superior in reliability and teachability. Also, the Count Method does not depend on additional materials (photographs). Since self-scoring systems sample only facial anterior surfaces, they may not be satisfactory for routine evaluation in a preventive program. They are, however, reasonable substitutes for professional indices in epidemiological surveys.

PREDICT—Division No. 6 (Aviation)

Correlational Analysis of Aviator Performance
(Research for the Department of the Army)

"Multivariate Performance Prediction," by James Dees, paper for Southeastern Psychological Association Convention, Atlanta, Ga., April 1972.

This paper discusses development of a set of regression equations which the U.S. Army Primary Helicopter School could use in determining whether an individual should continue flight training or be eliminated from the program. An estimated probability of successful course completion can be computed, along with an estimated end-of-course grade and percentile ranking. On-going work includes attempts to predict aviator performance in combat on the basis of data bank information, whether an aviator will elect to remain in the service after his obligated tour of duty ends, and probability of aircraft accidents throughout an aviator's career.

PREVENT—Division No. 2

Military Educational Approaches to the Prevention of Non-Therapeutic Use of Drugs
(Research for the Department of the Army)

Educational Approaches to the Prevention of Non-Therapeutic Use of Drugs, by Richard E. Kriner, David C. Routenberg, and Carol L. Seabright, Technical Report 73-11, 75 pp., May 1973. ED 008 070

A set of guidelines for use in drug education programs was developed in a four-phase study of various aspects of drug usage and drug education. In Phase I of the study, a questionnaire on drug usage and related attitudes was developed and administered to 2,119 military personnel at Fort Knox, Kentucky. Phase II involved a review of 15 civilian drug education programs, their characteristics, and the suggestion of a model drug education program approach. Phase III was a brief review of psychological theory and research regarding attitude change. Based upon data and information obtained from the first three phases, 18 guidelines that can be useful in the conduct of a drug education program were formulated during Phase IV.

A Look at Some Current Drug Abuse Prevention Programs, by Carol L. Seabright, *Journal of Drug Education*, vol. 3, no. 2, Summer 1973, pp. 127-140; issued as Professional Paper 12 73, 13 pp., December 1973.

A number of drug abuse prevention programs are reviewed, outlining such aspects as the basic orientation and comprehensiveness of the programs and the audiences to whom the programs are directed. The review also covers the different individuals involved in the direction and presentation of the program and their use of persuasive and educational techniques. The different types of training for those involved in the presentation are also reviewed. Some conclusions are presented about drug education programs based on opinions of drug education experts, and some suggestions are included for a model that could be formulated from the review.

PRISM[1] —Division No. 1 (System Operations)

Procedures for Individualized-Instruction System Management
(Research for the Department of the Army)

Individualized Course Completion Time Predictions. Development of Instruments and Techniques, by Harold Wagner, Richard D. Behringer, and Currell L. Pattie, Technical Report 73-25, 39 pp., November 1973. AD-772 992 ED-088 423

A system for predicting individual self-paced course completion time was developed and tested. Such a system permits the timely reporting of assignment information and the efficient utilization of course graduates. A predictive test battery was developed, consisting primarily of content-related tests and "mini-lessons" that were directly associated with the Stock Control and Accounting Specialist (MOS 76P20) course. Such predictors proved to be better than general aptitude measures for predicting course completion time in this training program. Stepwise multiple linear regression analyses were used to develop predictive functions and determine potentially useful predictors. Nomographs were constructed to display the predictive equations and are recommended for use.

Computer Simulation as an Aid to Managers of Training, by Harold Wagner and Patrick J. Butler, Technical Report 73-34, 98 pp., December 1973. ED-088 506

General Purpose Simulation System (GPSS) simulations of hypothetical self-paced training programs were performed in this study. The purpose was to evaluate the utility of this technique as a planning aid for managers of training who are faced with implementing a self-paced course. These managers must have information that permits reliable and accurate planning of instructional resources, facilities, and materials. Completion time distributions from the self-paced Stock Control and Accounting Specialist (MOS 76P20) course were used in the GPSS simulations. Other variables that entered the model included attrition rates, absentee rates, and follow-on course quotas. The final GPSS model forecasts such items as the daily training load, the daily student output, and the number of absentees. In addition, the model permits the evaluation and selection of optimum follow-on course scheduling policies.

REACTION—Division No. 4

Public Attitudes About Hazardous Wastes and Hazardous Waste Disposal Sites
(Research for U.S. Environmental Protection Agency)

Public Attitudes Toward Hazardous Waste Disposal Facilities, by L.L. Lackey, T.O. Jacobs, and S.R. Stewart, (HumRRO Final Report D1-73-8) EPA-670,2-73-086, 186 pp., June 1973, PB-223 638, issued as HumRRO Technical Report 74-8, 170 pp., April 1974.

This project had three purposes. (a) survey public attitudes toward a proposed system of national disposal sites (NDSs), (b) develop a behavioral model as a means of predicting citizens' reactions to an NDS in a particular location, and (c) propose an effective public information campaign. The national survey, sampling randomly and purposefully selected respondents (key influentials), was conducted in 10 counties selected as feasible NDS locations. The questionnaire elicited information about three classes of variables considered predictive of citizen reaction to an NDS (a) contextural (physical, economic environment), (b) situational (social environment), and (c) individual (personal attitudes, beliefs) which constituted the basic structure of the behavioral model. Most respondents have positive attitudes toward an NDS, would accept one in their county, and believe an NDS would be beneficial to their area. About half wanted additional information before agreeing to a nearby NDS. Most respondents named the mass media (TV and local newspapers) as the greatest source of influence on their environmental and ecological attitudes. A generalized public information program designed to create public acceptance of NDSs is outlined.

[1] Research for Work Unit PRISM was begun under Work Unit STOCK.

READNEED—Division No. 3

Methodology for Evaluating Reading Requirements of Army Jobs
(Research for the Department of the Army)

"Development and Evaluation of Job Reading Task Tests," by Thomas G. Sticht and John S. Caylor, paper for symposium at annual meeting of American Educational Research Association, April 1972. ED-064 683

Describes research to develop job reading task tests (JRTT) for three military jobs having civilian counterparts: cook, automotive repairman, and supply clerk. Relationships of general reading ability to performance on JRTT are described for men in three groups: an unselected sample, a group selected for special aptitude in a JRTT area, and a group both selected and trained in the JRTT area. Results indicate that, while general reading and JRTT performance are positively correlated, the JRTT are sensitive to selection and training, and hence are measures of special job-reading abilities as well as of general reading abilities.

"Development of a Simple Readability Index for Job Reading Material," by John S. Caylor and Thomas G. Sticht, paper for the annual meeting of the American Educational Research Association, New Orleans, Louisiana, February 1973. ED-076 707

The FORCAST readability index was developed to predict the reading grade level of Army technical job reading matter used to train young male soldiers. Based on a single variable—the number of one-syllable words per 150-word passage—the index has been compared with the Flesch and Dale Chall general readability indices and found to be valid. Morever, FORCAST can be applied readily by clerical personnel without special training or equipment. The data it provides are realistic guides to matching a soldier's reading materials to his reading ability.

Methodologies for Determining Reading Requirements of Military Occupational Specialties, by John S. Caylor, Thomas G. Sticht, Lynn C. Fox, and J. Patrick Ford, Technical Report 73-5, 71 pp., March 1973. AD-758 872 ED-074 343

READNEED research was concerned with the development of methodologies for determining reading requirements of Army MOSs. Three approaches for assessing MOS literacy demands are described: (a) analysis of readability of Army MOS materials using a newly developed readability formula calibrated on Army personnel and Army job materials, (b) use of information currently in Army data banks to study relationships between reading ability (estimated from AFQT) and job proficiency (indexed by the Primary Military Occupational Specialty/Evaluation Test), and (c) direct assessment of personnel reading skills in relation to proficiency on specially constructed Job Reading Task Tests (JRTT). Feasibility studies that indicate the relative merits of each approach, and certain conceptual and operational problems in determining literacy requirements of jobs are described.

REALISTIC—Division No. 3

Determination of Reading, Listening, and Arithmetic Skills Required for Major Military Occupational Specialties
(Research for the Department of the Army)

Project REALISTIC. Evaluation and Modification of REAding, LIStening, and ArithmeTIC Needs in Military Jobs Having Civilian Counterparts, by Thomas G. Sticht, John S. Caylor, and Richard P. Kern, Professional Paper 19-71, 43 pp., September 1971, papers presented at Western Psychological Association meeting, Los Angeles, Calif., April 1970. AD-755 040 ED-057 334

The papers in this collection present a description of, and the results of, research in Work Unit REALISTIC. In addition to the first paper which is an overview, the three papers are: "Psychometric Determination of Relationships Among Literacy Skills and Job Proficiency," "Reading Ability, Readability, and Readership: Identifying Job-Related Reading Tasks Performed by Cooks, Clerks, and Mechanics," and "Reducing Discrepancies Between Literacy Skill Levels of Personnel and Literacy Demands of Jobs."

"Mental Aptitude and Comprehension of Time-Compressed and Compressed-Expanded Listening Selections," by Thomas G. Sticht, *Journal of Auditory Research*, vol. 10, 1970, pp. 103-109; issued as Professional Paper 6-72, 11 pp., March 1972. AD-743 274 ED-066 080

The comprehensibility of materials compressed and then expanded by means of an electro-mechanical process was tested with 280 Army inductees divided into two groups of high- and low-mental aptitude. Three short listening selections relating to military activities were subjected to compression and compression-expansion to produce seven versions. Data indicate that expanding previously compressed materials to restore the word rate to normal may restore the comprehension of the material to very near normal when the compression/expansion is limited to 40%. Present results substantiate findings that factors limiting the comprehensibility of rapid speech reside more with the inability of the listener to process rapid rates of speech than with the signal distortion produced by the equipment or compression process.

Determination of Literacy Skill Requirements in Four Military Occupational Specialties, by Thomas G. Sticht, John S. Caylor, Richard P. Kern, and Lynn C. Fox, Technical Report 71-23, 72 pp., November 1971. AD-736 865 ED-059 028

This report describes results of research on the extent of usage of job printed materials and job listening sources as a function of the reading difficulty level of the materials and the reading ability of Army job incumbents. Psychometric data were obtained on relationships of reading ability to performance on Job-Related Reading Task tests, and of reading, listening, arithmetic, and AFQT to job proficiency as indexed by Job Knowledge tests, Job Sample tests, and Supervisor Ratings in four Army jobs. Methods are discussed for reducing discrepancies between personnel literacy skill levels and the literacy demands of the job by remedial literacy training or redesign of job literacy materials. Research results are discussed with regard to implications for selection, training, and research.

"Project REALISTIC. Determination of Adult Functional Literacy Skill Levels," by Thomas G. Sticht, John S. Caylor, Richard P. Kern, and Lynn C. Fox, *Reading Research Quarterly*, vol. VII, Spring 1972, pp. 424-465; issued as Professional Paper 20-72, 43 pp., September 1972. AD-755 293

This paper describes data gathered on functional literacy levels for four selected Army jobs: Cooks, Vehicle Repairmen, Supply Clerks, and Armor Crewmen. The data showed that reading difficulty levels in the Repairman and Supply fields exceeded the reading ability of high aptitude men by four to six grade levels, that use of reading materials increased as skill in reading increased, that men in high-demand reading level fields tended to listen for information, and that information on tests, job performance, supervisor's ratings showed positive, significant correlations between literacy variables and the first two indices of job proficiency. Listening and job knowledge were less highly related than reading and job knowledge.

"Effects of Speech Rate, Selection Difficulty, Association Strength and Mental Aptitude on Learning by Listening," by Thomas G. Sticht and Douglas R. Glasnapp, *The Journal of Communication*, vol. 22, no. 2, June 1972, pp. 174-188, issued as Professional Paper 1-73, January 1973. AD-762 692

In two factorial experiments, adult male Subjects, aged 18-25, listened to tape-recorded passages presented at different rates of speech. Experiment 1 studied the effects of speech rate upon immediate retention, by a total of 204 high and low aptitude (AFQT) men, of material having readability of grade levels 6.0, 8.5, and 14.5. Low aptitude men learned the easier material better than the difficult material as a function of decreased speech rate, high aptitude men appeared to learn material best at around 175 wpm, independent of difficulty. Experiment 2 examined interactions of speech rate, aptitude, and the association strength of nouns in sentences on immediate retention, using a total of 138 men. High aptitude men lost disproportionately more material of low association strength than did low aptitude men when the speech rate was increased from 175 to 325 wpm.

RECRUIT—Division No. 7 (Social Science)
Research on Recruiting
(Research for the Department of the Army)

Enlistment Motivation and the Disposition of Army Applicants, by Allan H. Fisher, Jr. and Margi R. Harford, Technical Report 74-5, 72 pp., March 1974. (RECRUIT III) AD-776 973

Research was performed to (a) classify reasons for Army enlistment, and (b) identify factors associated with enlistment in the Army or another Service. Data from two samples of FY72 Army enlistees were subjected to factor analysis and hierarchical cluster analysis techniques to generate a four-way classification of reasons for enlistment: (a) vocational development, (b) enlistment in the Service of one's choice (Army) at the time of one's choice, (c) individual development and change, and (d) military personnel benefits, including the G.I. Bill. Automatic interaction detection and multiple regression techniques were applied to other FY72 data to identify factors associated with the disposition of initial Army applicants. The two factors most influential were educational level and race. Factors associated with the disposition of initial applicants to the Navy, Air Force, and Marine Corps were also identified.

RELAY—Division No. 7 (Social Science)
The Impact of Military Service on Occupational Aspirations and Development of Skills
(Research for the Department of the Air Force, Aerospace Medical Division)

Recruits' Civilian-Acquired Skills. Their Potential Value and Their Utilization in Initial Military Assignments, by Arthur J. Hoehn, Thurlow R. Wilson, and John A. Richards, (HumRRO TR 72-6), Technical Report AFHRL-TR-72-16, Manpower Development Division, Air Force Human Resources Laboratory, Air Force Systems Command, 129 pp., February 1972. AD-748 326

The objective of the research reported here was to assess the potential value and the utilization of recruits' civilian-acquired skills. A recruit was defined as having a military-relevant civilian-acquired skill if he had had six months or more of job experience in any of 67 common civilian jobs. The research data were obtained during March through June 1971 for four services: Two Army sites, one each for Navy, Marine Corps, and Air Force. Data were collected by administering questionnaires to recruits, obtaining judgments of classification interviewers, and extracting information on initial military assignment, enlistment commitment, and AFQT scores from official records. Results indicate about 40% of the entering personnel surveyed met the civilian-acquired skill (CAS) criterion. Job skills varied, but tended to concentrate in a few civilian job categories. Results suggest that 20-30% of the incoming personnel with six or more months of military-relevant work experience received assignments likely to make significant use of such experience.

Recruits' Military Preferences and Their Accommodation by the Military Services, by Arthur J. Hoehn, Thurlow R. Wilson, and John A. Richards, (HumRRO Technical Report 72-10), Technical Report AFHRL-TR-72-19 (in press), Manpower Development Division, Air Force Human Resources Laboratory, Air Force Systems Command, 121 pp., March 1972. AD-749 884

The principal objective was to provide information on recruits' military occupational preferences, match of military assignments to recruits' preferences, and changes that occur in these preferences between service entry and completion of basic training. Questionnaires were administered to recruits from four services just before classification interviewing and eight weeks later after initial military assignment. Small proportions of recruits' first choices were found to coincide with initial assignments in terms of DOD Occupational Groups. However, over 60% received assignments to DOD Occupational Areas to which they gave relatively high interest ratings. Perhaps, for this reason, most men expressed satisfaction with their initial assignments. Recruits considered the services did relatively well in getting and using information on aptitudes and educational background, but not so well on getting and using information on preferences and preservice work. Recruits need improved knowledge of the military work areas.

Recruits' Postservice Occupational and Educational Plans. Nature and the Extent of Influence From Early Military Experience, by Arthur J. Hoehn, (HumRRO Technical Report 72-15), Technical Report AFHRL-TR-72-28, Manpower Development Division, Air Force Human Resources Laboratory, Air Force Systems Command, 61 pp., April 1972. AD-750 145

Data on the nature of recruits' postservice occupational and educational plans, and on the influence that the first few weeks of military service have on such plans, were collected in March-June 1971 at Army, Navy, Marine Corps, and Air Force sites. One questionnaire was administered at the beginning, and one near the end of basic training. Results show that most recruits planned to be working full-time one year after service, but were uncertain as to the type of work they would be doing. The data suggest that 30-40% of the men considered their initial assignment out of line with their job plans for one year after service. Results on occupational plans for age 35 closely paralleled those for one year after service, but the men seemed to be more definite about the kind of work they would be doing. About 40% said that they planned to be attending college one year after leaving service. Results generally showed early service experience to have little, if any, impact on postservice vocational and educational plans.

Postservice Occupational and Educational Plans of First-Tour Military Personnel Nearing Separation From the Service, by Arthur J. Hoehn, (HumRRO Technical Report 72-19), Technical Report AFHRL-TR-72-42, Manpower Development Division, Air Force Human Resources Laboratory, Air Force Systems Command, 158 pp., June 1972.

A study was made of several aspects of the postservice educational and occupational plans for first-tour enlisted personnel nearing separation from military service. A questionnaire was administered at Air Force, Army, Marine Corps, and Navy sites. Analyses were made of the postservice plans of the respondents. Although most men expect to pursue full-time work, results show a widespread interest in further training or education. Only about one of four men expected to use his military job training experience, whether in a civilian job or in related education or training. Results suggest the need for continued, or even improved, pre-separation counseling to assist men in formulating their postservice plans, in locating jobs, and in becoming more aware of the potential value of the job skills they have acquired while in military service.

RETURN—Division No. 2
Prerelease Indicators for Military Prisoners
(Research for the Department of the Army)

A Partially Annotated Bibliography on Prediction of Parole Success and Delinquency, by Robert L. Dyer and James H. Harris, Research Product RP-D2-72-1, March 1972. AD-755 507

SAEPP–Division No. 2
Systematic Automotive Education Program Design
(Research for the Illinois Law Enforcement Commission)

"Development of a Systematic Automotive Education Program," by Peter B. Wylie, Donald F. Haggard, Dorothy C. Herbert, James H. Harris, Final Report FR-D2-74-4, June 1974.

The purpose of the Systematic Automotive Education Planning Project (SAEPP) is to provide techniques for developing and implementing realistic vocational training and placement programs for prisoner rehabilitation. Such programs are intended to be based on current and projected labor demands, tailored to trainee needs, and integrated within the society to which the prisoner must return. One objective of this research was to develop the citizens council concept; an Automotive Trades Council (ATC) was established to support formulating and implementing an automotive maintenance training program. In designing the SAEPP curriculum, a labor market analysis was performed to determine the availability of specific kinds of automechanics jobs. Occupational needs of released prisoners were determined. A task analysis of the auto mechanic's job was performed. A survey revealed the limited availability of auto mechanics training for ex-offenders in industry and public education.

SASPI–Division No. 1 (System Operations)
Systems Analysis of Self-Paced Instruction
(Research for the U.S. Army Research Institute)

A Systems Analysis of a Self-Paced, Variable-Length Course of Instruction, by C. Dennis Fink, Richard D. Behringer, Harold Wagner, and Morris Showel, Final Report FR-D1-74-3, June 1974, *Annex A. Training, Administrative and Disciplinary Problems Associated With the U.S. Army Clerk-Typist (MOS 71B10/20) Course, Annex B. A Comparison of Graduates, Dropouts, and Instructors of the U.S. Army Clerk-Typist (MOS 71B10/20) Course*, April 1974.

This study analyzed selected features of the Basic Army Administration Course (BAAC) which trains enlisted personnel for the 71B10/20 MOS. The objectives of the study were to obtain information which could be used to identify the strengths and weaknesses of the course, and to develop suggestions for improving the course. Questionnaires and structured interviews were administered to a sample of course students, dropouts, instructors, and school administrators of the 71B10/20 course at Forts Ord and Jackson during the Fall of 1973. In addition, the training environments at both Schools were inspected and student training records were analyzed. The study findings are reported in detail in two annexes to the final report. Annex A describes instructor and administrator opinions and practices as related to the course, and reports on the disciplinary problems associated with the course. Annex B describes student attitudes and performance. The final report contains a number of suggestions on how to improve the current 71B10/20 course.

SAWTRAIN–Division No. 4
Small Arms Weapons Systems Training Requirements
(Research for the Department of the Army)

The Effects on Training Requirements of the Physical and Performance Characteristics of Weapons, by T.O. Jacobs, Margaret S. Salter, and Chester I. Christie, Technical Report 74-10, 75 pp., June 1974.

The present research supported the Army Small Arms Requirements Study II (ASARS) Related Study 13, Training. Its purpose was to provide information from literature search and judgmental evaluation on (a) the minimum level of performance qualifying an individual to operate a weapons system, (b) the impact of the physical and performance characteristics of weapons on training required to reach this level, (c) the impact of post-1985 environments on training requirements, (d) identification of training requirements that cannot be expedited, and (e) priorities for allocation of resources for training, in terms of weapon performance characteristics. The findings demonstrated that weapon controllability is the ASARS characteristic with highest impact on training requirements, and the highest potential for return on resource investment. Although beyond the scope of this study, it could be concluded that improved weapon controllability might offer best opportunity for increased operational effectiveness.

SIAF–Division No. 4

Selection and Training for Small Independent Action Forces
(Research for Advanced Research Projects Agency)

Selection and Training for Small Independent Action Forces. Development of Materials and Procedures. by Joseph A. Olmstead, Theodore R. Powers, James A. Caviness, and Jeffery L. Maxey, Technical Report 71-17, 56 pp., August 1971. AD-737 709 ED-060 437

This report of Phase II of a three-phase research and development project describes the completion of the systems analysis and specification of the critical knowledges and skills required for Small Independent Action Forces (SIAF) performance, and development of 19 Program Descriptions training procedures and materials for developing the required knowledges and skills. (Program Descriptions had been developed in Phase I for 6 other content areas.) In addition, there is a description and provisional evaluation of a test battery for the selection of SIAF personnel. From a survey of current practices and job analysis data, candidate predictor variables were specified and instruments to measure the variables were identified or developed. Criterion tests of SIAF performance were developed for Phase III validation of selection procedures.

Selection and Training for Small Independent Action Forces. Final Report, by Joseph A. Olmstead, James A. Caviness. Theodore R. Powers, Jeffrey L. Maxey, and Fred K. Cleary, Technical Report 72-2, 62 pp., February 1972. AD-737 709 ED-060 437

The overall objective of this research was the development of procedures for selecting and training personnel to serve in Small Independent Action Forces (SIAF) units. This report of Phase III of the three-phase research and development project describes research that required two almost completely independent activities. (a) development of a composite training test, and (b) validation of selection tests and final development of selection materials and procedures into a Small Independent Action Forces Selection Program. Training procedures and materials for developing the required knowledges and skills were developed in Phases I and II.

SIMRAPP–Division No. 6

Identify and Develop Budgetary Estimates for Simulation Research, Development, and Procurement Projects Which Are Required During FYs 1967-1980 in Support of Army Pilot Training
(Research for the U.S. Army Training Device Agency)

Army Training Simulator Research, Development and Procurement, FY 1976-1980 Projects and Funding Summaries, by Paul W. Caro, Edward J. Miller, Melvin D. Montemerlo, and Wallace W. Prophet, Final Report, June 1974.

This report was prepared to provide the Army with information on which budget programs for FY 1976-1980 could be developed for simulator research and procurement programs. The emphasis is on rotary wing training requirements of the present and foreseeable future. The research team contacted organizations active in the simulation field for information. The study team first identified needed simulator research in problem areas, then estimated the level of funding for simulator projects. Research projects that could lead to more effective design and use of simulation in pilot training are described.

SKYFIRE—Division No. 5

Training Methods for Forward Area Air Defense Weapons
(Research for the Department of the Army)

Studies on Reduced-Scale Ranging Training With a Simple Range Finder, by Michael R. McCluskey, Technical Report 71-24, 35 pp., December 1971 (SKYFIRE I). AD-740 163

Three experiments of reduced-scale stadimetric ranging training were conducted for a criterion range of 1500 meters. The observers for all studies were trained in a reduced-scale (1/48) environment with stadimetric or occlusion ranging aids. Two of the studies also included a full-scale performance test with jet aircraft. The ranging training method consisted primarily of immediate feedback that contained either qualitative or quantitative information. The results of these studies indicated that. (a) the type of feedback (qualitative or quantitative) given during training does not affect ranging performance, (b) the reduced-scale training appears to be valid for the incoming direction of flight but not for the outgoing, and (c) the ranging skill acquired during training did not transfer completely to the full-scale environment. However, performance in the full-scale environment was as accurate after 30 days as it was at the completion of training.

Attempts to Improve Visual Detection Through Use of Search Patterns and Optical Aids, by Robert D. Baldwin, Technical Report 73-3, 33 pp., February 1973. (SKYFIRE III) AD-758 056

The research objectives were to compare the visual detection abilities of observers equipped with low- and moderate-powered optical systems, and to compare the detection capabilities of observers using different techniques or strategies for searching extensive visual displays. Visual experiments were conducted in a scaled reduction of an aircraft detection situation, comparing observer results using optical aids and unaided vision, a general conclusion was that "sharp" eyes are the best visual detection aids. Several search patterns experiments compared unstructured and structured visual search for simulated aircraft targets. Fundamental characteristics of vision—visual acuity and field of view—appear to be the major sources of variance in acquiring visual targets.

SKYGUARD—Western Division (Texas)

Curriculum and Instructional Improvements for the Air Defense Artillery Officer Advanced Course
(Research for the Department of the Army)

Use of the Job Model Concept to Guide Job Description Procedures for Army Officers, by Paul G. Whitmore, Technical Report 73-26, 36 pp., November 1973. AD-772 993 ED-086 827

The object of this study was to examine the job description procedures specified in CONARC Regulation 350-100-1, *Systems Engineering of Training*, February 1968, with reference to their use for officers' jobs, and to develop supplementary procedures for rectifying any deficiencies. Previous evaluations and recent applications of these kinds of procedures to officer jobs were reviewed. the major problem found was that the procedures authenticated existing conceptions of a job. It is proposed that major deficiencies can be avoided by beginning the job description process with development of a job model having three major sections. (a) broad job functions derived from appropriate system characteristics, (b) general behavioral science considerations appropriate to the analysis of each broad job function, and (c) information in categories, sources, and collection procedures required to fully explicate each broad job function. A partial model of Army officers' jobs is presented as an example.

SMMART–Division No. 2

Developing Criteria for the Selection of Methods and Media by Army Trainers
(Research for the Department of the Army)

The State of Knowledge Pertaining to Selection of Cost-Effective Training Methods and Media, by Ronald W. Spangenberg, Yair Riback, and Harold L. Moon, Technical Report 73-13, 133 pp., June 1973. AD-763 194 ED-078 295

Review and analysis of pertinent literature was the first step in research to develop criteria and procedures for optimal selection of cost-effective methods and media for use in Army training. The empirical data found in the review are insufficient as a basis for reliable selection of methods and media for specific training tasks. Also, existing methods-media selection procedures, training cost-analysis procedures, and suggested approaches for developing such procedures are inadequate for Army needs, although portions of some of these may be useful in developing procedures for Army use. Possible approaches for removing those inadequacies are discussed.

SOURCE–Division No. 4[1]

Organizational Factors in Work and Performance
(Research for the Department of Health, Education, and Welfare, Social and Rehabilitation Service)

Working Papers No. 2 Organizational Structure and Climate. Implications for Agencies, National Study of Social Welfare and Rehabilitation Workers, Work, and Organizational Contexts [HumRRO Final Report, by Joseph A. Olmstead, August 1972], (SRS) 73-05403, Department of Health, Education, and Welfare, Social and Rehabilitation Service, 187 pp., February 1973.

This report analyzes the literature concerned with the impact of the work context (i.e. structure and climate) on work, workers, and work performance, with special relevance for social welfare and rehabilitation agencies. It describes the properties common to all organizations, including structure, communication processes, and the motivational and attitudinal characteristics of personnel. The need to develop, and reward, good leadership is given special emphasis, since the quality of leadership available at all levels is crucial in determining the character of an agency's work context.

Research Report No. 2. Effects of Agency Work Contexts. An Intensive Field Study, Volume I-Report, Volume II-Technical Appendices, National Study of Social Welfare and Rehabilitation Workers, Work, and Organizational Contexts, Department of Health, Education, and Welfare, Social and Rehabilitation Service, (SRS) 71 05116, December 1973, (*Effects of Agency Work Contexts. An Intensive Field Study. Volume I, Agency Structure and Climate*, HumRRO Final Report-D4-73-14, *Volume II, Attitudes of Agency Personnel*, HumRRO Final Report-D4-73-15, by Joseph A. Olmstead and Harold E. Christensen, October 1973)

This project was concerned with the impact of organizational structure and climate on the attitude and performance of social welfare and rehabilitation workers. Thirty-two welfare and rehabilitation organizations were studied, and questionnaire and interview data collected on 80 dimensions related to organizational factors, employee attitudes, and performance. Implications derived are reported on the effects of structure and climate on the attitudes, motivation, and performance of personnel and the performance of agencies.

[1] See also "Organizational Factors."

SOURCE *(Cont.)*

Program Application Reports. Study of Agency Work Contexts. National Study of Social Welfare and Rehabilitation Workers, Work, and Organizational Contexts, Department of Health, Education, and Welfare, Social and Rehabilitation Service (HumRRO Research Product RBP-D1-73 16, by Joseph A. Olmstead and Harold E. Christensen, October 1973).

Report No. 1, *Implications for Supervision*, (SRS) 74-05405, December 1973.
Report No. 2, *Implications for Administration*, (SRS) 74-05406, December 1973.
Report No. 3, *Implications for Personnel Management*, (SRS) 74-05407, December 1973.
Report No. 4, *Implications for Training*, (SRS) 74-05408, December 1973.
Report No. 5, *Implications for Organizational Development*, (SRS) 74-05409, December 1973.

Five Application Reports summarize selected results and implications of an intensive field study concerned with the effects of work contexts on the attitudes and performances of personnel employed in social welfare and rehabilitation agencies. In discussing implications for the administration of agencies, the report suggests that climate may be more important than structure in welfare agencies, due to the nature of the work and the necessary relationships among the personnel. It recommends that agency managements give attention to those factors that impact on work and work performance in the following order of priority: agency goals, agency policies, communication, supervision, structuring of activities, stability of work environment, size of agency, dispersion of agency.

SPECTRA—Division No. 2
Evaluation Study of Counselor Training Program
(Research for the Department of Labor, Manpower Administration)

Bibliography for Curriculum Development in Counseling Skills for the Helping Professions, by Carol L. Seabright, Research Product RP-D2-72-4, August 1972.

Bibliographic material was gathered during an evaluation of a special USTES Counselor Training Program designed to provide the equivalent of one year of full-time education in vocational counseling with special emphasis on the disadvantaged client. The references were collected from 23 Counselor Training Programs being conducted in colleges and universities across the country. They are cross-referenced by subject area, for use by academic staffs conducting counselor training programs, and by Employment Service staff members conducting in-service training programs and as background material for studies in vocational counseling.

Evaluation of a Special Counselor Training Program Conducted by the United States Training and Employment Service, Part I. Administrative and Training Procedures, by William L. Warnick and Willard H. Pratt, Precis--Final Report and Final Report, MEL 73-01A, Contract No. 43-1-014-51, October 1972 (Spectra I). PB 214 532/4

This paper—the initial phase of a two-part evaluation of the Special Counselor Training Program—describes the administration and conduct of the various training programs. Findings are based upon data obtained from structured interviews with program personnel and trainees participating in 23 nationwide programs that were selected at random. Results indicate that the training programs have successfully met the educational purposes of the program. However, major problems exist, stemming mainly from the limited time and staff available at all ES levels and from the lack of explicit program procedures.

Evaluation of Special Counselor Training Program Conducted by the United States Employment Service, Part II. Job Oriented Training and Assessment Model, by Ronald E. Kraemer, Samuel P. Hudson, Richard E. Kramer, and Donald F. Haggard, Precis Final Report and Final Report, MEL 73-01B, Contract No. 43-1-014-51, November 1972 (Spectra II). PB-219 409

This report is the second part of a two-part evaluation of the Special Counselor Training Program. Work included the development of a job-oriented model for measuring trainee counseling effectiveness and a model for developing training programs that relates job requirements and training content. Data upon which these models are based were obtained primarily from a job/training survey of 697 entry-level counselors within the Employment Service. Report information can be used to design, develop, and evaluate ES entry-level counselor training - determining training needs, specifying the curriculum, and assessing training effectiveness.

SPECTRUM—Division No. 3

Development of Efficient Training for Soldiers of All Aptitude Levels (Research for the Department of the Army)

Aptitude Level and Performance on Intramodal and Intermodal Form Discrimination Tasks, by Gary Kress, Technical Report 73-7, 28 pp., March 1973. AD-758 874

This report presents the findings of research that compared high and low aptitude subjects on two form discrimination tasks that required both intramodal and intermodal functioning. In the first experiment, 20 high and 20 low aptitude Army trainees were required to make a simultaneous discrimination of nonsense forms, using vision and touch. The second experiment, with 30 high and 30 low aptitude men, introduced a delay period between the presentation of the standard and comparison stimuli. For the first experiment, results showed that the high aptitude subjects consistently performed more accurately and more rapidly. In the second experiment, low aptitude subjects again committed more errors, but took significantly less study time than the highs. Analysis of verbal reports showed that the majority of the high aptitude men used higher-order processing or learning strategies, which enabled them to make more accurate matches.

Instructional Strategies for Training Men of High and Low Aptitude, by Hilton M. Bialek, John E. Taylor, and Robert N. Hauke, Technical Report 73-10, 38 pp., April 1973 (SPECTRUM III). AD-760 408

This report deals with research conducted to provide information that can be used to improve training of men of widely differing aptitudes, especially for the Army's high-density combat and combat support Military Occupational Specialties (MOSs). The research involved (a) a series of laboratory studies, using systematic manipulation of learning variables, and (b) a strategy of optimization applied in an operational setting, testing out promising guidelines. As in previous studies, major differences were observed in the performance of high and low aptitude groups, with the greatest differences in tasks making more cognitive demands and the least in tasks using manipulative motor skills. For low aptitude men, arrangements that maximize personal interaction during instruction were generally best. High aptitude men can learn many tasks themselves, given the minimum information, directions, and standards.

STAR—Division No. 5
Aircraft Recognition Training
(Research for the Department of the Army)

Comparison and Evaluation of Printed Programs for Aircraft Recognition, by Elmo E. Miller and Arthur C. Vicory, Technical Report 71-22, 34 pp., October 1971 (STAR III). AD-739 521 ED-054 610

Several printed prototype programs for training visual aircraft recognition were developed and compared experimentally. One program produced an average score of 95% on a printed recognition test (the next closest group test had more than twice as many errors). The program also tended to take the least time to administer (about 15 minutes per aircraft). The training was in three phases. (1) Study of Multi-Image Cards (each showing several views of one aircraft, listing distinctive features), (2) Study of Paired Comparison cards (each showing two or three aircraft that are likely to be confused); (3) Study of Flash Cards (each showing one view of one aircraft—10 different cards for each aircraft). After each phase, tests with printed imagery were administered. The program should be feasible and effective for routine training.

Studies of Aircraft Recognition Training, by Paul G. Whitmore, William C. Ranlin, Robert D. Baldwin, and Sandra Garcia, Technical Report 72-5, 18 pp., February 1972 (STAR I). AD-739 923

The research dealt with three problem areas: selection of the minimum number of views of each aircraft required for effective recognition training, determination of an appropriate exposure duration for test images, and determination of the relative emphasis needed on friendly and hostile aircraft to produce adequate identification performance. The uniformity of performance on a posttraining test was a function of the number and distribution of the views used in training and the similarity level of the aircraft. Differences in duration from one to five seconds were critical only for the most highly similar aircraft. Both friendly and hostile aircraft need to be given equal training emphasis.

STOCK—Division No 1 (System Operations)
Development of Training Management Procedures for Different Ability Groups
(Research for the Department of the Army)

Self-Paced Advanced Individual Training (AIT) and Duty Assignment Procedures, by Harold Hunter and Harold Wagner, Technical Report 73-14, 37 pp., June 1973. AD 764 973

A study was made to (a) describe how self-paced Military Occupational Specialty (MOS) training affects the Army assignment system, (b) identify ways the existing assignment system can accommodate individualized instruction, and (c) suggest modifications to the assignment system to provide better integration of self-paced training with assignment procedures. Information on self-paced systems in the Army, Navy, and Air Force and on assignment policies and procedures at the Department of the Army and at local training bases was collected, through interviews, correspondence, and examination of relevant documents. Relationships between self-paced systems and the assignment system were analyzed to identify points of accommodation.

SYMDESC—Division No. 1 (System Operations)

Development of a General Theoretical Mechanism for Describing Individual Students
(Research for the U.S. Air Force, Human Resources Laboratory)

A Theoretical Basis for Individualized Instruction, by Edward H. Kingsley and John Stelzer, AFHRL-TR-74-10, (HumRRO Technical Report 74-7) 117 pp., April 1974.

This research was designed to formulate a theoretical basis for a model of individualized instruction. The theory is semi axiomatic in nature so that the definitions and assumptions used are stated explicitly. Set theory and symbolic logic are the conceptual tools used. The model includes theories of subject matter structure and student state description. These are related by an overall instructional model. A main result shows how subject-matter structure constrains student state transitions through a subject matter. An application of the subject-matter theory is made to an existing Air Force course. A number of open problems are given whose further investigation would help make the model a more practical instructional tool.

SYNTRAIN—Division No. 6 (Aviation)

Modernization of Synthetic Training in Army Aviation
(Research for the Department of the Army)

Transfer of Instrument Training and the Synthetic Flight Training System, by Paul W. Caro, paper for Fifth Naval Training Device Center and Industry Conference, Orlando, Fla., February 1972, issued as Professional Paper 7-72, 10 pp., March 1972. AD-743 155 ED-062 614

One phase of an innovative flight training program, its development, and initial administration is described in this paper. The operational suitability test activities related to a determination of the transfer of instrument training value of the Army's Synthetic Flight Training System (SFTS) Device 2B21. Sixteen active Army members of an Officer Rotary Wing Aviator Course who had completed primary training and 9 Instructor Pilots participated in the study. Instrument training was conducted in the SFTS on a proficiency basis. Aircraft checkrides were administered by independent evaluator personnel. Checkride times and grades showed that much of the training now conducted in aircraft could be conducted more efficiently on the ground.

Determining Training Device Requirements in Fixed Wing Aviator Training, by Paul W. Caro, Oran B. Jolley, Robert N. Isley, and Robert H. Wright, Technical Report 72-11, 59 pp., April 1972. AD-744 447 ED-064 593

All fixed wing pilot training programs at the U.S. Army Aviation School were studied in FY 1968 to determine whether training might be more effective through more use of synthetic flight training equipment and, if so, to specify main characteristics needed. Secondary objectives were to assist in developing low-cost devices for one course and to determine the probable cost-effectiveness of a commercially available device in another. A method was developed that identified specific and differential needs for synthetic equipment in each course and determined suitability of existing equipment. A generalizable, systematic method for determining requirements for synthetic training equipment in existing training programs resulted.

SYNTRAIN *(Cont.)*

Research on Synthetic Training. Device Evaluation and Training Program Development, by Paul W. Caro, Robert N. Isley, and Oran B. Jolley. Technical Report 73-20, 49 pp., September 1973. (SYNTRAIN II) AD-768 923

Two studies were conducted to evaluate a fixed-wing instrument procedure training device and to develop a training program for use with the device. In the first study, a group of trainees at the U.S. Army Aviation School who received synthetic instrument flight training with the new device were compared with a control group of trainees who did not. Men trained with the new device tended to perform more satisfactorily than the control group. The second study was concerned with development and evaluation of an instrument flight training program designed especially for use with the new device. Results showed a 40% reduction in number of flight hours required to attain the twin-engine transition and instrument flight objectives of the course. It appears that the training concepts used in developing the training program using the training device have application not only to other flight training courses for both fixed and rotary wing aircraft but in other programs utilizing training devices.

"Variables in Transfer of Training. Devices and Programs," by Paul W. Caro and Wallace W. Prophet, paper for Sixth Annual Naval Training Equipment Center and Industry Conference, Man—The Focus of the Training System, Orlando, Florida, November 1973, in Proceedings, NAVTRAEQUIPCEN IH-226, pp. 265-275.

A training device will be only as good as the training program will allow it to be. Instructors and the organization and content of the training programs are, in many respects, becoming more important concerns than the simulators and training aircraft.

"Aircraft Simulators and Pilot Training," by Paul W. Caro, *Human Factors*, vol. 15, no. 6, December 1973; issued as Professional Paper 6-74, 9 pp., May 1974.

Simulators have been less important for training than aircraft, but they are currently emerging as primary pilot training vehicles. This new emphasis is an outgrowth of systems engineering of flight training programs. Programs employing such techniques as functional context training, minimizing over-training, effective utilization of personnel, use of incentive awards, peer training and objective performance measurement have resulted in impressive transfer of training. The conclusion is drawn that a proper training program is essential to realizing the potential training value of a device regardless of its realism.

TESTAID—Division No. 5

Technical Assistance in the Design and Execution of JTF-2 Test 3.1/3.5
(Research for the Department of the Army)

"Tracer Observation for Air Defense Fire Control," by Robert D. Baldwin, *Air Defense Trends*, September 1970; issued as Professional Paper 13-72, 8 pp., May 1972. AD-755 121

Research to evaluate effectiveness of tracer observation as a fire control technique for gun-type air defense weapons is reported. It was found that the machine dynamics of weapon systems are not compatible with the type of dynamics displayed by aircraft in a tactical situation. Several illusions are associated with tracer observations, a gunner has difficulty in localizing a tracer with respect to the target because of limitations of stereoscopic vision and time delays in feedback information from tracers. Controlled firing tests to evaluate usefulness of tracer fire control are needed for various combinations of aircraft and weapon dynamics, and tracer firing frequency.

TRADE–Division No. 1 (System Operations)

A Study of Solid State Equipment Maintenance and Training Requirements
(Research for the Ford Motor Company, Automotive Assembly Division)

"Solid State Equipment Maintenance and Training Requirements, Phase I. Establishing the Data Base," by Robert C. Trexler, Consulting Report CR-D1-72-1, 163 pp., September 1972.

The objective was to establish a data base from which to develop training for electricians in troubleshooting and repair of solid state electronic controlled production line equipments. The work included analysis of equipment failure frequencies and criticalities, repair part support effectiveness histories, determination of electrical and electronic knowledges of employed tradesmen, team composition imposed by equipment, background training and experience. Integrated questionnaires were developed to get data from 20 assembly plants to augment on-site interviews and observations. To define the appropriate mix of skills and knowledges for the training program, a systems analysis of maintenance performance in the division was performed. Specific problems and possible solutions were identified.

TRAINMAN–Division No. 2

Development of an Instructional Program in Training Technology and Training Management
(Research for the Department of the Army)

"Developing Performance Tests for Training Evaluation," by William C. Osborn, Professional Paper 3-73, 8 pp., February 1973, based on paper for CONARC Training Workshop, Fort Gordon, Ga., October 1971. AD-758 436 ED-077 934

This paper describes the major action points in the course of developing a test for training evaluation. The author gives a brief summary of the 14 action points he considers basic for a test developer, from job objectives to final specifications.

"Framework for Performance Testing," by William C. Osborn, *Training in Business and Industry*, vol. 11, no. 5, pp. 28-31, May 1974; based on Professional Paper 3-73.

The major action points in the development of a test for training evaluation are: (1) obtain list of terminal objectives with skill and knowledge requirements, (2) determine criticality of objectives of military mission, (3) determine adequacy of objective, (4) review objective with job/training analyst, (5) determine feasibility of duplicating the objective's conditions and task behavior in a test situation, (6) develop a substitute method of testing, (7) determine number of replications or variations of test behavior necessary for reliable measurement, (8) determine controls on test conditions necessary to insure standardization over trainees, (9) develop objective pass-fail scoring procedure for trainee qualification, (10) develop diagnostic scoring procedures for training evaluation, (11) prepare detailed instructions for tester, trainee, and scorer, (12) determine feasibility of testing on all terminal objectives, (13) determine a relevant sample of test items for inclusion in test, (14) prepare final specifications for test administration.

TYPETRAIN—Division No. 3

Development of Improved Army Typing Training Program and Materials
(Research for the Department of the Army)

An Evaluation of Alternative Programs for Training Beginning Typists in the Army, by Morris Showel, Technical Report 72-33, 106 pp., November 1972. AD-755 501; ED-070 922

This report presents the results of research to develop an improved training program for Army typists, and the material needed to implement that program. The research was conducted at Fort Ord and Fort Knox. First, baseline learning curves were determined. Eight experimental programs then were examined, and the results of various modifications in training were compared with the baseline learning curves. The effect of selected training variables and training systems was evaluated, and the relationship between straight-copy typing and production-copy typing was explored. Several alternative revised training program. were field tested, and suggestions for revising the training program now in use were made.

"A Comparison of Alternative Media for Teaching Beginning Typists," by Morris Showel, *Journal of Educational Research*, vol. 67, no. 6, February 1974, pp. 279-285.

Eight different training programs involving a variety of media were evaluated in terms of their effectiveness in developing the straight copy typing skill of male military personnel who typed 10 or less words per minute on a screening test given prior to the start of training. Subjects received a maximum of 33 hours of typing practice over a 9-day period, and tests to measure progress were administered after 1 hour of practice and after every 3 3/4 hours of practice thereafter. The results indicate that the most effective programs tended to be those which devoted relatively little time to detailed instruction during keyboard learning and emphasized speed by forced pace typing during skill building.

UNCLE—Division No. 7 (Social Science)

Research Studies and Analyses on Procurement, Utilization Performance, Retention and Separation of Military Personnel
(Research for the Office of the Assistant Secretary of Defense, Manpower and Reserve Affairs)

"Use of Automated Data Files in Manpower Research," by Eli S. Flyer and Kenneth C. Scheflen, presented at the *25th* Military Operations Research Symposium, Monterey, California, November 1973.

The Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs) through its Manpower Research and Data Analysis Center (MARDAC) extracts data from Defense and agency magnetic tape personnel files. After editing and file linking procedures, many files are combined and compressed. This paper shows how selected data elements from different files can be manipulated to provide Defense management with information on manpower programs and policies.

UPGRADE—Division No. 6

Improving Aviation Maintenance Training Through Task and Instructional Analysis
(Research for the Department of the Army)

UH 1 Helicopter Mechanic (MOS 67N20) Job Description Survey. Background, Training, and General Maintenance Activities, by Russel E. Schulz, Barbara K. FitzGerald, and Wallace W. Prophet, Technical Report 73-33, 198 pp., December 1973. AD-775 390

This report describes the planning, conduct, analysis, and results of a worldwide survey of the maintenance activities of over 5,000 UH-1 helicopter mechanics, MOS 67N20. It describes methods and techniques used in developing the survey questionnaire and a job description inventory covering more than 1,100 helicopter maintenance tasks, administration of the survey by mail and by research teams in the field, and extraction and analysis of survey results. The report provides a broad profile of UH-1 maintenance personnel, their training and background, and a description of the UH-1 mechanic's general job activities. Data concerning performance of the 1,400+ maintenance tasks are presented in a companion report.

UTILITY—Division No. 3

Study of Men in Lower Mental Categories. Job Performance and the Identification of Potentially Successful and Potentially Unsuccessful Men
(Research for the Department of the Army)

Performance in Four Army Jobs by Men at Different Aptitude (AFQT) Levels. 3. The Relationship of AFQT and Job Experience to Job Performance, by Robert Vineberg and Elaine N. Taylor, Technical Report 72-22, 144 pp., August 1972. AD-750 603 ED-072 110

To provide information on performance and characteristics of effective and ineffective marginal personnel in the Army, a study has been made of approximately 1500 men with experience ranging up to 20 years in four different Army MOSs. The study included a group of men with Armed Forces Qualification Test scores in the marginal range and a comparison group of men in the same jobs, but in the upper AFQT levels. This report, the third in a series, describes the bulk of the major study findings including comparisons of the performance of men in different mental categories with different amounts of job experience, comparisons of the performance of special subgroups (Negroes and Caucasians, inductees and enlistees, and men with formal and on-the-job training), an analysis and definition of acceptable performance, and a procedure for using Job Knowledge tests to screen ineffective performers.

Performance in Four Army Jobs by Men at Different Aptitude (AFQT) Levels. 4. Relationships Between Performance Criteria, by Robert Vineberg and Elaine N. Taylor, Technical Report 72-23, 35 pp., August 1972. AD-750 604

A study was made of approximately 1800 men with experience ranging to 20 years in five different Army MOSs to provide information about the performance and characteristics of effective and ineffective marginal personnel in the Army. The study included a group of men with Armed Forces Qualification Test scores (AFQT) in the marginal range and a comparison group of men in the same jobs, but in the upper range of AFQT scores. Performance was measured by intensive job sample tests, job knowledge tests, and supervisor ratings. Biographical questionnaires, a battery of published and experimental tests, and Army records provided information about background, personal characteristics, and military experiences. This report, the fourth in a series presenting the extensive data and analyses, examines the determinants of job behavior and describes the relationships among the three performance criteria used in the study: job sample tests, job knowledge tests, and supervisor ratings.

"The Interchangeability of Job Sample Tests and Job Knowledge Tests in Four Army Jobs," by Robert Vineberg and Elaine N. Taylor, paper for American Psychological Association Convention, Honolulu, Hawaii, September 1972.

Extensive job sample tests and multiple choice job knowledge tests were administered to approximately 370 men in each of four Army jobs: Armor Crewman, Repairman, Supply Specialist, and Cook. Representative tasks in each job were analyzed and skill requirements were identified. This analysis and the correlations between job sample scores and job knowledge scores supported the proposition that knowledge tests are valid for measuring proficiency in jobs where skill components are minimal and where knowledge tests are carefully constructed to measure only information that is directly relevant to the performance of that job.

VETS—Division No. 7 (Social Science)

Statistical Evaluation of the Veterans Outreach Program and Process Description
(Research for the National League of Cities and U.S. Conference of Mayors)

Evaluation of the Veterans' Education and Training Service (VETS) Program of the National League of Cities and U.S. Conference of Mayors, by Kenneth C. Scheflen and Robert J. Brandewie, Technical Report 73-31, 99 pp., December 1973. PB-226 895

The objective of the Veterans' Education and Training Service (VETS) program conducted by the National League of Cities/U.S. Conference of Mayors is to enroll educationally and economically disadvantaged veterans in Veterans Administration education and training programs. Methodology was developed to measure the changes in G.I. Bill utilization by various population subgroups in 11 target cities and 11 control cities, using computerized data files provided by the Veterans Administration and the Department of Defense. Through on-site interviews and the administration of mail questionnaires, data were collected on the size, organizational affiliation, and goals of VETS projects. The most effective VETS programs appear to be those with strong ties to local governmental agencies providing a variety of services; the least successful are those affiliated with colleges and universities.

VOLAR—Division No. 3

Support of the Army's Field Experimentation of Service Attractiveness and Training Programs
(Research for the Department of the Army)

"The Experimental Volunteer Army Training Program, A Pictorial Report," Research Product, January 1972.

This pictorial report provides a brief explanation of the HumRRO effort in developing and evaluating an Experimental Volunteer Army Training Program (EVATP). A performance-oriented system designed to minimize the learning lag caused by individual differences found in any large group of learners was developed. Under this concept, all trainees are challenged; the slow learners and those with language barriers succeed, and those with high aptitude have ample opportunity to progress rapidly while being provided the incentive of helping fellow students. The emphasis is on each individual learning those specific skills and knowledges he will actually need to perform a task. Each man must perform each skill in such a manner as to show complete mastery before he passes on to another facet of instruction.

The Concepts of Performance-Oriented Instruction Used in Developing the Experimental Volunteer Army Training Program, by John E. Taylor, Eugene R. Michaels, and Mark F. Brennan, Technical Report 72-7, 62 pp., March 1972. AD-743 851 ED-064 588

This report describes the planning and implementing of the Experimental Volunteer Army Training Program (EVATP) at Fort Ord early in 1971. This was the Army's first effort to effect major training innovations in the conversion toward an all-volunteer Army. By the fall of 1971, this program was being used as a model for implementing the EVATP at other Army Training Centers. In developing the EVATP system, six established learning principles were applied to Basic Combat Training and Advanced Individual Training to modify the conventional training system. Course objectives and performance tests used were developed jointly by Fort Ord and HumRRO. In a comparison with a conventionally trained group, independently conducted by the Infantry School at Fort Benning, EVATP graduates performed significantly better on five out of seven BCT subjects, and seven out of nine AIT subjects. In general, these gains were shown by men at all levels of aptitude.

Summary and Review of Studies of the VOLAR Experiment, 1971. Installation Reports for Forts Benning, Bragg, Carson, and Ord, and HumRRO Permanent Party Studies, by Robert Vineberg and Elaine N. Taylor, Technical Report 72-18, 106 pp., May 1972. AD-744 449 ED-068 742

One purpose of Project VOLAR, a field experiment conducted during FY 1971 as part of the Modern Volunteer Army (MVA) program, was to evaluate the effects of VOLAR innovations on attitudes toward the Army and the Army career intentions of officers and enlisted men. This report provides an evaluative summary and consolidation of findings in several studies that focused upon permanent party officer and enlisted personnel. It encompasses (a) evaluations conducted by each VOLAR installation—Forts Benning, Bragg, Carson, and Ord—and described in their post reports, and (b) the HumRRO studies of permanent party personnel at Forts Benning, Carson, Jackson, Knox, and Bragg and at three installations in USAREUR, and of an Army-wide sample. Recommendations for future action are made, based on findings concerning conditions that appear to be important to men in making the Army a more satisfactory place in which to work and live.

Attitudinal Studies of the VOLAR Experiment. Permanent Party Personnel, 1971, by S. James Goffard, James S. DeGracie, and Robert Vineberg, Technical Report 72-25, 228 pp., August 1972. AD-752 103

One purpose of Project VOLAR, a field experiment conducted during FY 1971 as part of the Modern Volunteer Army (MVA) program, was to evaluate the effects of VOLAR innovations on attitudes toward the Army and Army career intentions of officers and enlisted men. In this report, data are discussed from questionnaires administered to random samples of permanent party officers and enlisted men (a) at Forts Ord, Jackson, Benning, Carson, and Knox; (b) at Fort Bragg and three posts in USAREUR, and (c) in an Army-wide (except Southeast Asia) sample. The questionnaires covered backgrounds, attitudes, plans for the future, and evaluations of possible VOLAR innovations. The analyses of the data are discussed.

"Need Functioning at Four Stages in Military Service," by Elaine N. Taylor, Robert Vineberg, S. James Goffard, and James S. DeGracie, paper for American Psychological Association Convention, Honolulu, Hawaii, September 1972

Changes and constancies in the importance of 57 situations and conditions in four stages of Army life are presented and interpreted following Maslow's analysis of the functioning of human needs. Ratings of importance were transformed to z-scores and plotted. Three patterns were observed. It is suggested that, (a) items remain stable because other prepotent needs are less well satisfied, (b) items decrease in importance because they are being met to some degree or they were overestimated initially, (c) items increase in importance because they have been satisfied over a long time and are initially underestimated.

VOLAR *(Cont.)*

Attitudinal Studies of the VOLAR Experiment. Men in Training, 1971, by S. James Goffard, James S. DeGracie, and Robert Vineberg, Technical Report 72-31, 162 pp., October 1972. AD-753 599

One purpose of Project VOLAR, a field experiment conducted during FY 1971 as part of the Modern Volunteer Army (MVA) program, was to evaluate the effects of innovations under the program. In this report, data are discussed from the three questionnaires -VOLAR I, II, and III—that were administered to men during BCT and AIT at two posts (Forts Ord and Jackson). Included are substudies of (a) attitudes and absenteeism, (b) attitudes of a Midwestern sample, and (c) attitudinal effects of acceleration in the BCT cycle at Fort Jackson.

Attitudinal Studies of the VOLAR Experiment. A Longitudinal Study, 1971-72, by S. James Goffard, James S. DeGracie, and Robert Vineberg, Technical Report 73-6, 23 pp., March 1973. AD-758 873

One purpose of Project VOLAR, a field experiment conducted during FY 1971 as part of the Modern Volunteer Army (MVA) program, was to evaluate the effects of VOLAR innovations on attitudes toward the Army and Army career intentions of officers and enlisted men. A longitudinal study was conducted to determine whether the attitudes and reactions of men stationed at posts where programs of VOLAR innovations were continued on into 1972 were influenced by the presence or absence of VOLAR 71 programs at their previous duty or training station. The sample finally studied consisted of men who had taken one or more questionnaires while they were in training at either Ford Ord (a VOLAR training post) or Fort Jackson (a non-VOLAR training post) sometime between January and June 1971, and were stationed at either Fort Bragg or Fort Benning in December 1971, when they took a final questionnaire.

WIN I—Division No. 3

Analyses of WIN Team Functioning and Job Requirements
(Research for the Department of Labor, Manpower Administration)

Analyses of WIN Team Functioning and Job Requirements- Phase I: Duties and Tasks Performed by Teams and Team Members, by Richard P. Kern and John S. Caylor, Technical Report 71-19, 120 pp., August 1971. PB-202 811 ED-062 562

The team staffing patterns and the experience, education, and training backgrounds of the staffs of 51 WIN teams are described. Current team functioning is described for these teams in terms of how they proportion their time over the major duty areas identified in the Job Activities Inventory developed for this study. In addition, performance of each of the five basic team member positions is described in terms of how each proportions time over the duties and tasks performed. Performance of the respondents of each of these basic team member positions in tasks directly involved in caseload decision making is identified.

Analyses of WIN Team Functioning and Job Requirements, Final Report—Duties Performed and Style of Functioning, in Relation to Team Effectiveness, by Richard P. Kern, Technical Report 72-12, 151 pp., April 1972. PB-210 463

Data collected from WIN Employability Development Teams were used to describe team functioning in terms of two major variables: style of functioning in arriving at client-oriented decisions, and in extent to which distribution of job duty effort among team members emphasizes duty area specialization by job position title. Data were analyzed for relationships between team experience, training, and staffing characteristics and the two style of functioning variables; relationships between the two style of functioning variables and criteria of accomplishment of team communication and coordination objectives and criteria of accomplishment of program services and successful enrollee outcome. Recommendations are made regarding team staffing and in-service training based upon data presented in this report and the preceding Phase 1 report.

WIN II—Division No. 2

Development of Guidelines for the WIN Orientation Program with Emphasis on Training in Vocational Assessment

(Research for the Department of Labor, Manpower Administration)

Development of a Program of Instruction for WIN Employability Orientation, by William C. Osborn, G. Gary Boycan, and Donald F. Haggard, Technical Report 72-3, 180 pp., February 1972. PB-210 090 ED-060 442

This report describes the development of a flexible model program of instruction that included curriculum elements, training objectives, instructional methods and procedures, and measures for evaluating both individual trainee needs and training achievement of Work Incentive Orientation Training. The research is part of an effort to prepare unemployed people for job entry. The instructional program covers 18 major areas of employability orientation, a small study of the effectiveness of training in one of the areas—vocational assessment—is reported herein.

An Instructional Program for Employability Orientation, by William C. Osborn, Donald F. Haggard, G Gary Boycan, Ronald W. Spangenberg, John D. Engel, and Willard H. Pratt, Technical Report 72-4, 306 pp., February 1972. PB-207 395 ED-064 491

In the research reported here, specific guidelines that were developed for a national WIN (Work Incentive Program) orientation program are described. Included are enrollee training objectives, an outline of suggested course content for 18 modules of relevant areas of skills and knowledges, tests of enrollee performance, and recommended methods of presenting various subject matters. There are also extensive lists of references and sources of information to aid instructors in preparing lesson plans and courses.

YOUTH SURVEY—Division No. 7 (Social Science)

Attitudes of Youth Toward Military Service

(Research for the Office of the Assistant Secretary of Defense, Manpower and Reserve Affairs)

Attitudes of Youth Toward Military Service. Results of National Surveys Conducted in May 1971, November 1971, and June 1972, by Allan H. Fisher, Jr., OASD(M&RA)MR-72-2, August 1972 (Consulting Report CR-D7-72-30, August 1972).

This survey studies the enlistment motivation and attitudes toward employment and education held by American youth. The study samples were each drawn from a national probability sample of youth composed of a master primary sample of resident college students, a master sample of the general population, and a special high school sample. Results from the surveys revealed that the most important occupational goals for youth were pay and secure/steady employment. There was evidence of continued improvement in the attitudes of youth toward military service in the June 1972 survey, compared with the previous surveys. In the three surveys, over 80% of American youth endorsed the all-volunteer military service.

EXPLORATORY RESEARCH

(Research for the Department of the Army)

Exploratory Research 79—Division No. 1 (System Operations)
Reducing Errors in Logistics ADP

Reduction of Problems in Implementing and Utilizing Automatic Data Processing Systems in Logistics, by Francis L. Hibbits and C. Dennis Fink, Technical Report 72-27, 86 pp., October 1972. AD-905 207L

This exploratory research studied the factors that cause high error rate in ADP logistics systems in the Army in the field and explored the feasibility of conducting research that would attempt to identify and to remove the impact of those factors which seem to be associated with high error rates. The implementation of the (DLOGS) Class IX Repair Parts Supply System in the 24th Infantry Division (Fort Riley, Kansas) was used as the vehicle for field analysis. Data were collected by interview and questionnaires from division personnel involved in the system implementation and operation. A literature search was made, and relevant research projects and directives were reviewed.

Exploratory Research 83—Division No. 5
GED Program for the Army

Relationship of Education Level to Capabilities and Attitudes of Young Enlisted Men, by William H. Melching, David Orme-Johnson, Paul G. Whitmore, and William J. Given, Technical Report 72-29, 31 pp., October 1972. AD-753 597

To obtain information about problems of adaptation common to undereducated men, and to obtain information about knowledges and skills such men may not have, an achievement test/attitude questionnaire was administered to a large group of enlisted men. The instrument was designed to assess men's attitudes and skills with respect to financial, health, insurance, legal, and interpersonal problems. Men who took the test ranged in education level from less than 8 years to over 16 years. Higher educated men performed significantly better on the achievement test than did lower educated men, but high school dropouts (education level 9-11 years) consistently scored lowest of all. When attitude scale items were categorized as reflecting good vs. poor attitudes, poor attitudes decreased as education level rose. The results showed a strong correlation between errors on the achievement test and percentage of poor attitudes.

Exploratory Research 84—Division No. 6
Retention of Army Flying Skills

Retention of Flying Skills and Refresher Training Requirements. Effects of Nonflying and Proficiency Flying, by Robert H. Wright, Technical Report 73-32, 70 pp., December 1973. AD-774 853 ED-089 077

A questionnaire survey was conducted of Army aviators who had experienced extended periods of nonflying or of flying only the minimum number of hours required by Army regulations to maintain proficiency, in order to determine the loss of flying ability experienced and the refresher training required for combat readiness. Analysis of the data obtained indicated that flight excusal followed by refresher training would provide operational units with better qualified aviators at less cost than the traditional flying program. A proficiency maintenance program based on very low-cost synthetic training devices seems to be the only alternative that might be less costly than excusal plus refresher training, but feasibility of these devices in the Army context is unknown at this time.

Exploratory Research 88—Division No. 4[1]
Countermine and Boobytrap Training

A Study of Factors Affecting Mine and Boobytrap Detection. Subject Variables and Operational Considerations, by Jeffery L. Maxey and George J. Magner, Technical Report 73-12, 44 pp., June 1973. AD-769 635 ED-081 904

Tests were administered to and interviews conducted with military personnel identified as expert mine and boobytrap detectors, in exploratory research designed to develop methodology for identifying the characteristics of and describing the techniques used by such personnel. Only two of the psychological, ability, aptitude, and interest variables studied were significantly related to rated expertise in detection, so these variables may not play an important role in detection performance. None of the background information variables had any apparent relationship to expertise. Identifying highly proficient detectors on the basis of non-experiential variables is not likely to be successful, but it may be possible to identify these individuals on the basis of experience-oriented data.

Exploratory Research 91—Western Division (TX)
Improving the Effectiveness of Army Instructors

A Model of the Functions of a Master Instructor, by William H. Melching and Paul G. Whitmore, Technical Report 73-23, 33 pp., October 1973. AD-772 991

After a search of educational and training literature, and a review of practices and criteria employed by Army schools in evaluating instructors, a model of the functions of a master instructor was developed. Based upon two main rationales (systems engineering and a behavioristic concept of learning), the model encompassed four areas of performance, apportioned into 17 functions and 10 tasks. Task statements were phrased in the form of instructor performance objectives. The model can provide guidance in the development of prototype procedures and materials for the training of instructors, and it can aid in devising procedures and forms for the evaluation of instructors

[1] Work Unit COUNTERMINE was initiated as a result of ER-88.

BASIC RESEARCH STUDIES

(Research for the Department of the Army)

Basic Research 14—Western Division (TX)
Prompting and Guidance in Training

"How to Make a Training Film That Really Works," by Elmo Miller, *Training in Business and Industry*, pp. 26-31, January 1974 (based on TR 71-12, *Comparison of Pictorial Techniques for Guiding Performance During Training).*

One revision of a training film, after testing it on novice learners, has proven necessary for an effective film. When a film section is difficult for trainees, trouble lies in one of these areas: actor's performance, camera viewpoint, animation, sound cues, photographic technique, language problems, or organization.

Basic Research 16—Division No. 5
Improving Ability to See Military Targets

"Perceptual Style and Detection of Motion in Depth," by William H. Ton, *Perceptual and Motor Skills*, vol. 34, 1972, pp. 423-428; issued as Professional Paper 9-72, 8 pp., April 1972. AD-743 275

Data reported indicate persistent individual differences in the detection of motion in depth—whether an object is approaching or receding. This finding stimulated the hypothesis that 'perceptual style' might be the source of at least some of this variance, particularly as regards the detection of slowly moving or distant objects. In a test of this hypothesis, the findings did not yield a significant interaction of perceptual style with rate of movement. However, there was a difference ($p < .12$) in detection times between the two groups who differed with regard to perceptual style. It was hypothesized that this was due to a cautious, slow approach to detection tasks on the part of field-dependent individuals.

"Rate of Apparent Magnification as a Cue to Distance. Laboratory Investigation," by William H. Ton, *Perceptual and Motor Skills*, vol. 35, 1972, pp. 283-288, issued as Professional Paper 19-72, August 1972. AD-755 599

A laboratory study was conducted to determine the extent to which an observer can use magnification of an unknown object as a reliable cue to its range or distance. "Perceptual style" was used as a source of variance. It was concluded that, when both initial sizes and high and low velocity were presented, size alone was used to determine judgment of distance, although rate of magnification as a primary cue to distance cannot be eliminated on the basis of the present experiment.

Capabilities of Ground Observers to Locate, Recognize, and Estimate Distance of Low-Flying Aircraft, by Robert D. Baldwin, Technical Report 73-8, 50 pp., March 1973 (BR-16). AD-758 875

A considerable amount of research has been conducted during the past 10 years concerning the abilities of ground observers to detect, recognize, and estimate the range of aircraft. This report integrates and evaluates the results of 20 technical reports concerning these abilities. The effects on visual detection and recognition of visual aids, search sectors, target altitudes, and search methods are discussed. The techniques used for training in aircraft recognition are reviewed for historical origins and research validity. The accuracy of ground-to-air range estimation is described for unaided and stadimetric (size-distance) methods. Techniques of training range estimation in miniaturized situations are described. The influence of environmental factors on estimation accuracy is examined.

Basic Research 16 *(Cont.)*

Research on Stadimetric Ranging. Visually Matching the Apparent Size of Objects, by Robert D. Baldwin, Technical Report 73-27, 22 pp., November 1973. AD-772 994

Five experimental tasks were devised that simulated a stadimetric ranging task requiring observers to estimate when air defense open- and cease-fire events should occur when engaging inbound and outbound aircraft. The laboratory tasks varied the location of the stadimetric aid with respect to the target's location. The results indicated that accuracy and bias (differential error for inbound and outbound judgments) in the perceptual judgments were affected by the location of the size-judgment aid. Individual differences in accuracy were not consistent from task to task. Variation in visual acuity was related to perceptual errors for some tasks. Variation in reaction time was not correlated with perceptual errors.

Basic Research 19—Division No. 6
Definition of Learning Variables

"The Complex Intellect vs. the I.Q. Test as a Predictor of Performance," by James W. Dees, paper presented at Mid South Educational Research Association meeting, New Orleans, November 1972. ED-072 102

Officer candidates at Fort Benning, Ga., participated in a battery of 37 tests to determine the impact of J.P. Guilford's structure of the intellect on skills not usually associated with intelligence. A psychomotor skill, a measure of perseverance, and a measure of leadership ability were selected as criteria on which multiple regressions were conducted. Results showed that, in contrast to general intelligence tests, multiple regressions based on tests of intellectual factors are successful in predicting non-academic performance.

TECHNICAL ADVISORY SERVICE

(Research for the Department of the Army)

Development and Evaluation of a Pre-School Study Manual for Drill Sergeant Candidates, by William C. Osborn and Ronald E. Kraemer, Consulting Report CR-D2-71-5, August 1971; issued as Professional Paper 5-74, 15 pp., April 1974. (Div. 2) AD-780 689

Research was conducted to develop and evaluate study materials that would help prospective Drill Sergeant candidates prepare for Drill Sergeant school. A Study Manual containing relevant readings, study objectives, and self-tests was prepared. Diagnostic exams were developed and used to evaluate the achievement of a class of Drill Sergeant candidates who used the manual in their pre-school study program. Results showed that men using the manual demonstrated only slightly higher learning than those who did not use it. Failure to study may be the cause, which suggests that low motivation may be a problem. The report suggests allowing the men more time for monitored study, establishing a minimum qualifying score for entry to the school, and using the Diagnostic Exams to screen potential candidates.

"Target Detection in the Field," by Jeffery L. Maxey and James A. Caviness, paper for 79th annual meeting of American Psychological Association, Washington, D.C., September 1971; issued as Professional Paper 11-72 , pp., May 1972. (Div. 4) AD-742 158

A factorial experiment was designed to determine (a) whether a negative exponential target detection model was adequate for describing the detection of moving human targets by stationary observers, and (b) whether the observer's detection behavior was affected by target speed, target-to-observer range, or the terrain in which the target appeared. Ninety Army enlisted men detected moving human targets in three different types of terrain. Analysis showed that the negative exponential model did not adequately describe the men's detection behavior, but that target speed, target-to-observer range, and the terrain in which the target appeared significantly affected their detection times.

Target Detection and Range Estimation, by James A. Caviness, Jeffery L Maxey, and James H. McPherson, Technical Report 72-34, 41 pp., November 1972. (Div. 4) AD-753 600

A study of target detection times for human targets in various field situations was conducted to obtain data for the Army Small Arms Requirements Study (ASARS). Three significant variables—terrain complexity, target speed, and target distance—and two randomized control variables (direction of movement and starting position) were studied. Results indicate that terrain complexity and target range were positively related to detection time; target speed was negatively related. Examination of the 24 detection-time distributions suggests that the underlying probability distribution for the detection-time distributions was not exponential in form.

Relationship Between Recognition Range and the Size, Aspect Angle, and Color of Aircraft, by Robert D. Baldwin, Technical Report 73-2, 18 pp., February 1973. (Div. 5) AD-758 870

Reduced-scale field tests were conducted using 1/72nd scale model aircraft to estimate the relationship between aircraft size (presented area) and recognition range by ground observers equipped with binoculars. The overall size, color, and aspect angle (view) of the models were varied. The observers were highly trained and well-motivated members of the military and civilian research staff. The average recognition ranges and accuracy levels obtained far exceeded previously published data, being in the realm of detection ranges. The dar . grey models having a reflectance similar to camouflaged aircraft were recognized 1900 meters (full-scale) sooner than aluminum-colored models. Aspect angles affected recognition range, as did overall size. Trial-to-trial reliability was high for each view, but there was little consistency in the recognition ranges between different views.

GENERAL

Psychology in the Real World. A Perspective on Psychotechnology Today and Ten Years Hence, by William A. McClelland, Professional Paper 3-72, 9 pp., February 1972, based on paper for symposium at American Psychological Association convention, Miami Beach, Fla., September 1970. (Exec. Off.) AD-743 153

The pace of technological change, its impact and influence on human behavior, and predictions as to the state of psychotechnology in 1980 are discussed. The author deals with contributions of behavioral scientists working in military and industrial settings toward solving societal problems. Topics emphasized include the technology of teaching and learning, organizational processes and the design of organizations, and psychotechnology and public policy.

The General Concept of Managing for Educational Accountability by John E. Taylor and Robert G. Smith, Jr., Professional Paper 1-72, 8 pp., February 1972, based on paper for Western Regional Research Coordinating Unit Directors Conference, Squaw Valley, Calif., September 1970. (Div. 3 and Exec. Off.) AD-743 154 ED-066 789

The first section of the paper defines project accountability, presents background to the concept, and highlights current problems in the public school system. The paper is also concerned with assessment procedures that make provisions for accountability in (a) attainment of terminal objectives and (b) phase-by-phase conduct of a project in pursuit of terminal objectives.

"Research in Military Training," by Meredith P. Crawford, in the *Encyclopedia of Education*, Crowell-Collier, vol. 6, 1971.

In more than 20 years of research and development for the Army, HumRRO found that training provided the most effective approach for attacking problems of motivation, morale, and leadership as well as those of instructional method and content. Much of the research has been concentrated on ways of improving individual performance, but considerable work has also been done on unit training, training for command and control, language and area training, training technology, and training management.

"System Concept in Education," by Robert G. Smith, Jr., in the *Encyclopedia of Education*, Crowell-Collier, vol. 8, 1971.

The system concept requires a clear statement of purpose and a proper integration of the system components to accomplish purposes efficiently. System development generally occurs in six stages: delineate purposes, identify constraints, identify functions, select components to carry out functions, assemble the system, measure to see whether the purposes have been accomplished. An instructional system is an integrated set of media, equipment, methods, and personnel performing functions to accomplish learning objectives.

"The Future for Education and Educational Technology. What Is the Question?," by Robert J. Seidel, *Educational Technology*, vol. XI, no. 7, July 1971, pp. 37-38, also in *Education Tomorrow*, vol. 1, no. 2, December 1971.

The author presents the possibility that it is not education that has failed but societal characteristics surrounding the educational system.

[1] Items in this section either are not directly related to specific elements of the research program, or are related to several elements.

"Individualized Training and the Training of Individuals," by William A. McClelland, paper for XVIIth International Congress of the International Association of Applied Psychology, Liege, Belgium, July 1971, issued as Professional Paper 24-71, 10 pp., December 1971. (Exec. Off.) AD-743 151

Two current instructional research efforts relating to the problem of an individual student's learning and personal needs are reported. Characteristics of individualized instruction (e.g., terminal course objectives, remedial materials, measurement procedures), administrative constraints (e.g., fixed time, cost of equipment, lack of skilled instructors), training strategies and goals are discussed. The APSTRAT research involves peer instruction and provides for self-pacing, rapid feedback, and practice. Project IMPACT is an effort to provide the U.S. Army with an effective, efficient, and economical computer-administered instructional system.

Performance Measurement in Helicopter Training and Operations, by Wallace W. Prophet, paper for American Psychological Association convention, Washington, D.C., September 1971, issued as Professional Paper 10-72, 15 pp., April 1972. (Div. 6) AD-743 157 ED-064 576

For almost 15 years, HumRRO Division No. 6 has conducted an active research program on techniques for measuring the flight performance of helicopter trainees and pilots. This program addressed both the elemental aspects of flying (i.e., maneuvers) and the mission- or goal-oriented aspects. A variety of approaches has been investigated, with the stress on nonautomated techniques feasible for operational use. This paper describes the work and illustrates its application to and implications for training management, quality control, manpower resources management, and operational capability. Automated human performance monitoring in flight simulators and its implications for automated training is also described.

"Army Training and Education in the '70s," by Howard H. McFann, paper for 17th Annual Army Human Factors R&D Conference, Fort Bragg, N.C., November 1971. (Div. 3)

This paper discusses occupational or MOS training at the individual training level, and the need for training personnel to be versed in existing instructional technology encompassing three general areas. (a) training content, (b) evaluation, and (c) the instructional system. Army trends and changes in the 70s will include an increased emphasis on developing and applying a technology for improving the evaluation of Unit performance, and the use of Units for aiding in worldwide civilian disasters and emergencies. There will be three kinds of educational activity: (a) for those who need it, remedial work in basic literacy skills, (b) development training; and (c) educational programs designed to further the attractiveness of the service.

"Some Current Issues in the Design of Flight Training Devices," by Wallace W. Prophet, Paul W. Caro, and Eugene R. Hall, 25th Anniversary *Commemorative Technical Journal*, November 1971, Naval Training Device Center, Department of the Navy, issued as Professional Paper 5-72, 11 pp., March 1972. (Div. 6) AD-743 270 ED-064 893

This paper develops the rationale that training equipment should be selected or designed to furnish what the student needs to know and to be able to do to perform successfully on the operational job. Several considerations relevant to training equipment design from the systems engineering standpoint are examined. Suggested design features based upon particular student learning needs and on student learning characteristics are presented. Training equipment design features for particular categories of training objectives and for levels of training (e.g., initial training of aviators vs. transition training) are considered. Also discussed is the criticality of the synthetic training program with respect to the total training engineering process.

"Structural Coherence in Pictorial and Verbal Displays," by Ronald W. Spangenberg, *Journal of Educational Psychology*, vol. 62, no. 6, December 1971; issued as Professional Paper 2-72, 9 pp., January 1972. (Div. 2) AD-743 273

The effects of three levels of structural coherence within verbal and pictorial displays were examined. A nonsense syllable was associated with each item as the initial task, the second task was to learn 20 sentences successively presented on a memory drum. Initial learning showed significant superiority of pictorial over verbal groups. Initial learning of displays showing overall structural coherence provided significant improvement in learning the transfer task, as did initial learning of pictorial displays. These results relate both to the design of instructional displays and inferences concerning mental operations.

"Voluntary Inhibition of Galvanic Skin Response," by William H. Ton and John R. Boulger, *Psychological Reports*, vol. 29, 1971, pp. 603-606, issued as Professional Paper 23-71, 6 pp., December 1971. (Div. 5) AD-713 272

An experiment was designed to assess the effectiveness of instructional set in voluntary inhibition of Galvanic Skin Response (GSR). Male subjects were assigned three treatment groups, each of which treated the problem under different instructions. Analyses of suppression are given.

"Informal Education With Instructional Systems?" by Felix F. Kopstein and Robert J. Seidel, *Educational Technology*, vol. 11, no. 1, January 1972, pp. 35-39.

Although social institutions are changing, the realities of human learning are not. Technology does not have to be rejected in informal education. The author discusses the characteristics and definitions of informal education.

"'If It Exists, It Can Be Measured' But How?" by Eugene A. Cogan, paper for New York University First National Annual Training in Business and Industry Conference, New York City, March 1972. (Exec. Off.), included in Professional Paper 16-72, July 1972 (ED-069 736), also printed in *SRIS*, Summer 1973.

In making a job performance evaluation, anything that can be specifically defined can be measured. However, to develop a testing program that is both useful and cost-effective, it must be known who will make what decisions, using the obtained measurements. Analysis and interpretation of the particular purpose and setting are needed. Feedback data show how improved decisions can produce dollar gains far beyond the cost of developing and employing measurement.

"...easuring Effectiveness. Quality Control of Training," by J. Daniel Lyons, paper for New York University First National Annual Training in Business and Industry Conference, New York City, March 1972. (Div. 1); included in Professional Paper 16-72, July 1972. (ED-069 736).

In this paper, the essential elements of a quality control system are illustrated, including (a) training objectives or performance requirements, (b) proficiency and diagnostic measures, (c) data reduction and analysis, (d) procedures for decision and corrective action, (e) communication procedures, and (f) managerial support. It is shown that training goals must be defined in terms of measurable on-the-job performance.

"The Problems of Using Systems Approach in General Education," by Eugene R. Michaels, paper for California Association for Educational Media and Technology (CAIT) Convention, San Diego, Calif., March 1972. (Div. 3)

This paper discusses three preconditions for successful use of the systems approach in education. (1) there needs to be some objective and empirical means of deriving the goals of instruction; (2) the methods used to teach must be opened to fundamental reorganization so that full use can be made of the possibilities of all instructional media, (3) the objectives of an instructional system should be such that they can be realized within a relatively short time -weeks or months, rather than years.

Frameworks for Measurement and Quality Control, Professional Paper 16-72, 15 pp., July 1972, based upon presentation at the New York University First National Annual Training in Business and Industry Conference, New York, March 1972, paper by Eugene A. Cogan, "'If It Exists, It Can Be Measured' But How?" and paper by J. Daniel Lyons, "Measuring Effectiveness. Quality Control of Training." ED-069 736

The author of the first paper states that, in making a job performance evaluation, anything that can be specifically defined can be measured. However, to develop a testing program that is both useful and cost-effective, it must be known who will make what decisions, using the obtained measurements. Analysis and interpretation of the particular purpose and setting are needed. Feedback data show how improved decisions can produce dollar gains far beyond the cost of developing and employing measurement. In the second paper, the essential elements of a quality control system are illustrated, including (a) training objectives or performance requirements, (b) proficiency and diagnostic measures, (c) data reduction and analysis, (d) procedures for decision and corrective action, (e) communication procedures, and (f) managerial support. It is shown that training goals must be defined in terms of measurable on-the-job performance.

"Educational Technology Reviews. *Computers in Undergraduate Science Education*," by Robert J. Seidel, *Educational Technology*, vol 12, no. 4, April 1972, p. 64.

"The Training Psychologist in the Aviation Training Program," by Paul W. Caro, paper for 18th Annual Southeastern Psychological Association Convention, Atlanta, Georgia, April 1972.

The Army's tendency to stress stability rather than adaptability often hinders change in training programs. The author discusses ways to increase the probability of acceptance of research findings.

"An Analysis of the Impact of VOLAR (Volunteer Army) Actions at Fort Benning," by T.O. Jacobs, paper for Psychology in the Air Force Symposium, U.S. Air Force Academy, Colorado Springs, Colo., April 1972. (Div. 4)

This paper describes an evaluation of the first year of experience at Fort Benning with actions designed to increase attractiveness of military service and thus decrease reliance on inductions (VOLAR). Through the use of a pre-VOLAR questionnaire, for baseline purposes, and periodic subsequent administrations, it was possible to assess VOLAR impact on career intentions and general attitudes toward the Army. VOLAR actions had greatest impact on soldiers' feelings about inequities, and less on needs for effective leadership, security, and pride in service. Soldiers' measured career intentions have increased systematically during the period of evaluation.

Higher Education and the Challenge of the Seventies," by David S. Bushnell, paper for the Strategies for Change and Knowledge Utilization Conference, Saratoga Springs, New York, July 1972; issued as Professional Paper 9-74, 11 pp., June 1974. PB-233 321 ED-092 033

In light of the new demands being made on higher education in the seventies, a six-step systematic change strategy is presented to implement needed reforms in educational institutions. The approach requires (a) recognition of an existing problem, (b) establishment of well-defined, assessable goals and objectives, (c) identification of constraints and needed resources; (d) selection and evaluation of alternative solutions, and (e) implementation of the selected procedure or practice. The author argues for combining the concept of systematic problem solving with the modern management strategies of participative management.

"The Army Officer as Behavior Manager," by John P. Fry, paper for American Psychological Association meeting, Honolulu, Hawaii, September 1972.

Contrary to common practice, an Army officer, trained in the behavioral sciences, used skills and techniques of contingency management, group problem solving, and performance counseling to manage a 600-man Army battalion. Even though personnel turnover was quite high, mission performance, esprit de corps, and junior officer retention rates exceed that of comparison battalions. Nonetheless, requiring subordinates to operate under conditions of less structure, more participation, and greater reliance on self-direction demanded not only great patience in overcoming initial fears, but a behavioral background which is not presently available to the Army officer.

"Selection Testing for Job Proficiency. Some Illustrated Empirical Problems in Assessing Fairness," by John S. Caylor, paper for symposium at American Psychological Association Convention, Honolulu, Hawaii, September 1972.

This paper analyzes the validity of a selection screening test for two job performance criteria for a majority and a minority segment of the population. Four hundred Army men—all of whom had taken the AFQT—were measured for job knowledge and job sample performance. Problems peculiar to selection testing were encountered. low-level and restricted range of screening scores for the minority group, and lack of data from those not hired. As one means of offsetting these factors, the author suggests obtaining regression data for pooled job occupants and examining separately the accuracy of predicted job success for different groups. This kind of local, empirical, and subpopulation validation is essential to the effective and equitable use of selection tests.

"Interactive Relationship Between Inquisitiveness and Student Control of Instruction," by John P. Fry, *Journal of Educational Psychology*, vol. 63, no. 5, October 1972, issued as Professional Paper 22-72, 9 pp., December 1972. PB-215 818

To determine the effect of student characteristics and student control on learning, three experimental variables (college aptitude, inquisitiveness, and student control) were combined in a 2 x 2 x 4 factorial arrangement. Videotape recording facilities were used to simulate a learner-computer environment, in which 192 college students were given degrees of control over the programming of their own learning. As expected, high-aptitude–high-inquiry subjects learned significantly more under a high degree of student control, and high-aptitude–low-inquiry subjects learned significantly more under a low degree of student control. Results for low-aptitude subjects were inconclusive. Overall, subjects learning under a high degree of student control learned the least. However, they formed the most favorable attitude toward the method of instruction.

HumRRO's Literacy Research for the U.S. Army. Progress and Prospects, by Thomas G. Sticht, John S. Caylor, Lynn C. Fox, Robert N. Hauke, James H. James, Steven S. Snyder, and Richard P. Kern, briefing, U.S. Continental Army Command, October 1972, issued as Professional Paper 2-73, 31 pp., January 1973. AD-758 435 ED-073 369

This report summarizes literacy research performed in HumRRO Work Units REALISTIC, READNEED, and FLIT. Data are reported that show reading demands of various Army jobs, and reading ability levels of personnel prior to, during, and after Project 100,000. Research and development of a new job-related, functional literacy training program for the Army is described.

"The Process of Effecting Change in Medical Education," by William A. McClelland, invited address at 11th Annual Conference on Research in Medical Colleges, Miami Beach, Fla., November 1972.

The author defines planned change and refutes a number of the more commonly held ideas about it. He describes those elements involved in the diffusion of change, such as the change itself, communications, the social system, and time. Factors that tend to inhibit or accelerate change are explored, as are the different levels of change and the characteristics of successful innovators. The author concludes by suggesting six steps for systematically implementing needed changes: diagramming the problem, formulating objectives, identifying constraints and needed resources, selecting potential solutions, evaluating alternatives, and implementing the selected alternatives.

"The Behavioral Model as a Tool for Analyzing 'Soft Skills'," by Paul G. Whitmore, paper for CONARC Soft Skills Conference, Fort Bliss, Tex., December 1972, included in *Soft Skills. Definition/Behavioral Model Analysis/Training Procedures*. Professional Paper 3-74, 39 pp., March 1974. AD-778 168

This report shows how the systems engineering process used for "hard" skills can be applied equally to "soft" skills. The process includes: (a) identifying the purposes of the system, (b) identifying a theory of operation for the equipment or people the workers will interact with and applying this theory to the purpose analysis, to produce a behavioral model of the job function, (c) identifying the characteristics of the work situation, and (d) applying the theory of operations to determine what the worker should do to attain the appropriate purposes in specific situations. This process provides a basis for designing job sample practice and testing procedures that will enable students in simulated job situations to practice specific skills, whether "hard" or "soft."

"Training Quality Control, the Evaluation of Leadership Skills," by T.O. Jacobs, paper for CONARC Soft Skills Conference, Fort Bliss, Tex., December 1972.

Problems in the development of leadership evaluation methods are discussed within the context of soft skills systems engineering itself. Problems include the difficulty of finding a "true expert," the general lack of clarity concerning ultimate criterion measures, and the fact that leadership skills are essentially disjunctive (as most other soft skills probably are). The paper agrees with Whitmore as to the value of the behavioral scientist, in soft skills systems engineering, but also cautions against (a) theoretical biases that may lead to misdirected work, and (b) misconceptions due to lack of experience as a line executive. Either may be counterproductive.

"What are Soft Skills," by John P. Fry and Paul G. Whitmore, paper for CONARC Soft-Skills Training Conference, Fort Bliss, Texas, December 1972, included in *Soft Skills. Definition/Behavioral Model Analysis, Training Procedures.* Professional Paper 3-74, 39 pp., March 1974. AD-778 168

Soft Skills. Definition, Behavioral Model Analysis, Training Procedures, presentations at CONARC Soft Skills Training Conference, Fort Bliss, Texas, December 1972, issued as Professional Paper 3-74, 39 pp., issued as Professional Paper 3-74, 39 pp., March 1974. AD-778 168

Three papers dealing with soft skills analysis and training are presented. "What are Soft Skills?" by John P. Fry and Paul G. Whitmore describes a questionnaire designed to clarify the terms "hard" and "soft" skills. On the basis of results from representatives of CONARC schools, soft skills are defined as important job related skills that involve little or no interaction with machines and whose application on the job is quite generalized. "The Behavioral Model as a Tool for Analyzing 'Soft Skills'" by Dr. Whitmore discusses leadership and motivation job functions in terms of principles of behavior modification, and describes development of a behavioral model of the different levels of an organization. "Procedures for Implementing Soft-Skill Training in CONARC Schools" by Dr. Fry describes the instructional approach based on a problem-solving framework, tested at the Chemical School with the redesigning of their C-22 course. Small groups and student-centered learning were important factors in the instructional approach.

"The Evaluation of Leadership Skills," by T.O. Jacobs, paper for the CONARC Soft Skills Training Conference, Fort Bliss, Texas, December 1972; issued as Professional Paper 11-73, 11 pp., December 1973. AD-772 989 ED-087 871

The paper discusses problems in the development of leadership evaluation methods, within the context of soft skills systems engineering itself. Problems include the difficulty of finding a "true expert," the general lack of clarity concerning ultimate criterion measures, and the fact that leadership skills are essentially disjunctive (as most other soft skills probably are). The paper agrees with Whitmore as to the value of the behavioral scientist in soft skills systems engineering, but also cautions against (a) theoretical biases that may lead to misdirected work, and (b) misconceptions due to lack of experience as a line executive. Either may be counterproductive.

"Leadership and Organizational Effectiveness," by T.O. Jacobs, presentation to The Secretary of the Navy's Advisory Board on Education and Training, Pensacola, Florida, February 1973.[1] (Div. 4)

The relationship between the member of a military organization and the organization is seen as a two-level contract at once formal and informal. A more or less formal contract governs the minimum each will accept from the other. An informal contract between the leader and the follower(s) governs the development of motivation to achieve much higher levels of goal attainment. Analysis of factor analytic studies shows that the four common expectations of the enlisted man are a need for pride in service and duty performed, security for self and family, equitable demands on him, and good leaders.

"Designing the Operator Into Highly Automated Systems," by Harry L. Ammerman and William H. Melching, *Instruments and Control Systems*, vol. 46, no. 3, March 1973

Human factors considerations in determining overall systems design concepts revolve around six major performance issues. (a) manual roles must be significant in accomplishing system objectives, (b) training is necessary, (c) contingency operations should be defined, (d) all-level decision ranges must be established, (e) necessary decision-making information should be identified and available, and (f) control devices needed to implement decisions must be identified. The inclusion of these human roles in the system design can be facilitated by the use of position analysis, which may involve preparing a decision outline, drawing a matrix of information-decision relationships, and analyzing position activity across time.

[1] Presentation prepared under Contract N00014-67-A-0399-0006

"Hardware Technology for Computers in Education. One of the Solubl Problems," by Robert J. Seidel, paper for the Teaching Session of the American Physiological Society, held in conjunction with the meetings of the Federation of American Societies for Experimental Biology, April 1973, and published in the November 1973 issue of *The Physiologist*, vol. 16, no. 4, pp. 610-616, issued as Professional Paper 7-74, 9 pp., May 1974. PB-233 050 ED-093 296

This paper is a discussion of the state of-the-art of hardware technology for computers in education. The choices that are available to the user, and the questions the user must ask himself before making a choice of computer hardware are discussed. An example of the costs of a central computer system for educational use is presented.

"HumRRO Aviation Psychology Research," by Wallace W. Prophet, paper for the annual convention of the American Psychological Association, Montreal Canada, August 1973.

The author discusses the program of research in aviation psychology conducted by HumRRO Division No. 6, Fort Rucker, Alabama, over the past 17 years.

Needed: A Voucher Plan in Support of Continuing Education, by David S. Bushnell, Professional Paper 7-73, 10 pp., August 1973 ED-082 006, also published in *education*, vol. 94, no. 1, September/October 1973; pp. 3-11.

Opportunities for career advancement, an adequate pool of trained manpower, and the growth of our economy are inextricably connected with the availability of continuing education and training opportunities to working adults. Availability is a function of access to training and successful participation in training. The federally funded voucher plan proposed by the author of this paper could insure the availability of lifelong learning opportunities.

"Content Validation of Training," by Howard H. McFann, paper for the annual convention of the American Psychological Association, Montreal, Canada, August 1973, issued as Professional Paper 8-73, 6 pp., September 1973. PB-224 940

Validation of training content can be approached using system analysis. Developing a job model, and analyzing job tasks, characteristics of the trainee, and the management's orientation to cost and effectiveness are all part of the process. Task analysis is one of the most critical factors in this approach, and various techniques are discussed.

"Process Versus Product Measures in Performance Testing," by William C. Osborn, paper for the Military Testing Association Meeting, San Antonio, Texas, October 1973.

Performance tests are used in training evaluation to serve two purposes. (a) to certify student achievement, and (b) to diagnose weaknesses in the instructional system. In the use of such tests, proficiency measures which focus on task outcomes (*product*) normally provide data relevant to the first purpose, whereas measures of how the tasks are carried out (*process*) pertain to the second. However, time or cost factors sometimes preclude the use of product measures, leaving measures of task process as the only available criteria for evaluating training outcomes. Instances in which process measures are typically substituted for product measures are described in this paper from the standpoint of the types of tasks for which (a) the substitution is valid, and (b) the substitution is invalid. Theoretical and practical issues pertaining to the use and misuse of process measures are discussed.

"Presentation for Panel on Early Service Screening," by Robert G. Smith, Jr., paper for the Military Testing Association Meeting, San Antonio, Texas, October 1973.

HumRRO research in Work Units TRANSITION, UTILITY and REALISTIC is described. In TRANSITION, a Composite Criterion Score, designed to reflect the overall quality of the soldier's service, could be predicted by a soldier's performance on tests in basic training and by peer ratings. The score could not be predicted by superiors' ratings. UTILITY and REALISTIC research found that a test in listening is a potential predictor of job sample performance. Several issues important for consideration in early service screening are described.

"Simulation and Aircrew Training and Performance," by Wallace W. Prophet and Paul W. Caro, paper for the Conference on Aircrew Performance in Army Aviation, Fort Rucker, Ala., November 1973; issued as Professional Paper 4-74, 15 pp., April 1974. AD-780 688

This paper outlines some major areas of use of simulation in Army Aviation and comments on current research. Equipment development, crew performance studies, concept development and training are discussed. Only in the training area has the Army made substantial progress. A broad program of simulation research with emphasis on engineering and behavior is suggested toward the goal of improving aircrew performance. There are significant simulation research problems unique to the Army which need to be worked out.

"Community College Staff Development. The Future is Now!," by David S. Bushnell and William A. McClelland, paper for the AACJC Assembly, Warrenton, Virginia, December 1973, published in *New Staff for New Students, Report of the 1973 Assembly of the American Association of Community and Junior Colleges*, 1974, pp. 10-22, issued as Professional Paper 2-74, 7 pp., February 1974. PB-231 718

The community college must respond to future demands of the adult student. A new work ethic and enforced leisure will change our educational system. Community colleges will be called on to train the needed technicians. Instructional technology will result in increased demands on teachers. The future staff must be better prepared and should understand the newer technologies of instruction.

Proceedings of Workshop on Regional Drug Abuse Programming, October 1973, Human Resources Research Organization, Professional Paper 1-74, 11 pp., January 1974. PB-230 383 ED-089 158

The Workshop on Regional Drug Abuse Programming was called to investigate the need for a federally supported model, stressing inter-agency coordination, to be employed by states as a guide for establishing substate area programs, and to explore other questions related to programs for drug abuse prevention and treatment. The organization of state and substate planning, the direction of service delivery, and the interface between state and substate or local programs were discussed by the participants. As a result of the Workshop discussions, specific recommendations in the form of (a) a resolution calling for Federal Government action and (b) suggested procedures for generating models and procedures have been drafted for submission to the Special Action Office for Drug Abuse Prevention (SAODAP). These documents are included in the report of the Workshop proceedings, as Attachments A and B.

"The Priorities and Problems of a Community College President," by David S. Bushnell, paper for the 54th Annual Meeting of the American Association of Community and Junior Colleges, Washington, D.C., February 1974.

"M-16A1 Marksmanship," LTC Jules C. Trepagnier (USA-Ret), *Infantry*, March-April 1974, pp. 53-56.

Proven methods contributing to further development of the marksman are discussed. train in small groups, left-handed shooters should use rifles with strong forward ejection patterns, emphasize aiming, trigger control, and position to the trainee, check front and rear sights for horizontal looseness (a detriment to accuracy), lubricate and clean rifles carefully, compensate for barrel heat when conducting field fire exercises, automatic rifle fire exercises, heavy fire demonstrations. The effects of type of rest, light, and wind on accuracy are also discussed.

"Needed. A Functional Literacy Skills Curriculum for the Secondary School," by Thomas G. Sticht, paper for the annual meeting of the American Educational Research Association, Chicago, Illinois, April 1974.

A review of research indicates that (a) more adults spend more time at job-related reading than any other type of reading, (b) materials written for functional purposes are often too difficult for the people who are supposed to read them, (c) secondary English courses focus more on teaching reading and writing for academic purposes than for functional purposes, and (d) efforts are needed to provide re-direction for priorities and practices in teaching English at the secondary school, with academicians shifting away from an emphasis on English and toward functional literacy.

"Community Colleges. What Is Our Job?" by David S. Bushnell and Mary Bach Kievit, *Change*, vol. 6, no. 3, April 1971, pp. 52-53, revised as Professional Paper 11-74, *Will the Real Community College Stand Up!*, 13 pp., June 1974. PB-234 955

A sampling of educators' views on community colleges is offered. Six critical forces will shape the future functions of community colleges. the continued demand for equal educational opportunities, increase in the number of 20- to 35-year-olds seeking work, the demand for white-collar workers and technical personnel will continue to expand rapidly, work is viewed as a means to an end, demand for liberal arts education; the rise in the cost of education. Community colleges have earned a prominent and permanent role in meeting the needs of a large segment of our society.

"For the Technical Communicator. Pursuing Professional Identity and Maturity," by Eugene A. Cogan, paper for the 21st International Technical Communications Conference, St. Louis, Missouri, May 1974; issued as Professional Paper 8-74, 5 pp., May 197 .. PB-233 320

The concept of technical communication as a "profession" is examined. Discussion of the attributes of a profession centers around the services provided, the characteristics of the individual, and the characteristics of the group. Groups similar in origin and state of professionalization to technical communication are also discussed. Six *prescriptions* and four *proscriptions* are offered as basic guidelines for the professionalization of technical communicators. The author projects that the profession will continue to evolve and prosper, will gradually assume more of the trappings of older, established professions; and will become a more highly specialized and technical field requiring specialized and technical training.

"Small Arms Have a Lot of Punch," by Albert L. Kubala, *Air Defense Trends*, pp. 45-46, June 1974.

Small arms fire can be extremely effective against attacking aircraft that penetrate more sophisticated defenses. The author presents a brief history of U.S. use of small caliber, non-air defense weapons. HumRRO research in forward area air defense in the early 1960s is discussed.

An Axiomatic Theory of Subject Matter Structure, by John Stelzer and Edward H. Kingsley, Technical Report 74-14, 72 pp., June 1974. AD-782 193

This report can be viewed as a first step toward development of a formal theory of instruction. An axiomatic theory of subject matter structure was formulated, including both content and task components. The subject-matter content is analyzed in terms of constituents and their relations. Underlying the content structure is the task structure that is related to the content position via coordinating relations. The notion of dependency is introduced and investigated. Dependency leads to precedence in an instructional sense and this notion is also discussed. Formal procedures are developed that can be utilized to formulate the complete dependency relationship for particular subject matters. A comprehensive detailed example is developed that serves as a vehicle to illustrate the theoretical concepts, results, and procedures.

"The Army Officer as Performance Manager," by John F. Fry, HumRRO Professional Paper in press.

This paper describes the results of one Army officer's experiment in applying the techniques of psychological research on the job. With a view to developing his subordinates' leadership ability and initiative, and permitting them an active role in managing the battalion, he emphasized particularly the principles of "contingency management" (motivation by incentives), "participative management" (group problem-solving and decision making), and "performance counseling." Despite some initial resistance by other officers, the experiment paid off in terms of battalion morale, which was rated high, responsiveness, and esprit de corps. Although emphasis was on self-motivation rather than threat of punishment as a motivating force, there was no breakdown in discipline. Future development and field-testing will be needed to provide additional information for evaluating the use of such leadership techniques in the Army.

Developing Questionnaire Items. How To Do It Well, by T.O. Jacobs, paperback, 33 pp., 1974, based on a research program resulting in *A Guide for Developing Questionnaire Items*, by T.O. Jacobs, Research Product, January 1970.[1]

This booklet was prepared to assist nonspecialists in the preparation of efficient and useful questionnaires by providing a brief, readable guide for the development of questions for management decisions.

[1] See *Bibliography of Publications As of 30 June 1971*, p. 275.

APPENDICES

Appendix A

FY 1972-74 TECHNICAL REPORTS AND PROFESSIONAL PAPERS BY NUMBER [1]

Technical Reports

Fiscal Year 1972

71-16 *The Effects of a 48-Hour Period of Sustained Field Activity on Tank Crew Performance.* (ENDURE II).

71-17 *Selection and Training for Small Independent Action Forces. Development of Materials and Procedures.* (Research for Advanced Research Projects Agency) (SIAF)

71-18 *Preliminary Handbook on Procedures for Evaluating Mental Health Indirect Service Programs in Schools.* (Research for National Institute of Mental Health) (CONVAL)

71-19 *Analyses of WIN Team Functioning and Job Requirements.* (Research for the Department of Labor) (WIN I)

71-20 *Organizational Factors in the Performance of Social Welfare and Rehabilitation Workers.* (Research for the Department of Health, Education, and Welfare) (Organizational Factors)

71-21 *Project IMPACT—Computer-Administered Instruction. Preparing and Managing the Content of Instruction, IMPACT Text-Handling Subsystem.* (IMPACT)

71-22 *Comparison and Evaluation of Printed Programs for Aircraft Recognition.* (STAR III)

71-23 *Determination of Literacy Skill Requirements in Four Military Occupational Specialties.* (REALISTIC)

71-24 *Studies on Reduced-Scale Ranging Training With a Simple Range Finder.* (SKYFIRE I)

72-1 *An Occupational Clustering System and Curriculum Implications for the Comprehensive Career Education Model.* (Research for the Ohio State University) (BUCKEYE)

72-2 *Selection and Training for Small Independent Action Forces Final Report.* (Research for Advanced Research Projects Agency) (SIAF)

72-3 *Development of a Program of Instruction for WIN Employability Orientation.* (Research for the Department of Labor) (WIN II)

72-4 *An Instructional Program for Employability Orientation.* (Research for the Department of Labor) (WIN II)

72-5 *Studies of Aircraft Recognition Training.* (STAR I)

72-6 *Recruit's Civilian-Acquired Skills. Their Potential Value and Their Utilization in Initial Military Assignments.* (Research for the U.S. Air Force) (RELAY)

72-7 *The Concepts of Performance-Oriented Instruction Used in Developing the Experimental Volunteer Army Training Program.* (VOLAR)

72-8 *Preliminary Findings From the 1971 DoD Survey of Drug Use.* (Research for Advanced Research Projects Agency) (DELTA)

72-9 *Analyses of Selected Drug-Related Topics. Findings From Interviews at Four Armed Service Locations.* (Research for Advanced Research Projects Agency) (DELTA)

[1] Research for the Department of the Army unless otherwise noted.

72-10 *Recruits' Military Preferences and Their Accommodation by the Military Services.* (Research for the U.S. Air Force) (RELAY)

72-11 *Determining Training Device Requirements in Fixed Wing Aviator Training.* (SYNTRAIN)

72-12 *Analyses of WIN Team Functioning and Job Requirements, Final Report—Duties Performed and Style of Functioning, in Relation to Team Effectiveness.* (Research for the Department of Labor) (WIN I)

72-13 *Driver Education Task Analysis. Task Analysis Methods.* (Research for the Department of Transportation) (DRIVER EDUCATION)

72-14 *Driver Education Task Analysis. The Development of Instructional Objectives.* (Research for the Department of Transportation) (DRIVER EDUCATION)

72-15 *Recruits' Postservice Occupational and Educational Plans. Nature and the Extent of Influence From Early Military Experience.* (Research for the U.S. Air Force) (RELAY)

72-16 *Training in Mechanized Stock Accounting Systems in Army Logistics.* (ACCOUNT)

72-17 *Reenlistment Intentions of Tank Commanders.* (ESPRIT)

72-18 *Summary and Review of Studies of the VOLAR Experiment, 1971. Installation Reports for Forts Benning, Bragg, Carson, and Ord, and HumRRO Permanent Party Studies.* (VOLAR)

72-19 *Postservice Occupational and Educational Plans of First-Tour Military Personnel Nearing Separation From the Service.* (Research for the U.S. Air Force) (RELAY III)

Fiscal Year 1973

72-20 *Knowledge, Skills, and Thought Processing of the Battalion Commander and Principal Staff Officers.* (CAMBCOM)

72-21 *Project IMPACT Software Documentation. Overview of the Computer-Administered Instruction Subsystem.* (IMPACT)

72-22 *Performance in Four Army Jobs by Men at Different Aptitude (AFQT) Levels. 3. The Relationship of AFQT and Job Experience to Job Performance.* (UTILITY)

72-23 *Performance in Four Army Jobs by Men at Different Aptitude (AFQT) Levels. 4. Relationships Between Performance Criteria.* (UTILITY)

72-24 *The Development of Diagnostic and Remediation Materials for New-Hire Telephone Operators* (Research for the American Telephone & Telegraph Company) (ATT-I)

72-25 *Attitudinal Studies of the VOLAR Experiment. Permanent Party Personnel, 1971.* (VOLAR)

72-26 *Gain in Student Achievement as a Function of Inservice Teacher Training in Classroom Management Techniques.* (Research for the River Rouge, Michigan, School District) (Educational Workshops)

72-27 *Reduction of Problems in Implementing and Utilizing Automatic Data Processing Systems in Logistics.* (ER-79)

72-28 *Development and Pilot Test of a Career-Oriented, Peer-Instructional Model in the Office Cluster of Business Occupations.* (Research for the Pacific Grove, California, Unified School District) (OFFICE-ED)

72-29 *Relationship of Education Level to Capabilities and Attitudes of Young Enlisted Men.* (ER-83)

72-30 *Effects of Information Load, Location, and Mode of Observation on Detecting and Identifying Brief Targets.* (NIGHTSIGHTS VI)

72-31 *Attitudinal Studies of the VOLAR Experiment: Men In Training, 1971.* (VOLAR)

72-32 *The Effects of Command Position Upon Evaluations of Leader Behavior.* (ORGE)

72-33 *An Evaluation of Alternative Programs for Training Beginning Typists in the Army.* (TYPETRAIN)

72-34 *Target Detection and Range Estimation.* (TAS)

72-35 *Development and Implementation of a Quality-Assured, Peer-Instructional Model.* (APSTRAT)

72-36 *A Plan for ULMS Weapon System Maintenance and Its Personnel Implications.* (Research for the Department of the Navy) (DOLPHIN)

72-37 *Combat Job Requirements for the Air Cavalry Aeroscout Pilot and Aeroscout Observer.* (AIRSCOUT I)

73-1 *The Prediction of AWOL, Military Skills, and Leadership Potential.* (ESPRIT)

73-2 *Relationship Between Recognition Range and the Size, Aspect Angle, and Color of Aircraft.* (TAS)

73-3 *Attempts to Improve Visual Detection Through Use of Search Patterns and Optical Aids.* (SKYFIRE III)

73-4 *Role of Selection and Growth in Performance of Experienced Men. Some Evidence From a Study of Four Army Jobs.* (FOLLOWTHRU)

73-5 *Methodologies for Determining Read ng Requirements of Military Occupational Specialties.* (READNEED)

73-6 *Attitudinal Studies of the VOLAR Experiment. A Longitudinal Study, 1971-72.* (VOLAR)

73-7 *Aptitude Level and Performance on Intramodal and Intermodal Form Discrimination Tasks.* (SPECTRUM III)

73-8 *Capabilities of Ground Observers to Locate, Recognize, and Estimate Distance of Low-Flying Aircraft.* (BR-16)

73-9 *A Comparison of Methods of Studying Illicit Drug Usage.* (MODE)

73-10 *Instructional Strategies for Training Men of High and Low Aptitude.* (SPECTRUM III)

73-11 *Educational Approaches to the Prevention of Non-Therapeutic Use of Drugs.* (PREVENT)

73-12 *A Study of Factors Affecting Mine and Boobytrap Detection. Subject Variables and Operational Considerations.* (ER-88)

73-13 *The State of Knowledge Pertaining to Selection of Cost-Effective Training Methods and Med.* (SMMART)

73-14 *Self-Paced Advanced Individual Training (AIT) and Duty Assignment Procedures.* (STOCK)

Fiscal Year 1974

73-15 *Findings and Recommendations from the U.S. Coast Guard Survey of Drug and Alcohol Use.* (Research for the Department of the Air Force) (DELTA TWO)

73-16 *Leadership Instruction for Infantry Officer Candidates. Terminal Training Objectives.* (OC LEADER)

73-17 *Development of a Cultural Self-Awareness Approach to Instruction in Intercultural Communications.* (COPE)

73-18 *Identification of the Potential Characteristics, Aptitudes, and Acquired Skills Involved in Human Detection of Mines.* (IDENTIFY)

73-19 *Components of Organizational Competence. Text of a Conceptual Framework.* (FORGE I)

73-20 *Research on Synthetic Training. Device Evaluation and Training Program Development.* (SYNTRAIN II)

73-21 *Development of Leadership Assessment Simulations.* (ASSESS)

73-22 *Methods for Ide...ifying On-the-Job Training Content When Surrogate Jobs are Used for Training.* (JOBGOAL II)

73-23 *A Model of the Functions of a Master Instructor.* (ER-91)

73-24 *Military Advising in Vietnam. 1969-1970.* (DEBRIEF III)

73-25 *Individualized Course Completion Time Predictions. Development of Instruments and Techniques.* (PRISM)

73-26 *Use of the Job Model Concept to Guide Job Description Procedures for Army Officers.* (SKYGUARD)

73-27 *Research on Stadimetric Ranging. Visually Matching the Apparent Size of Objects.* (BR-16)

73-28 *A Management Survey of Military Assistance Advisors: Activities and Behaviors.* (DEBRIEF II)

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17-71 *Systems Engineering of Coast Guard Aviator Training.* (Research for the U.S. Coast Guard) (AVTRAIN)

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11-74 *Community Colleges: What is Our Job?* (General)

12-74 *The Development of Guides for Teacher Preparation in Driver Education.* (Research for the Department of Transportation) (DOT-IG).

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- AUDREAD
- DAD
- DELTA TWO
- RELAY
- SYMDESC

Department of the Army
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- UTILITY
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Department of Defense
- DATA
- MARS
- UNCLE
- YOUTH SURVEY

Department of Health, Education, and Welfare
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- CONVAL
- Organizational Factors
- PLAQUE
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Department of Labor
- ERC
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- SPECTRA
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Department of the Navy
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- DRAGCORR
- LEADREVIEW
- NEPTUNE

Department of Transportation
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- AVCAD
- DOT-DE
- DOT-IG
- DOT-MC

Dothan, Alabama City Schools
- DOTHAN I

Ford Motor Company
- TRADE

Illinois Department of Corrections Training Academy
- GUARDTRAIN

Illinois Law Enforcement Commission
- SAEPP

Kentucky Department of Child Welfare
- ASSIST

Louisiana Regional Medical Program
- ASTARTE

Louisville, Kentucky Division of Police
- MPD II

National Board of Medical Examiners
- MEDASSESS

National League of Cities, U.S. Conference of Mayors
- VETS

National Science Foundation
- NSF-IDM

New York State Education Department
- NYSED-TO

The Ohio State University
- BUCKEYE

The Pacific Grove, California Unified School District
- OFFICE-ED

River Rouge, Michigan, School District
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BIBLIOGRAPHIC DATA SHEET	1. Report No.	2.	3. Recipient's Accession No.

4. Title and Subtitle
HUMAN RESOURCES RESEARCH ORGANIZATION BIBLIOGRAPHY OF PUBLICATIONS AND PRESENTATIONS DURING FY 1972-74

5. Report Date
December 1974

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Human Resources Research Organization (HumRRO)
300 North Washington Street
Alexandria, Virginia 22314

10. Project/Task/Work Unit No.

11. Contract/Grant No.

12. Sponsoring Organization Name and Address
Human Resources Research Organization (HumRRO)
300 North Washington Street
Alexandria, Virginia 22314

13. Type of Report & Period Covered
Bibliography 1972-1974

14.

15. Supplementary Notes
List of HumRRO research publications and products for use by those interested and concerned with training and related human performance fields.

16. Abstracts

This bibliography includes the publications and presentations by HumRRO during FY 1972-74 and can be used in conjunction with the cumulative *Bibliography of Publications as of 30 June 1971*, which lists research reports issued since 1951. The present volume supersedes the *Bibliography of Publications and Presentations During FY 1972-73*, published in December 1973. Abstracts are provided for most items; AD numbers are included where available; PB numbers are included as appropriate, for items listed in DDC under the Publications Board code; ED numbers identify the items deposited in ERIC. Most of the items are available through NTIS, U.S. Department of Commerce. The document includes report series, author, sponsor, and subject indexes.

17. Key Words and Document Analysis. 17a. Descriptors
Abstracts
Army training
Attitudes
Bibliographies
Education
Evaluation
Human behavior
Manpower
Military training
Technical reports

17b. Identifiers/Open-Ended Terms
Curriculum
Human factors research
Human performance
Individualized training
Instructional materials (programs)
Organizational behavior
Psychological research
Professional papers
Research products
Research presentations
Research publications
Social attitudes
Social programs
Training development
Training technology

17c. COSATI Field/Group 0502/0509/0510

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
Distribution of this document is unlimited.	UNCLASSIFIED	120
	20. Security Class (This Page) UNCLASSIFIED	22. Price