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# BEHAVIORAL INDIVIDUALITY IN FOUR CULTURAL-FAMILIALLY RETARDED BROTHERS*

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**Summary**—Four brothers were admitted to a state training school at the same time. During seven weekly sessions, prior to their unexpected withdrawal from the institution, their acquisition and maintenance of free-operant differentiation and discrimination were recorded in a controlled laboratory environment. Continuous, simultaneous, direct, automated measurements revealed striking differences in the accuracy, efficiency, and stability of their ongoing behavior, despite marked similarity of their case-record data. The need for sensitive methods of analyzing specific behavioral abilities and deficits in retarded children is indicated.

> "Psychology . . . has the double duty of showing how individuals are alike and how they differ."
>
> R. S. WOODWORTH (1940)

AS MORE reliable, sensitive, potentially practical techniques for analyzing retarded behavior are developed, an enormous range of behavioral individuality among retarded children is becoming more and more evident (Jensen, 1963). But mental retardation practitioners are still largely dependent on assessment procedures which homogenize rather than explicate individual behavioral differences. In large public institutions for the retarded, where understaffing and overcrowding are chronic problems, a child's training program may be based on a single IQ score. Even the component subtest scores may not be considered. Once a child is assigned to a ward or classroom on the basis of sex and IQ, his opportunities for behavioral development may be severely limited; his individual abilities and deficiencies may be masked by assumptions of homogeneity.

Of the many nosological categories of mental retardation, the cultural-familial has been one of the most vulnerable to homogenization. The diagnosis is primarily one of exclusion—one which requires *absence* of positive medical findings.

The assumption of homogeneity within the cultural-familial subgroup is reflected in the common practice of excluding from psychological studies individuals with other diagnoses on the grounds that their presumed greater behavioral diversity would create statistically undesirable and experimentally uncontrollable variance. But despite efforts

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to obtain a "pure culture," wide variability among retarded subjects is more the rule than the exception (Berkson, 1966).

Cultural-familial retardation—mental retardation in the absence of organic pathology—is a challenge to behavioral science. The scope of this classification has not been usefully delineated by assignment of IQ scores. Behavioral science is only beginning to provide the mental retardation practitioner with an array of reliable tools for uncovering and remediating the individual child's deficits.

Sensitive, automated procedures that were developed for studying the behavior of lower organisms (Skinner, 1959) have been adapted over the past 15 yr for directly recording and analyzing human behavior (Ulrich, Stachnik and Mabry, 1966). These methods have yet to find broad application in the field of mental retardation, but there is mounting evidence that they could contribute to the analysis and prosthesis of retarded behavior (e.g. Ellis, Barnett and Pryer, 1960; Orlando and Bijou, 1960; Spradlin, Girardeau and Hom, 1966; Sidman and Stoddard, 1967). In our laboratory we have uncovered dramatic individual differences among retarded children in the temporal course and level of acquisition as well as in the long-term stability of several basic behavioral processes. A wide range of behavioral individuality has been found not only within an unselected group of children (Barrett, 1965a), but also within groups selected for homogeneity of IQ (Barrett, 1965b) and for similarity of medical diagnosis. Specific deficits have been located in individual children (Barrett and Lindsley, 1962), and their differential amenability to procedural variations has been demonstrated (Barrett, 1965b, 1967). Underlying these procedures is a fundamental principle: The child's behavior is the final criterion of effective training.

What follows is a laboratory vignette—a glimpse of four brothers, 8–14 yr old, admitted on the same day to a state training school for the retarded and assigned to the same dormitory after evaluation by routine procedures. They were selected for laboratory study because of their fraternal relationship, their common diagnosis of cultural-familial retardation, their very recent admission, and the fact that they had not been previously institutionalized. Our plans for long-term, intensive analysis of their individual behavior patterns were aborted when the boys' parents unexpectedly withdrew them from the institution less than 10 weeks after their admission. But even our brief assessment of their behavior in one type of situation revealed remarkable differences among them. We feel that their data provide a provocative contribution to the growing body of evidence that procedures for analyzing specific abilities and deficits in individual retarded children can be developed.

## SUMMARY OF CASE RECORDS

David, Donald, Raymond and Maurice had seven other siblings.* All four boys were born at home and delivered by the father. Maurice was 3 weeks premature; the others were full-term, normal babies. They all began to teethe at 6–8 months, to walk at 1 yr, and to talk at 2–2½ yr.

The children had been expelled from regular school because of "nonconforming" behavior. A school psychologist recommended that all four boys be placed in special-education programs in their community, but they were soon referred to the institution.

Pre-admission evaluations of the four brothers are summarized in Table 1. The most impressive feature of the case records is their similarity. The reliability of the information

* In the year following withdrawal of David, Donald, Raymond, and Maurice, three of their other siblings were referred to the institution by a welfare agency.

given by the father was questioned by one interviewer, but subsequent clinical evaluations failed to refine the amorphous uniformity implied by the boys' histories. Diagnoses were the same for all four children: cultural-familial retardation. Institutionalization was recommended. The medical examiner noted that David's tonsils should be removed, and it was suggested that he needed a hearing aid. The only other suggestion for remediation was the same for all four boys: speech and hearing therapy.

The children were assigned to the same dormitory, and during their 67 days at the institution, the only apparent difference in their treatment was the administration of Thorazine (25 mg b.i.d.) to Donald,* who was considered hyperactive by the attendant staff.

## ANALYSIS OF INDIVIDUAL BEHAVIOR†

During their 4th week in residence and at regular intervals until they were withdrawn from the institution, the brothers were brought to the laboratory individually. One-hour sessions were conducted in a standardized *automatically controlled environment:* a small room, equipped with a wall panel comprising two rectangular inserts that can be lighted, a plunger beneath each light, and an opening into which candies and pennies can be dispensed.‡ Masking noise and the absence of other objects in the room minimize the possibility of distraction.

The apparatus was programmed identically for all four boys. The panel lights alternated from left light on (C1) to right light on (C2), or vice versa, at 1-min intervals so that each hour-long session included 30 min of C1 and 30 min of C2. The plungers—M1 on the left, and M2 on the right—could be pulled at any time. However, to get a piece of candy or a penny§ the child had to pull the left plunger ten times when the left light was on. The right plunger never produced pennies and candies, and the left plunger was ineffective, though operable, when the right light was on. Thus, of the four possible reflexes—C1M1 (left light-left plunger), C1M2 (left light-right plunger), C2M1 (right light-left plunger), C2M2 (right light-right plunger)—only C1M1 paid off. Ten emissions of this reflex automatically produced a penny or piece of candy.‖

The children received minimal introduction to the apparatus. The E pointed out the two plungers and the penny-candy delivery aperture and told the child that as soon as the lights went on he could work the machine to get pennies and candies. The child was given a box for his goodies; then the experimenter left, locked the door, and turned on the apparatus.

* The clinical records indicate only that Thorazine was being given to Donald by the 13th day after admission; there is no information as to when medication was begun, the route of administration, or whether it was continued until he left the institution.

† Portions of these data were discussed at a meeting of the American Association on Mental Deficiency, New York, April, 1962, and portions were reported by *Children Limited*, June, 1964.

‡ The discrimination panel is available from the Behavior Instruments Co., 20 Fletcher Ave., Lexington, Mass. 02173. It was designed by Ogden R. Lindsley, Ph.D., University of Kansas Medical Center, whose analysis of the behavior of chronic psychotic patients inspired much of our current research on retarded behavior.

§ Pennies and assorted candies were dispensed in a random order, in a ratio of one penny to six pieces of candy.

‖This is called a fixed-ratio 10 (FR 10) schedule of reinforcement.

TABLE 1. RESULTS OF PRE-ADMISSION PHYSICAL, SCHOLASTIC, AND PSYCHOLOGICAL EXAMINATIONS AS ENTERED IN THE CASE RECORDS OF THE FOUR BROTHERS

| | DAVID | DONALD | RAYMOND | MAURICE |
|---|---|---|---|---|
| Age at examination | 9–11 | 8–6 | 10–11 | 14–0 |
| Height and weight | 49 in., 55 lb | 49 in., 60 lb | 54 in., 72 lb | 62½ in., 98 lb |
| Head circumference | 48 cm | 52 cm | 49 cm | 48 cm |
| Vision | 20/20 | 20/20 | appears normal with glasses | 20/20 |
| Hearing | moderate impairment; hearing aid suggested | impairment; preferential classroom seating suggested | slight impairment; preferential classroom seating suggested | slight impairment; preferential classroom seating suggested |
| Speech | grossly defective; speech therapy recommended | very defective; speech therapy recommended | very defective; speech therapy recommended | mild impairment; speech therapy recommended |
| Teeth | in need of repair | carious | needs dental attention | carious |
| Tonsils | enlarged | not inflamed | previously removed | previously removed |
| Coordination | within normal limits | within normal limits | fair | good |
| Tendon reflexes | slightly increased throughout | increased throughout | generalized hyper-tension | increased |
| Gait and posture | normal | normal | normal | normal |
| Muscle tone and strength | good | good | good | good |

TABLE 1. (*Continued*)

| | | | | |
|---|---|---|---|---|
| Abnormal reflexes | none | none | none | none |
| Cranial nerves | normal | normal | normal | normal |
| Blood and urine tests | normal | normal | normal | normal |
| Education | first grade year of admission; expelled with brothers | not beyond first grade | started at unknown time; first grade when expelled | started at age 9; special class; expelled for non-conforming behavior |
| Scholastic achievement tests | knows primary colors; is able to count; does not know right from left or the alphabet | very immature; counts only to 10; does not know alphabet, right from left, or all primary colors | unable to perform on school test; limited and seems to be trainable | — |
| Arithmetic | first-grade level | low first-grade level | — | low first-grade level |
| Language | high first-grade level | high first-grade level | — | low first-grade level |
| Writing | first-grade level | — | — | high second-grade level |
| Reading | — | — | — | kindergarten level |
| Geography | — | — | — | second-grade level |
| Practical knowledge | good | good | poor | good |
| Psychometric scores (S–B) | MA 7–6, IQ 72 | MA 5–3, IQ 55 | MA 4–11, IQ 48 est. | MA 7–10, IQ 63 |
| Tester's comment | reliable assessment of present functioning | appears to be well represented by obtained MA | estimated because of inconsistencies of performance and markedly poor speech | valid and reliable assessment of current functional intellect |
| Diagnosis | mental deficiency, mild; familial, sociocultural and deprivation factors | mental deficiency, moderate; familial, sociocultural and deprivation factors | mental deficiency, severe to moderate; familial, sociocultural and deprivation factors | mental deficiency, moderate; familial |

*Continuous, direct recording of individual behavior*

Every time the child pulled a plunger, the movement automatically activated one of four counters and one of four cumulative recorders, depending on which light was on (C1 or C2) and which plunger he pulled (M1 or M2). The counters indicated the total number of times each reflex occurred, and the cumulative recorders produced graphs which show the child's *rate* of emission of each reflex at every moment during the hour.*

The records of each brother's *1st hour* in the same controlled situation revealed dramatic differences among them (Fig. 1).

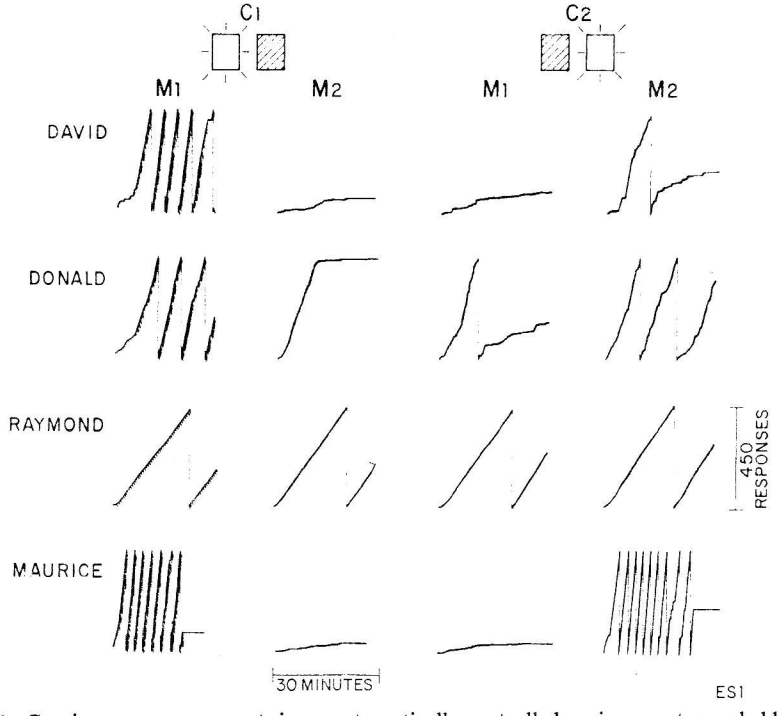


FIG. 1. Continuous measurements in an automatically controlled environment revealed behavioral differences among four cultural-familially retarded siblings. During this 1st hour, patterns ranged from the acquisition of a normal adult (David) to a prepotent superstitious generalization with no acquisition (Maurice).

Unlike the other boys, **David** began crying when the door to the experimental room was closed. His objection was so strong that we permitted him to have the door ajar. Despite potentially distracting activities in the corridor, David showed the most rapid acquisition of the four brothers. Within ten minutes he acquired what turned out to be his most stable rate of operating the "payoff" plunger under the "correct" light (C1M1). During this time he also tried out the other combinations, C1M2, C2M1, and C2M2. By the middle of the hour his rate of C1M2 was nearly zero, indicating that he was differentiating the plungers—that is, that he could tell which plunger produced pennies and

* The cumulative recorder feeds paper horizontally at a constant speed. Each plunger operation moves the recording pen up one step. After 450 plunger operations have been recorded, the pen automatically resets to the base and is ready to step up with the next plunger operation. Horizontal lines in the graphs are periods when no plunger movements occurred. Hatchmarks show delivery of a penny or candy.

candies and which did not. During the last half hour, he rarely pulled the payoff plunger when the other light was on (C2M1), showing that he was also discriminating the two light configurations. But while he was rapidly learning to differentiate the plungers and to discriminate the lights, his C2M2 rate remained high. Finally, during the last half of the hour, he discovered that it did not always pay to pull the plunger under the light that was on. His control of this overgeneralization was shown by dramatic deceleration of the C2M2 reflex while the rate of C1M1 remained high. David learned to respond differentially, to discriminate the lights, and not to generalize unproductively within an hour—about the same time it takes normal adults to acquire these behaviors (Lindsley, 1958).

**Donald's** 1st hour did not show this pattern. He began by pulling the plungers alternately, regardless of which light was on. After 6 min, this gave way to simultaneous operation of the plungers for 10 min. Although his initial C1M2 rate was much higher than David's, Donald, too, abandoned this unproductive reflex within the first 30 min. Although his C1M1 rate was lower than David's throughout the hour, his early cessation of C1M2 operation indicated that he had acquired differentiation of the plungers as rapidly as David had. Donald's discrimination of the lights, however, was not as well-defined as David's. Donald's C2M1 rate decreased during the last half hour, but he continued to operate the payoff plunger (M1) occasionally when the incorrect light was on (C2). The most striking difference between David's and Donald's 1st hour was Donald's high C2M2 rate. Despite deceleration of the other two unproductive reflexes, he did not learn that, even though pulling the left plunger produced goodies when the left light was on, pulling the right plunger when the right light was on produced nothing.

**Raymond's** 1st hour was very different from both David's and Donald's. Although Donald quickly gave up alternation of the plungers, Raymond continued this stereotyped behavior throughout the hour. His nearly equal rates of pulling the plungers indicated that, to him, they were functionally identical; he behaved as if there were no difference between the plunger that paid off (M1) and the plunger that did not (M2). C1 and C2 were also functionally identical for him; despite the fact that only the left light (C1) signalled the availability of candies and pennies, Raymond's rate of plunger-pulling was the same during C2 as during C1. By the end of the hour, he neither differentiated the plungers nor discriminated the lights.

**Maurice's** 1st hour was, again, different. As soon as the apparatus was turned on, he pulled the left plunger when the left light was on and the right plunger when the right light was on, both at the rates which exceeded his brothers'. Unlike the other children, Maurice did not begin by trying out all possible reflex combinations. A few responses were registered as C1M2 and C2M1, but only because he was responding so rapidly that he "overshot" the light changes. Another unique feature of Maurice's 1st hour was that he suddenly stopped responding a few minutes before the hour ended. The immediate onset and persistence of Maurice's differential response pattern suggest superstitious generalization into the laboratory situation of prepotent behavior acquired elsewhere.

In 1 hr, as Fig. 1 shows, highly individual patterns of behavior emerged in each of the four siblings as they manipulated the same environment. David performed as efficiently as a normal adult (Lindsley, 1958), and Donald gradually acquired differentiation and discrimination but continued to overgeneralize. The other two children failed to show acquisition and behaved in severely stereotyped, but individually distinctive, ways. Throughout the hour, Raymond alternated plungers indiscriminately, while Maurice persisted in pulling the plunger under whichever light was on.

*Repeated measurement*

Earlier as well as recent research (Barrett and Lindsley, 1962; Barrett, 1965a, 1965b) has corroborated the opinion of many clinicians that in a single session a child may fail to show his most efficient or most representative performance. Therefore, we usually present a child with the same program in as many sessions as it takes for his behavior to reach an apparently stable state. That is, we do not change the situation in any way until the child's rate or acquisition pattern ceases to fluctuate unpredictably from session to session. Behavioral fluctuations shown under these conditions are properties of the organism rather than the measurement system.

David, Donald, Raymond, and Maurice remained at the institution long enough for us to schedule seven sessions for each of them. Each child's progress over the seven sessions

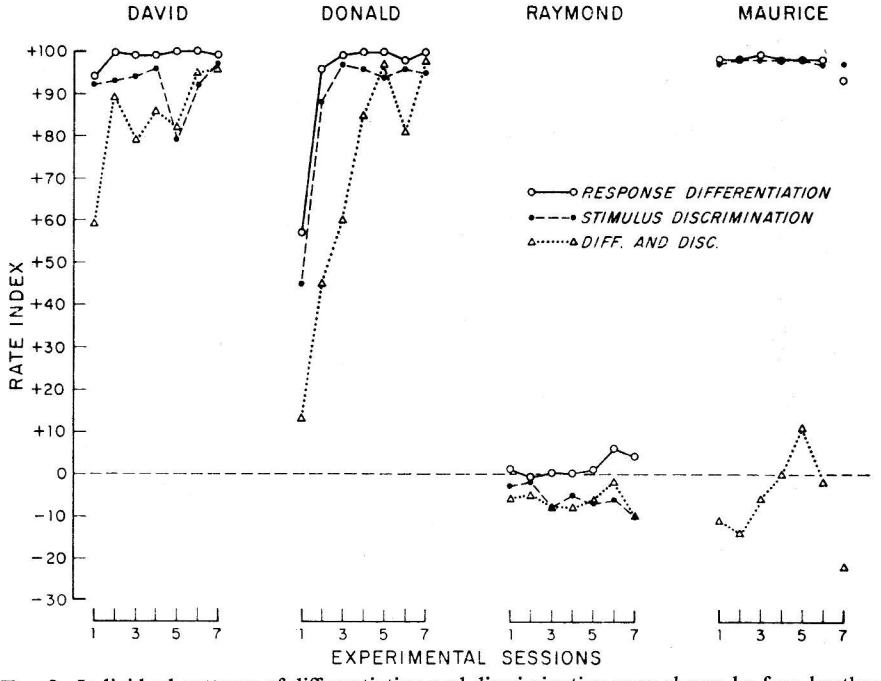


FIG. 2. Individual patterns of differentiation and discrimination were shown by four brothers during seven 1-hr sessions in the same situation* (see footnote* on page 87).

is summarized in Figs. 2 and 3, and the cumulative recordings taken during each brother's last session prior to withdrawal are shown in Fig. 4.

Figure 2 presents rate-index summaries of each brother's seven sessions. The rate index (Jetter, Lindsley and Wohlwill, 1953) quantitates the relationship between the rate of the reinforced reflex (C1M1) and the rate of each of the nonreinforced reflexes (C1M2, C2M1, and C2M2) during each session, and permits direct comparison of the three processes that are analyzed by this method.* By examining these data (Fig. 2) in conjunction with

* The rate index is defined as the difference between two rates divided by their sum. A child's discrimination index for a given experimental session is the difference between his C1M1 rate and his C2M1 rate divided by their sum $\times 100$; his differentiation index is the difference between his C1M1 rate and his C1M2 rate divided by their sum $\times 100$; etc. Absence of differential behavior is represented by zero; maximum differential behavior by $\pm 100$. Positive values represent higher rates of the payoff reflex than of the unconsequated reflex.

the actual number of responses per hour (Fig. 3), we can follow each child's progress in terms of both total behavioral output and the efficiency of that behavior.

**David's** very early differentiation of the two plungers during his first session was sustained throughout all seven sessions, as shown by the high differentiation index in Fig. 2. His discrimination of the two lights, although acquired equally rapidly, was somewhat less stable from session to session. A slight drop in the discrimination index for his 5th session was followed by excellent recovery. Early evidence that he was developing control of overgeneralization was substantiated by his steady improvement during subsequent sessions: his differentiation-and-discrimination index rose steadily (Fig. 2), and his

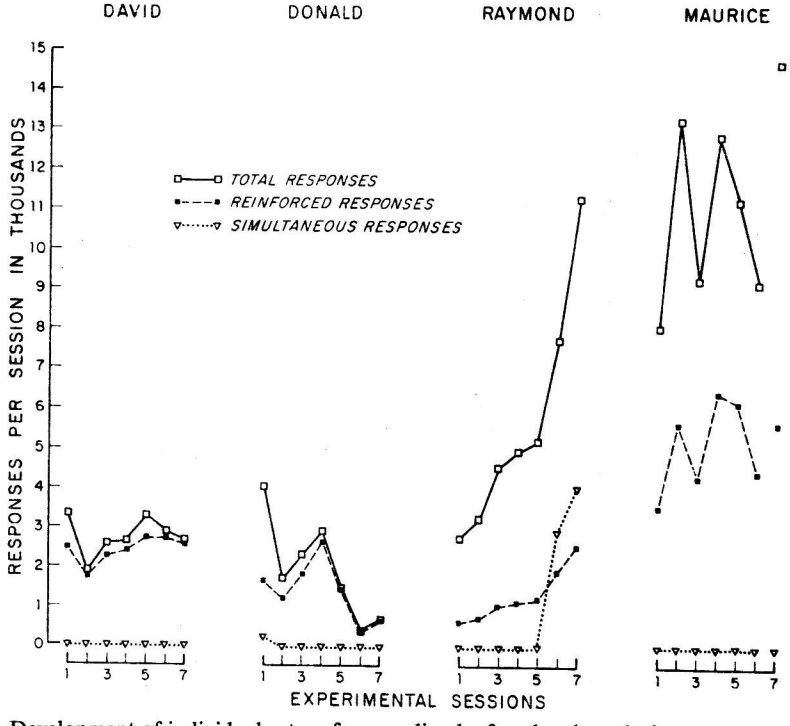


FIG. 3. Development of individual rates of responding by four brothers during seven sessions in an identically programmed environment.*

C2M2 output in the seventh session was limited to a few short periods of activity (Fig. 4). Throughout the seven sessions, his total number of responses per hour remained relatively stable (Fig. 3). The sustained efficiency of his performance was indicated by the very small difference between his total output and his C1M1 output (reinforced responses).†

Evidence of response differentiation during **Donald's** 1st hour was borne out by his subsequent session-to-session performance, which yielded a stable differentiation index (Fig. 2), and by his zero C1M2 rate in session 7 (Fig. 4). Although his early discrimination

* A change in the light configurations, introduced in Maurice's seventh session (see text), did not change his behavior pattern.

† David's rapid and efficient acquisition of productive behavior occurred during four sessions in which he insisted that the door to the enclosure remain ajar. Near the end of the 4th session, our introductory warning to him became a reality when another child ran into the room, began operating the apparatus, and stole some of David's goodies. After this he asked that the door be locked.

appeared less reliable than David's (C2M1, Fig. 1), it ultimately proved to be more stable (less variability in his discrimination index, Fig. 2). Donald's initial failure to control the "plunger-under-light" generalization (high C2M2 rate, Fig. 1) showed gradual improvement until, by session 4, he emitted relatively few C2M2 reflexes. Subsequent intersession variability was shown by a slight drop in the differentiation-and-discrimination index in session 6, but by the seventh session Donald's efficiency was as great as David's (Fig. 4).

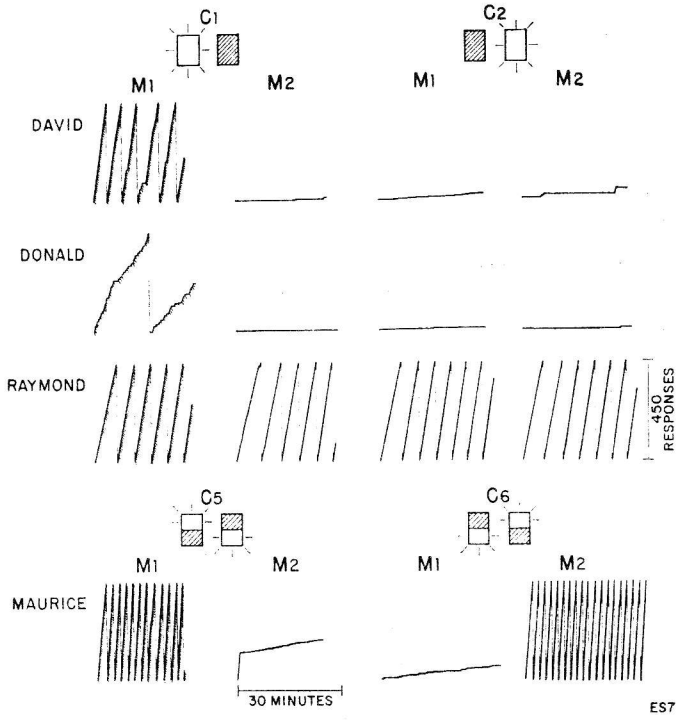


FIG. 4. By the 7th session, stable individuality in manipulating the same environment was shown by four brothers. One brother (Maurice) showed stable behavior despite a change in the light configurations.

Donald's total behavioral output, however, was quite different from David's (Fig. 3). During Donald's last three sessions, nearly all his responding occurred as reinforced reflexes (negligible discrepancy between his total responses and reinforced responses), but his overall rate progressively declined. Beginning in the third session, erratic pausing interrupted his C1M1 responding (Fig. 4). The irregularity within sessions and his declining output may have reflected the effects of Thorazine (see footnote* on page 81) or the difficulty he was supposedly having in adapting to the institution, or it may indicate that pennies and candies were not sufficient to sustain his operation of the apparatus.

In contrast with David and Donald, **Raymond** showed relatively little change over seven sessions. His stereotyped alternation of the two plungers continued unabatedly for five sessions, only to be replaced by a rapidly increasing rate of simultaneous plunger-pulling, irrespective of the light configuration, starting in session 6 (Fig. 3). These non-differential behaviors are reflected in the rate indices which hover around zero in all seven

sessions (Fig. 2). While he acquired neither differentiation of the plungers nor discrimination of the lights, Raymond's output increased dramatically until, in the seventh session, it exceeded 11,000 responses (Fig. 3). His manner of dealing with the environment was to manipulate everything in it, constantly and at an increasing rate. Neither the lights nor the plungers were functionally different for him. Throughout the seven hours, his manner of manipulating the environment clearly distinguished him from his siblings.

Of the four brothers, **Maurice** showed the least change in behavior over seven sessions. His extremely high rate of overgeneralized behavior persisted with only one minor and very transient deviation. Unaware of his imminent departure from the institution, in his seventh session we introduced an environmental change which had successfully eliminated overgeneralization in one of our other children. Split-light configurations, C5 and C6, were substituted for the single-light alternations (Fig. 4). For less than a minute Maurice pulled the M2 plunger at a high rate during C5, then he reverted to his previous pattern at a higher rate than ever. The discrepancy between his total output and the responses that earned him pennies and candies (Fig. 3) was greater than that shown by his siblings. Although his output was invariably higher than his brothers', in 7 hr he showed no signs of learning how to maximize his opportunities for payoff in the environment. The prepotency and persistence of Maurice's apparent "set" was dramatically different from the patterns shown by his brothers. Maurice, like other children who show initial differential or stereotyped behavior in this situation, was very unlikely to have acquired more efficient behavior without our introducing remedial procedures (Barrett, 1965a, 1965b). Furthermore, children like Maurice, who repeatedly fail to test out the existing possibilities for manipulating this particular environment, are far more resistant to remediation than those who try all possibilities and fail to acquire more efficient patterns (Barrett, 1965a, 1965b).

*Possibilities for longitudinal analysis and remediation*

Our laboratory measurements revealed dramatic behavioral differences among David, Donald, Raymond, and Maurice. Each child earned pennies and candies in his own way. Each showed a different degree of acquisition and change during repeated exposure to the same contingencies in the same constant (and relatively uncomplicated) environment. Had we been able to continue our analysis, each brother would have been treated on the basis of *his* performance.

To determine whether **David** could adjust his rapidly acquired, efficient behavior to meet other environmental requirements, we would have given him another problem. For example, we might have delivered pennies and candies only when he operated the *right* plunger when the left light was on.

To sustain **Donald's** operation of the apparatus, we might have programmed a different consequence (e.g. more pennies and less candy), a more demanding contingency (e.g. a penny or candy contingent upon *fifty* C1M1 operations), or perhaps a new problem, such as that suggested for David.

For **Raymond**, we might have altered the response requirement in an attempt to generate differentiation of the plungers. For example, we could have increased the force necessary to operate the nonproductive plunger or required that he make ten correct plunger operations *in succession* to get a goody. Since Raymond failed, also, to discriminate the position differences of the panel lights, we might have changed the color of one of them or combined the alternating lights with recorded instructions, "Pull now" and "Don't

pull". The question is, under what conditions could Raymond have acquired and maintained these basic behavioral processes?

**Maurice's** stereotyped behavior presented still a different problem. It might have been effective to stop dispensing pennies and candies, because in this laboratory situation, a period of total extinction usually produces vigorous but nondifferential activity. If we could have disrupted Maurice's fixed behavior pattern in this way, a more "normal" sequence of acquisition might have emerged when pennies and candies were again given for C1M1 operations. An alternative would have been to try to decelerate his overgeneralized behavior by following C2M2 operations with an aversive stimulus or by prolonging the C2 period whenever a C2M2 operation occurred.

Clearly, the behavioral individuality of each brother would have demanded individually-tailored laboratory procedures—whether our goal were remediation, training, or analysis of current behavioral deficits and abilities.

## CONCLUSION

How can we adapt existing procedures to delineate the variability of latency, direction, magnitude, and duration of the effects of particular variables on an individual's acquisition and maintenance of specific behavioral processes? What manipulations of the external environment or of physiological mechanisms will facilitate the efficiency of a child's behavior? What are the differential effects of such manipulations on different behavioral processes within a child? What behavioral properties are shared by individuals carrying the same clinical diagnoses? What do specific behavioral characteristics prognosticate with respect to specific treatments? These questions reflect the challenge of retarded behavior to educators, habilitators, and basic scientists alike.

In our laboratory, David, Donald, Raymond, and Maurice were given repeated opportunities to manipulate the same environment. We recorded each boy's progress in acquiring differentiation of two plungers and discrimination of two alternating light positions. The children all had the diagnosis of cultural-familial mental retardation, and their developmental histories seemed remarkably similar. But each brother's pattern of acquisition was strikingly individual, ranging in efficiency from that of non-retarded adults to patterns found in children with severe behavioral deficits. Although clinical evaluation did not yield differential habilitative prescriptions for the brothers, their behavior patterns suggested that subsequent analysis and treatment would have to have been different for each of them.

There is no reason to believe that individuality is any less characteristic of man's behavior than it is of his biological makeup. The Familial Retardate may be as much a fiction as the Normal Man. Which one is he: David . . . ? Donald . . . ? Raymond . . . ? Maurice . . . ? More critical is the question: How much can we learn from each? Is it possible that David, Donald, Raymond, and Maurice have been conveniently reduced to points on a single curve defined not by their individualized behavior patterns but by the limitations of our techniques for studying them?

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