

# A BEHAVIOR EVALUATION PROGRAM FOR RETARDED CHILDREN

## Progress Report Abstract

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### 1.0 Administration:

1.1 Renovation of space: By the end of August 1963, the skeletal structure of the conditioning cubicles and one office was completed, doors were hung and an electrical power panel installed through the generosity of Fernald parents aided by grant funds which did not arrive until September 13. Under a special legislative (State) appropriation of \$20,000 for further alteration of space, additional construction was begun in mid December and continued through the end of March, 1964. During this time, work supported by this grant continued, though at a much reduced pace due to the continual disruption of noisy workmen and the necessity of limiting our research activities to nights and weekends.

Structurally the new Behavior Prosthesis Laboratory comprises eight conditioning cubicles, apparatus control area, shop, three offices, a patient waiting room, an experimental classroom, and a lavatory.

1.2 Personnel: In spite of the many trying inconveniences of working amid construction "fall-out," we have located some loyal and apparently competent staff. A well experienced secretary (half time), a research assistant (FT), a laboratory assistant (FT), a registered nurse (FT), and two electronic technicians (part time) are with us. The Project Director and laboratory assistant are supported by salaries recently made available by State legislative appropriation. The registered nurse was recently assigned to the project by the institution. In addition we have an NIMH Predoctoral Fellow from Harvard University.

1.3 Office routine: Our own purchasing, receiving, inventory, bookkeeping, and filing routines have been worked out and are in smooth operation with appropriate forms, stamps, etc. A manual of administrative procedures is being compiled so that all staff may "fill in" when necessary.

1.4 Furnishing and equipment: Two offices have been partially furnished and equipped with funds from the Corporation of the Walter E. Fernald School. The classroom, patient's lounge, and shop contain considerable cast-off furniture. The shop continues to be equipped with the tools and supplies necessary to meet apparatus needs.

2.0 Research: Two conditioning cubicles went into operation in December, 1963. Due to construction, research could be conducted only sporadically on weekends until the end of March. Since then, these two rooms have been in daily operation throughout each week. Twenty-eight patients are currently under study, 13 of whom are new to these methods and are severely retarded non-verbal children. By the end of May we will have nearly 400 sessions on our total patient group.

2.1 Deficits in response differentiation and stimulus discrimination: Our method for analyzing deficits in the ability to tell two responses apart

and the ability to tell two stimuli apart has been confirmed on Fernald children we previously studied at Dr. Landslog's laboratory. Their behavior on these new devices, when compared with their 2½ year laboratory histories, indicates direct comparability with the data obtained in our earlier pilot work in the Harvard Behavior Research Laboratory. As we anticipated, all children's behavioral output increased greatly after interruption of from 6 to 10 months. Some have shown considerable loss of previously acquired response patterns, others have fully retained previously learned behavior, and some have revealed new deficits as a result of prolonged interruption of conditioning.

We are adding various forms of auditory stimuli to the present enclosure as well as a third response alternative to further analyze deficits already revealed in earlier work and to permit extension of our techniques to blind patients. New patients from severely retarded and multiply handicapped groups are being added as we amplify the sensitivity of our methods for application to increasingly defective levels of behavior.

- 2.2 Stimulus generalization deficits: Another method for identifying these factors which may retard or prevent formation of simple discriminations has been set up in a second conditioning cubicle. Severely retarded children are being trained for an analysis of their generalization gradients. The characteristics of a child's gradients along several stimulus continua should shed light on the nature of his discrimination errors. By functionally identifying these variables which enable each child to respond differentially to various points on each stimulus continuum, we hope to sharpen his discrimination and thereby to reveal potentially useful information for individualized training procedures outside the controlled laboratory environment.

### 3.0 Communication:

- 3.1 Publication: A chapter on "Programed Learning and Retarded Behavior" is being prepared by the Project Director for a book entitled Methods in Special Education edited by Norris Haring and Richard Schiefelbusch to be published by McGraw-Hill. Half of this chapter was completed during the slow early phases of laboratory construction.
- 3.2 Invited presentations at professional and scientific meetings by the Project Director:
- 3.21 "Continuous Measurement and Prosthesis of Retarded Behavior," Third Annual Conference on Mental Retardation, Greene Valley Hospital and School, Greeneville, Tenn., March, 1964.
- 3.22 "Operant Conditioning with the Trainable Mentally Retarded," Council for Exceptional Children, Chicago, April, 1964.
- 3.3 Presentations invited by local parent and professional groups: include the professional staffs of the Wrentham State School and the South Shore Guidance Center, the Boston Association for Retarded Children, and the Charles River Association for Retarded Children.
- 3.4 Invited conference participation: The Project Director participated in a conference on "Longitudinal and Long-Term Follow-up Studies of Children with Brain Injury" sponsored by the Johns Hopkins Department of Psychiatry, the Woods Schools, and the Association for Aid to Crippled Children, West Point, October, 1963.

3.5 Laboratory visitors: A total of 66 professional and 38 student visitors have toured the new Behavior Prostheses Laboratory and conferred with the Project Director on our work and plans.

3.6 Laboratory visits by the Project Director have been made to five facilities whose work is relevant to this project: those of Drs. Gershon Berkson, Murray Sidman, Harold Weiner, C. E. Ferster, and I. Goldiamond.

4.0 Training: We are fortunate to have an NIMH Predoctoral Fellow from the Harvard Department of Psychology with us. Mrs. Laurel Furumoto has a Masters Degree in Clinical Psychology from Ohio State and a specialized interest in behavioral conditioning of severely retarded children. She was referred to us by Professor B. F. Skinner and Dr. R. Herrnstein of Harvard where she is currently a doctoral candidate. Under the joint sponsorship of Dr. Herrnstein and the Project Director, Mrs. Furumoto was awarded an NIMH Fellowship to conduct her doctoral experiments with severely retarded children in this laboratory. She will determine the extent to which we can predict discrimination ability of individual retarded children from their generalization gradients. Part of her work will involve specific operant discrimination training with children considered to be beyond the pale of other training methods. In addition, she will determine the effectiveness of various training methods in changing the form of each child's generalization gradients.

RESEARCH:

EXPANDING THE APPLICABILITY OF CURRENT BEHAVIOR EVALUATION METHODS:

PURSUING THE STRATEGIES AND OBJECTIVES OUTLINED IN OUR ORIGINAL GRANT REQUEST, WE PLAN TO DEVELOP ADAPTATIONS OF CURRENTLY AVAILABLE BEHAVIORAL CONDITIONING METHODS TO 1) PERMIT MORE PRECISE ANALYSIS OF DEFICITS ALREADY LOCATED AND 2) EXAMINATION OF A WIDER RANGE OF RETARDED BEHAVIOR. THESE PLANS INCLUDE:

- 1.11 FURTHER ANALYSIS OF APPARENT RESPONSE DIFFERENTIATION DEFICITS: THE MOST FREQUENT DEFICIT THUS FAR SHOWN IN OUR GROUP OF RETARDED CHILDREN IS AN INABILITY TO DIFFERENTIATE TWO RESPONSES. OUR CURRENT PROCEDURES WILL BE MODIFIED TO DETERMINE WHETHER RESPONSE DIFFERENTIATION DEFICITS ARE INDEPENDENT OF SIMULTANEOUS DISCRIMINATION DEFICITS. THE RESULTS WILL HAVE IMPLICATIONS FOR OTHER METHODOLOGICAL DEVELOPMENTS PLANNED BELOW.
- 1.12 EXTENDING THE USEFULNESS OF OUR BEHAVIOR EVALUATION METHODS: SUBSTITUTING AUDITORY SIGNALS FOR OUR CURRENT VISUAL SIGNALS WILL PERMIT US TO EXPLORE THE NATURE OF RESPONSE DIFFERENTIATION AND STIMULUS DISCRIMINATION DEFICITS AND ABILITIES AMONG THE 300 BLIND AND PARTIALLY SIGHTED RETARDED STUDENTS RESIDING IN THE BUILDING WHICH HOUSES OUR LABORATORY. IN ADDITION TO COMPARING THEIR DEFICITS WITH THOSE OF THE SIGHTED RETARDED, WE WILL LOOK FOR WHATEVER "EFFICIENCY-PRODUCED SPECIFIC SUPERIORITY" OUR TECHNIQUES MIGHT LOCATE (LINDSLEY, 1964).
- 1.13 DIRECT AND FUNCTIONAL RECORDING OF HYPERKINETIC AND REPETITIVE MOTOR SYSTEMS: CONCURRENT WITH THE ABOVE, WE WILL DEVELOP ADDITIONAL METHODS FOR DIRECTLY RECORDING GENERAL HYPERKINETICITY AS WELL AS SPECIFIC FORMS OF REPETITIVE MOTOR SYMPTOMS. THESE METHODS WILL BE INCORPORATED INTO THE CIRCUITRY OF OUR DISCRIMINATION-DIFFERENTIATION APPARATUS TO YIELD CONTINUOUS RECORDING OF THE FUNCTIONAL RELATIONSHIPS BETWEEN SYMPTOMATIC BEHAVIORS AND VARIOUS COMPONENTS OF "ADJUSTIVE" BEHAVIOR ALREADY BEING ANALYZED. IN ADDITION, A THIRD CUBICLE WILL BE EQUIPPED FOR THE SPECIFIC PURPOSE OF EXPLORING VARIOUS TECHNIQUES FOR CONTROLLING THESE SYMPTOMS BY APPROPRIATE SELECTION AND ARRANGEMENT OF THEIR IMMEDIATE ENVIRONMENTAL ANTECEDENTS AND CONSEQUENCES.
- 1.14 INTENSIVE EVALUATION OF INCREASINGLY SEVERE FORMS OF RETARDATION: AS ANTICIPATED, MANY OF OUR MORE SEVERELY RETARDED CHILDREN DEMONSTRATE PATTERNS OF RESPONSE THAT ARE REMARKABLY DIFFERENT FROM THE MORE INTACT CHILDREN. WHETHER THESE PATTERNS ARE A PROPERTY OF SEVERE RETARDATION OR A FUNCTION OF PROPERTIES IN THE IMMEDIATE CONDITIONING ENVIRONMENT MUST BE DETERMINED BEFORE WE CAN DEVELOP SUITABLY SENSITIVE TECHNIQUES FOR EVALUATING BEHAVIOR CAPABILITIES AND DEFICITS AT THE LOWER END OF THE RETARDATION RANGE. ACCORDINGLY, OUR PLANS ARE UNDER WAY TO EXPLORE THE TYPES OF REINFORCERS THAT MIGHT BE BOTH 1) MOST POWERFUL IN LABORATORY ASSESSMENT AND 2) MOST RELEVANT FOR THE WARD TRAINING OF THESE CHILDREN.

OUR FOURTH AND FIFTH CUBICLES WILL BE EQUIPPED TO ANALYZE THE RELATIVE EFFECTIVENESS OF DIFFERENT SOCIAL "NARRATIVE" REINFORCERS VIA CLOSED CIRCUIT TELEVISION PROGRAMED IN SUCH A MANNER THAT THE PATIENT'S BEHAVIOR CONTROLS BOTH THE SOUND OF AND THE SIGHT OF ANOTHER PERSON (INDEPENDENTLY). PREVIOUS WORK HAS SHOWN THIS TECHNIQUE TO BE UNIQUELY POWERFUL IN GENERATING BEHAVIOR AMONG DEBILITATED CHRONIC PSYCHOTIC PATIENTS (LINDSLEY, 1965)

PREPARATION FOR FUTURE APPLICATIONS IN WARD TRAINING:

- 1.21 SELECTION OF SUBJECTS: A MAJORITY OF THE SEVERELY RETARDED CHILDREN BEING ADDED TO OUR INITIAL GROUP RESIDE IN A DORMITORY WHOSE WARDEN HAS REQUESTED OUR CONSULTATION IN TRAINING BASIC SELF-HELP SKILLS. WE ARE FOCUSING ON THE RESIDENTS OF THIS DORMITORY IN THE HOPE THAT WE MAY EVENTUALLY DEVELOP INDIVIDUALIZED TRAINING PROCEDURES FOR THESE CHILDREN WHICH WILL TEST OUT THE PREDICTIVE VALIDITY OF OUR LABORATORY EVALUATION METHODS
- 1.22 INSTITUTIONAL STAFF PARTICIPATION IN LABORATORY EXPERIMENTS: SINCE THE PERSONNEL OF THE INSTITUTION DISPENSE MOST OF THE "SOCIAL" REINFORCEMENT AVAILABLE WITHIN THE INSTITUTION, WE PLAN TO REQUEST THE COOPERATION OF VARIOUS PERSONNEL REPRESENTING A VARIETY OF RELATIONSHIPS WITH A GIVEN CHILD. IN THIS WAY WE HOPE TO OBTAIN REVEALING PREFERENCES AMONG THE CHILDREN AS WELL AS TO DIRECTLY INVOLVE KEY TRAINING PERSONNEL IN THE WORK OF THE LABORATORY.

REFERENCES FOR PLANS SECTION 1.0

LINDSLEY, O.R. DIRECT MEASUREMENT AND PROSTHESIS OF RETARDED BEHAVIOR  
 J. EDUC., 1964 (IN PRESS)

LINDSLEY, O.R. EXPERIMENTAL ANALYSIS OF SOCIAL REINFORCEMENT  
 AMER. J. ORTHOPSYCHIAT, 1962, 33, 62-66, 9

PUBLICATION:

THE CHAPTER REFERRED TO EARLIER ("PROGRAMMED LEARNING AND RETARDED BEHAVIOR") WILL BE COMPLETED FOR PUBLICATION. IN ADDITION, WE PLAN TO COMPLETE TWO ARTICLES REPORTING FINDINGS OF OUR WORK AND THEIR IMPLICATIONS FOR METHODS OF EVALUATING AND TRAINING RETARDED BEHAVIOR. IT IS ANTICIPATED THAT EACH OF THESE ARTICLES WILL BE SUBMITTED FOR PRESENTATION TO AN APPROPRIATE PROFESSIONAL MEETING PRIOR TO PUBLICATION

2.2 INSTITUTIONAL PERSONNEL: TO HELP STIMULATE FEEDBACK ON PATIENTS STUDIED IN THE LABORATORY AND TO PAVE THE WAY FOR FUTURE COOPERATIVE WORK IN PATIENT TRAINING. WE PLAN TO INVITE VARIOUS GROUPS OF FERNALD SCHOOL SUPERVISORY, CARETAKING, AND HABILITATIVE PERSONNEL TO VISIT THE LABORATORY AND TO BECOME ACQUAINTED WITH ITS WORK THROUGH INFORMAL TALKS. THE PROJECT DIRECTOR PLANS TO PRESENT MORE FORMAL TALKS IN A SERIES OF SEMINARS FOR THE NURSING AND TEACHING STAFFS NOW BEING PLANNED IN CONJUNCTION WITH DR. HUGO MOSER, DIRECTOR OF MEDICAL SERVICES AT THE FERNALD SCHOOL.

#### 3.0 PERSONNEL:

MRS. LAUREL ~~FURMOTO~~ WILL APPLY FOR A SECOND YEAR OF HER NIMH PREDOCTORAL FELLOWSHIP AND PLANS TO CONTINUE HER ANALYSIS OF STIMULUS GENERALIZATION AND DISCRIMINATION TRAINING AMONG SEVERELY RETARDED CHILDREN. IN ADDITION, SHE WILL PARTICIPATE IN OUR ANALYSIS OF NARRATIVE SOCIAL REINFORCEMENT VARIABLES AMONG THESE CHILDREN.

THREE OTHER PREDOCTORAL STUDENTS HAVE INDICATED THEIR DESIRE TO RECEIVE TRAINING AT THIS LABORATORY IN ORDER TO PURSUE SPECIALIZED INTEREST IN RETARDED BEHAVIOR. IT IS HOPED THAT AT LEAST ONE OF THESE GRADUATE STUDENTS MAY RECEIVE SUPPORT FROM THE NIMH PREDOCTORAL FELLOWSHIP PROGRAM. WE ARE PARTICULARLY INTERESTED IN STUDENTS WHO MAY WISH TO APPLY LABORATORY FINDINGS IN DESIGNING AND EVALUATING DEFICIT-SPECIFIC TRAINING PROCEDURES WITH CHILDREN BEING STUDIED IN THE LABORATORY.

#### 4.0 ADMINISTRATION:

ALONG WITH CONTINUED EFFORTS TO SOLICIT DONATIONS FOR FURNISHING AND EQUIPPING OUR PATIENT LOUNGE, CLASSROOM, AND THIRD OFFICE, WE HOPE TO WORK OUT SOME APPROPRIATE ARRANGEMENTS FOR JANITORIAL SERVICE AND ADEQUATE SPACE FOR PARKING AND DELIVERY OF PATIENTS. OUR MANUAL OF ADMINISTRATIVE PROCEDURES WILL BE COMPLETED.

#### OBJECTIVES:

##### TRAINING FUNCTION ADDED; OTHERWISE UNCHANGED:

THE ONLY CHANGE IN THE OBJECTIVES OF THIS PROJECT CONCERNS AN ADDITIONAL FUNCTION: THAT OF TRAINING ADVANCED GRADUATE STUDENTS. WE HAVE NOT ANTICIPATED THAT WE WOULD BE SOUGHT OUT AS EARLY AS OUR FIRST YEAR OF OPERATION BY FOUR WELL QUALIFIED STUDENTS. THE SIGNIFICANCE OF THIS ADDED FUNCTION CONCERNS PRIMARILY THE MATTER OF TIME AND FUNDS.

WE ARE NOT BUDGETED FOR STUDENT STIPENDS OR FOR THE AMOUNT OF AUTOMATIC PROGRAMING AND RECORDING EQUIPMENT NEEDED BY EVEN A SINGLE GRADUATE STUDENT. OUR PHILOSOPHY OF TRAINING PRECLUDES TREATING AN ADVANCED GRADUATE STUDENT AS A LABORATORY TECHNICIAN WITH ASSIGNED ROUTINE DUTIES. RATHER WE PREFER TO PROVIDE OPPORTUNITY FOR A STUDENT TO CONDUCT HIS OWN CREATIVE INVESTIGATIONS WHICH MIGHT DOVETAIL WITH THE ONGOING WORK OF THE LABORATORY AND THEREBY BOTH COMPLEMENT AND SUPPLEMENT ITS OVERALL STRATEGIES AND AIMS. WHILE IT IS HOPED THAT SOME OF THE EQUIPMENT NEEDS OF OUR STUDENTS WILL BE HANDLED THROUGH THEIR UNIVERSITY DEPARTMENTS, WE REALIZE THAT, TO ENCOURAGE FRESH IDEAS AND NEW CONTRIBUTIONS WE WILL HAVE TO MAKE AVAILABLE CERTAIN NEW PIECES OF EQUIPMENT. ALSO, SOME OF THE PROJECT DIRECTOR'S TIME WILL BE DEVOTED TO SUPERVISING AND CONSULTING WITH STUDENTS AS THEIR WORK PROGRESSES.

#### FOREIGN TRAVEL:

NONE UNDERTAKEN DURING THIS PERIOD.

#### PUBLICATIONS:

NONE THIS FAR; THREE IN PROGRESS (SEE ABOVE).