DOCUMENT RESUME

ED 034 182 AL 002 182

AUTHOR	Brewer, Barbara A.; Gross, Michael C.
TITLE	Conditioning of Attitudes Using a Backward Conditioning Paradigm. Language, Personality, Social and Cross-Cultural Study and Measurement of the Human A-R-D (Motivational) System.
INSTITUTION	Hawaii Univ., Honolulu. Dept. of Psychology.
SPONS AGENCY	Office of Naval Research, Washington, D.C.
REPORT NO	TR-3
PUB DATE	Aug 69
NOTE	17p.
EDRS PRICE	EDRS Price MF-$0.25 HC-$0.95
DESCRIPTORS	*Attitudes, Interaction, *Psycholinguistics, Stimulus Behavior
IDENTIFIERS	Backward Conditioning, Evaluative Meaning

ABSTRACT

In order to test whether meaning will transfer when a backward conditioning paradigm is utilized, Staats' language conditioning procedure, including the pairing of unconditioned stimulus (UCS) evaluative words with conditioned stimulus (CS) nonsense syllables, was modified so that the UCS words preceded the CS nonsense syllables on each trial. Seventy undergraduate subjects, randomly divided into two groups of 35, were exposed to this treatment. The analysis of their subsequent ratings of the nonsense syllables showed a significant conditioned meaning effect. (Authors/DO)

OFFICE OF NAVAL RESEARCH GRANT N00014-67-A-0387-0007

LANGUAGE, PERSONALITY, SOCIAL, AND CROSS-CULTURAL STUDY AND MEASUREMENT OF THE HUMAN A-R-D (MOTIVATIONAL) SYSTEM

DEPARTMENT OF PSYCHOLOGY
UNIVERSITY OF HAWAII

HONOLULU, HAWAII 96822

Conditioning of Attitudes Using a Backward Conditioning Paradigm

Barbara A. Brewer and Michael C. Gross

Technical Report Number 3

August 1969

PRINCIPAL INVESTIGATOR:
ARTHUR W. STAATS

Conditioning of Attitudes Using a Backward Conditioning Paradigm

Barbara A. Brewer and Michael C. Gross

University of Hawaii

Technical Report Number 3

August 1969

Supported by Office of Naval Research

Grant N00014-67-A-0387-0007

Principal Investigator:

Arthur W. Staats

ABSTRACT

In order to test whether meaning will transfer when a backward conditioning paradigm is utilized, Staats' language conditioning procedure, involving the pairing of UCS evaluative words with CS nonsense syllables, was modified so that the UCS words preceded the CS nonsense syllables on each trial. 70 undergraduate subjects, randomly divided into two groups of 35, were exposed to this treatment. The analysis of their subsequent ratings of the nonsense syllables showed a significant conditioned meaning effect.

Osgood (1953), Mowrer (1954) and Staats (1961) have stressed the importance of classical conditioning as a major underlying principle in the acquisition and modification of word meaning. The latter author has provided a method for testing this conception which involves pairing a number of UCS words having a common semantic component with a CS nonsense syllable. Utilizing this procedure, Staats and his associates (e.g., Staats and Staats, 1957, 1959; Staats, Staats, and Heard, 1961; Staats, Staats, Heard, and Nims, 1959) have shown that meaning may in fact be classically conditioned, and these results have been supported by the findings of other investigators (e.g., Miller, 1966; Paivio, 1964). Every study that has been reported in the area has utilized a forward conditioning paradigm; that is, the word or nonsense syllable to be conditioned has in each case preceded the UCS word. There are many instances in language, however, in which words are modifies by preceding verbal stimuli. To such cases a backward conditioning paradigm seems to apply.

The present investigation was designed to explore the possibility of conditioning evaluative meaning using a backward conditioning paradigm. UCS words sharing a common evaluative component are paired with CS nonsense syllables. Staats' conditioning procedure is followed with the exception that on each conditioning trial a UCS word precedes, rather than follows, a CS nonsense syllable.

Subjects

The subjects were 70 students, randomly selected from a class in elementary educational psychology at the University of Hawaii.

Procedure

The subjects were randomly assigned to two groups. They were told that they were taking part in a learning study, first of visually presented nonsense

syllables and secondly of spoken words. The nonsense syllables were presented with a slide projector, loaded and set so that each slide was shown for 5 seconds with a 5 second interval between syllables. The syllables VAF, XAD, YIH, VEC, and GAH were presented four times each in random order, after which the subjects were asked to check, from a list of 10 syllables, those they remembered seeing.

Next, 10 words were spoken by E with 3 second intervals between the words, after which the subjects were asked to check those which they recognized from a list of 20 words.

The subjects were told that these two types of learning would now be studied in combination and asked to give their complete attention to both types of stimuli but not to use any mnemonic devices which they might customarily employ in other learning situations. The nonsense syllables, as before, were shown automatically for 5 seconds with 5 second intervals between. The words were spoken 1 second before the onset of each syllable. Each syllable was presented 16 times. The ordering was random but with no syllable presented more than twice in succession. Five syllables were used: YOF, LAJ, XEH, QUG, and WUH. For the first group of subjects, YOF and XEH were paired with 16 positive and 16 negative words respectively, but for the second group YOF was paired with 16 negative and XEH with 16 positive words. The other three syllables were paired with words having no systematic meaning. Subjects were then told how to rate nonsense syllables on seven point semantic differential scales, on the pretext that the Es needed some indication of how they felt about the syllables in case these feelings influenced learning. The scale for each syllable was printed on a separate page and as the subjects rated the syllables they also indicated whether they recognized them from the study. Recall of the words was tested and finally, in order to test for awareness, the subjects were asked

to record any thoughts that they had had during the course of the experiment which they thought relevant, such as ideas about the purpose of the experiment.

Conditioned meaning (pleasant and unpleasant), syllables (YOF and XEH), and Groups (I and II) were the variables examined in the analysis, a Lindquist Type II design. The meaning and syllables were conceptualized in a 2 x 2 Latin square.

Results and Discussion

Five subjects in Group I and four in Group II indicated in their records that they had noticed some relationship between certain syllables and pleasant or unpleasant words. These nine records were removed before the analysis was done, so that it could not be said that the awareness caused the conditioning. One further record was removed randomly from Group II to retain equal numbers. This left an N of 30 in each group.

Table 1 presents the means and SDs of the meaning scores, the extreme pleasant score being 1 and the extreme unpleasant score 7.

The analysis of the data is presented in Table 2. The results indicate that conditioning of evaluative meaning occurred when a backward conditioning paradigm was used. The F for the conditioned evaluative meaning variable was significant at better than the .05 level with df, 1 and 59.

TABLE 1

Means and SDs of Conditioned Meaning Scores

	Syllables			
	YOF		XEH	
Group	Mean	SD	Mean	SD
I	3.50	1.28	4.63	1.30
II	4.03	1.02	4.00	1.29

Note. The pleasant pole scored 1, unpleasant 7.

TABLE 2

Analysis of Variance of Conditioning Data

Source	df	MS	F
Between Ss			
Groups	1	.07	
Error	58	1.87	
Within			
Cond. Meaning	1	10.21	6.35*
Syllables	1	9.07	5.64*
Residual	58	1.61	
Total	119		

*P less than .05

References

Lindquist, E.F. Design and analysis of experiments in psychology and education. Boston: Houghton Mifflin, 1953.

Miller, A. W., Jr. Conditioning connotative meaning. J. gen. Psychol., 1966, 75, 319-328.

Mowrer, O. H. The psychologist looks at language. Amer. Psychol., 1954, 9, 660-694.

Osgood, C. E. Method and theory in experimental psychology. New York: Oxford University Press, 1953.

Paivio, A. Generalization of verbally conditioned meaning from symbol to referent. Canad. J. Psychol., 1964, 18, 146-155.

Staats, A. W. Verbal habit-families, concepts, and the operant conditioning of word classes. Psychol. Rev., 1961, 68, 190-204.

Staats, A. W., and Staats, C. K. Effect of number of trials on the language conditioning of meaning. J. gen. Psychol., 1959, 61, 211-223.

Staats, A. W., Staats, C. K., & Heard, W. G. Denotative meaning established by classical conditioning. J. exp. Psychol., 1961, 61, 300-303.

Staats, A. W., Staats, C. K., Heard, W. G., & Nims, L. P. Replication report: Meaning established by classical conditioning. J. exp. Psychol., 1959, 57, 64.

Staats, C. K., and Staats, A. W. Meaning established by classical conditioning. J. exp. Psychol., 1957, 54, 74-80.

DISTRIBUTION LIST

NAVY

Chief of Naval Research
Code 458
Department of the Navy
Washington, D. C. 20360

Director
ONR Branch Office
495 Summer Street
Boston, Massachusetts 02210

Director ONR Branch Office
219 South Dearborn Street
Chicago, Illinois 60604

Director
ONR Branch Office
1030 East Green Street
Pasadena, California 91101

Contract Administrator
Southeastern Area
Office of Naval Research
2110 G Street, N.W.
Washington, D. C. 20037

Commanding Officer
Office of Naval Research
Box 39
Fleet Post Office
New York, New York 09510

Office of Naval Research
Area Office
207 West Summer Street
New York, New York 10011

Office of Naval Research
Area Office
1076 Mission Street
San Francisco, California 94103

Director
Naval Research Laboratory
Washington, D. C. 20390
Attn: Technical Information
Division

Defense Documentation Center
Cameron Station, Building 5
5010 Duke Street
Alexandria, Virginia 22314

Superintendent
Naval Postgraduate School
Monterey, California 93940
Attn: Code 2124

Head, Psychology Branch
Neuropsychiatric Service
U. S. Naval Hospital
Oakland, California 94627

Commanding Officer
Service School Command
U. S. Naval Training Center
San Diego, California 92133

Commanding Officer
Naval Personnel Research Activity
San Diego, California 92152

Officer in Charge
Naval Medical Neuropsychiatric
Research Unit
San Diego, California 92152

Commanding Officer
Naval Air Technical Training
Center
Jacksonville, Florida 32213

Dr. James J. Regan
Naval Training Device Center
Orlando, Florida 32813

Chief, Aviation Psychology Division
Naval Aerospace Medical Institute
Naval Aerospace Medical Center
Pensacola, Florida 32512

Chief, Naval Air Reserve Training
Naval Air Station
Box 1
Glenview, Illinois 60026

Dr. Gregory J. Mann
Naval Science Department
U. S. Naval Academy
Annapolis, Maryland 21402

Technical Services Division
National Library of Medicine
8600 Rockville Pike
Bethesda, Maryland 20014

Behavioral Sciences Department
Naval Medical Research Institute
National Naval Medical Center
Bethesda, Maryland 20014
Attn: Dr. W. W. Haythorn, Director

Commanding Officer
Naval Medical Field Research
Laboratory
Camp Lejeune, North Carolina 28542

Director
Aerospace Crew Equipment Department
Naval Air Development Center,
Johnsville
Warminster, Pennsylvania 18974

Chief, Naval Air Technical Training
Naval Air Station
Memphis, Tennessee 38115

Commander
Operational Test and Evaluation
Force
U. S. Naval Base
Norfolk, Virginia 23511

Office of Civilian Manpower
Management
Department of the Navy
Washington, D. C. 20350
Attn: Code 023

Chief of Naval Operations, Op-37
Fleet Readiness & Training
Division
Washington, D. C. 20350

Chief of Naval Operations,
Op-07TL
Department of the Navy
Washington, D. C. 20350

CAPT. J. E. Rasmussen, MSC, USN
Chief of Naval Material (MAT 03[illegible]M)
Room 1323, Main Navy Building
Washington, D. C. 20360

Chief
Bureau of Medicine and Surgery
Code 513
Washington, D. C. 20360

Technical Library
Bureau of Naval Personnel
(Pers-11b)
Department of the Navy
Washington, D. C. 20370

Director
Personnel Research Laboratory
Washington Navy Yard, Building 20[illegible]
Washington, D. C. 20390
Attn: Library

Commander, Naval Air Systems
Command
Navy Department AIR-4133
Washington, D. C. 20360

Human Resources Research Office
Division #6, Aviation
Post Office Box 428
Fort Rucker, Alabama 36360

Human Resources Research Office
Division #3, Recruit Training
Post Office Box 5787
Presidio of Monterey, California
Attn: Library 93940

Human Resources Research Office
Division #4, Infantry
Post Office Box 2086
Fort Benning, Georgia 31905

Department of the Army
U.S. Army Adjutant General School
Fort Benjamin Harrison, Indiana
Attn: AGCS-EA 46216

Director of Research
U.S. Army Armor Human Research Unit
Fort Knox, Kentucky 40121
Attn: Library

Dr. George S. Harker
Director, Experimental Psychology
Division
U.S. Army Medical Research Lab
Fort Knox, Kentucky 40121

Research Analysis Corporation
McLean, Virginia 22101
Attn: Library

Human Resources Research Office
Division #5, Air Defense
Post Office Box 6021
Fort Bliss, Texas 79916

Human Resources Research Office
Division #1, Systems Operations
300 North Washington Street
Alexandria, Virginia 22314

Director
Human Resources Research Office
The George Washington University
300 North Washington Street
Alexandria, Virginia 22314

Chief
Training and Development Division
Office of Civilian Personnel
Department of the Army
Washington, D. C. 20310

U.S. Army Behavioral Science
Research Laboratory
Washington, D. C. 20315

Walter Reed Army Institute of
Research
Walter Reed Army Medical Center
Washington, D. C. 20012

Behavioral Sciences Division
Office of Chief of Research
and Development
Department of the Army
Washington, D. C. 20310

AIR FORCE

Director
Air University Library
Maxwell Air Force Base
Alabama 36112
Attn: AUL-8110

Cadet Registrar (CRE)
U. S. Air Force Academy
Colorado 80840

Headquarters, ESD
ESVPT
L.G. Hanscom Field
Bedford, Massachusetts 01731
Attn: Dr. Mayer

AFHRL (HRT/Dr. G.A. Eckstrand)
Wright-Patterson Air Force Base
Ohio 45433

Commandant
U.S. Air Force School of Aerospace Medicine
Brooks Air Force Base, Texas 78235
Attn: Aeromedical Library (SMSDL)

6570th Personnel Research Laboratory
Aerospace Medical Division
Lackland Air Force Base
San Antonio, Texas 78236

AFOSR (SRLB)
1400 Wilson Boulevard
Arlington, Virginia 22209

Headquarters, U.S. Air Force
Chief, Analysis Division (AFPDPL)
Washington, D. C. 20330

Headquarters, U.S. Air Force
Washington, D.C. 20330
Attn: AFPTRTB

Research Psychologist
SCBB, Headquarters
Air Force Systems Command
Andrews Air Force Base
Washington, D. C. 20331

MISCELLANEOUS

Mr. Joseph J. Cowan
Chief, Personnel Research Branch
U.S. Coast Guard Headquarters
PO - 1, Station 3-12
1300 E Street, N. W.
Washington, D. C. 20226

Executive Officer
American Psychological Association
1200 Seventeenth Street, N. W.
Washington, D. C. 20036

Dr. Lee J. Cronbach
School of Education
Stanford University
Stanford, California 94305

Dr. Philip H. DuBois
Department of Psychology
Washington University
Lindell & Skinker Boulevards
St. Louis, Missouri 63130

Dr. John C. Flanagan
American Institutes for Research
Post Office Box 1113
Palo Alto, California 94302

Dr. Frank Friedlander
Division of Organizational Sciences
Case Institute of Technology
Cleveland, Ohio 10900

Dr. Robert Glaser
Learning Research and Development Center
University of Pittsburgh
Pittsburgh, Pennsylvania 15213

Dr. Bert Green
Department of Psychology
Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213

Dr. J. P. Guilford
University of Southern California
3551 University Avenue
Los Angeles, California 90007

Dr. Harold Gulliksen
Department of Psychology
Princeton University
Princeton, New Jersey 08540

Dr. M. D. Havron
Human Sciences Research, Inc.
Westgate Industrial Park
7710 Old Springhouse Road
McLean, Virginia 22101

Dr. Albert E. Hickey
Entelek, Incorporated
42 Pleasant Street
Newburyport, Massachusetts 01950

Dr. Howard H. Kendler
Department of Psychology
University of California
Santa Barbara, California 93106

Dr. Robert R. Mackie
Human Factors Research, Inc.
6780 Cortona Drive
Santa Barbara Research Park
Goleta, California 93107

Dr. Henry S. Odbert
National Science Foundation
1800 G Street, N. W.
Washington, D. C. 20550

Dr. Leo J. Postman
Institute of Human Learning
University of California
2241 College Avenue
Berkeley, California 94720

Dr. Joseph W. Rigney
Electronics Personnel Research Group
University of Southern California
University Park
Los Angeles, California 90007

Dr. Arthur I. Siegel
Applied Psychological Services
Science Center
404 East Lancaster Avenue
Wayne, Pennsylvania 19087

Dr. Arthur W. Staats
Department of Psychology
University of Hawaii
Honolulu, Hawaii 96822

Dr. Lawrence M. Stolurow
Harvard Computing Center
6 Appian Way
Cambridge, Massachusetts 02138

Dr. Edward D. Lambe, Director
Instructional Resources Center
State University of New York
Stony Brook, New York 11790

Dr. Ledyard R. Tucker
Department of Psychology
University of Illinois
Urbana, Illinois 61801

Dr. Benton J. Underwood
Department of Psychology
Northwestern University
Evanston, Illinois 60201

Mr. Halim Ozkaptan, Chief
Human Factors
Martin Company
Orlando, Florida 32809

Dr. Alvin E. Goins, Executive Secretary
Personality and Cognition Research Review Committee
Behavioral Sciences Research Branch
National Institute of Mental Health
5454 Wisconsin Avenue, Room 10A11
Chevy Chase, Maryland 20203

Headquarters USAF (AFPTRD)
Training Devices and Instructional Technology Division
Washington, D. C. 20330

Education and Training Sciences Department
Naval Medical Research Institute
Building 142
National Naval Medical Center
Bethesda, Maryland 20014

Dr. Mats Bjorkman
University of Umea
Department of Psychology
Umea 6, Sweden

Dr. Marshall J. Farr
Assistant Director, Engineering
Psychology Program
Office of Naval Research(Code 455)
Washington, D. C. 20360

Mr. Joseph B. Blankenheim
NAVELEX 0474
Munitions Building, Rm. 3721
Washington, D. C. 20360

Technical Information Exchange
Center for Computer Sciences
and Technology
National Bureau of Standards
Washington, D. C. 20234

Technical Library
U.S. Naval Weapons Laboratory
Dahlgren, Virginia 22448

Technical Library
Naval Training Device Center
Orlando, Florida 32813

Technical Library
Naval Ship Systems Command
Main Navy Building, Rm. 1532
Washington, D. C. 20360

Technical Library
Naval Ordnance Station
Indian Head, Maryland 20640

Naval Ship Engineering Center
Philadelphia Division
Technical Library
Philadelphia, Pennsylvania 19112

Library, Code 0212
Naval Postgraduate School
Monterey, California 93940

Technical Reference Library
Naval Medical Research Institute
National Naval Medical Center
Bethesda, Maryland 20014

Technical Library
Naval Ordnance Station
Louisville, Kentucky 40214

Library
Naval Electronics Laboratory Ctr.
San Diego, California 92152

Technical Library
Naval Undersea Warfare Center
3202 E. Foothill Boulevard
Pasadena, California 91107

AFHRL (HRTT/Dr. Ross L. Morgan)
Wright-Patterson Air Force Base
Ohio 45433

AFHRL (HRO/Dr. Meyer)
Brooks Air Force Base
Texas 78235

Mr. Michael MacDonald-Ross
International Training and Educa-
tion Company Limited
ITEC House
29-30 Ely Place
London EC1
ENGLAND

CDR H. J. Connery, USN
Scientific Advisory Team (Code 71)
Staff, COMASWFORLANT
Norfolk, Virginia 23511

ERIC Clearinghouse
Educational Media and Technology
Stanford University
Stanford, California

ERIC Clearinghouse
Vocational and Technical Education
Ohio State University
Columbus, Ohio 43212

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY *(Corporate author)*
Arthur W. Staats
Department of Psychology, University of Hawaii
Honolulu, Hawaii 96822

2a. REPORT SECURITY CLASSIFICATION
Unclassified

2b. GROUP

3. REPORT TITLE

Conditioning of Attitudes Using a Backward Conditioning Paradigm

4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*

5. AUTHOR(S) *(First name, middle initial, last name)*
Barbara A. Brewer and Michael C. Gross

6. REPORT DATE
August 1969

7a. TOTAL NO. OF PAGES
3

7b. NO. OF REFS
10

8a. CONTRACT OR GRANT NO
ONR N00014-67-A-0387-0007

b. PROJECT NO

c.

d.

9a. ORIGINATOR'S REPORT NUMBER(S)
Technical Report Number 3

9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)*

10 DISTRIBUTION STATEMENT
Distribution of this document is unlimited.

11. SUPPLEMENTARY NOTES

12. SPONSORING MILITARY ACTIVITY
Office of Naval Research

13. ABSTRACT

Abstract

In order to test whether meaning will transfer when a backward conditioning paradigm is utilized, Staats' language conditioning procedure, involving the pairing of UCS evaluative words with CS nonsense syllables, was modified so that the UCS words preceded the CS nonsense syllables on each trial. 70 undergraduate subjects, randomly divided into two groups of 35, were exposed to this treatment. The analysis of their subsequent ratings of the nonsense syllables showed a significant conditioned meaning effect.

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
attitudes						
backward conditioning						
classical conditioning						
evaluative meaning						
human learning and conditioning						
interpersonal attraction						
social interaction						
social learning						

DD FORM 1 NOV 68 1473 (BACK)
(PAGE 2)