

*IMPROVEMENT OF RETARDATE'S MEALTIME
BEHAVIORS BY TIMEOUT PROCEDURES USING
MULTIPLE BASELINE TECHNIQUES^{1,2}*

ELIZABETH SPINDLER BARTON,³ DOUG GUESS, EUGENE GARCIA,
AND DONALD M. BAER

MEANWOOD PARK HOSPITAL, LEEDS, ENGLAND; KANSAS NEUROLOGICAL
INSTITUTE, AND UNIVERSITY OF KANSAS

Undesirable mealtime behaviors of a hospital cottage of retardates were reduced by contingent timeout procedures applied by ward personnel successively to one undesirable behavior after another, in a multiple baseline design. In some cases the timeout procedure was to remove the subject from the room until the meal was finished; in other cases (depending on the health of the child and the initial rate of the behavior to be reduced), timeout consisted of a 15-sec removal of the child's meal tray. Undesirable behaviors were defined as stealing, using fingers inappropriately, messy use of utensils, and pigging (eating directly with mouth or eating spilled food). Timeout was applied to these behaviors in that order, and in each case led to a marked and useful reduction in the behavior throughout the group. As these undesirable behaviors were reduced, more appropriate mealtime behaviors emerged: as inappropriate use of fingers declined (under contingent timeout), messy utensil behavior increased; later, as messy utensil behavior declined (under contingent timeout), a defined category of neat utensil behavior increased. Weights of the subjects were monitored steadily throughout the study and showed essentially no change.

Disruptive behavior and undesirable styles of eating are common among severely retarded children, especially in group settings under minimal supervision. Procedures to reduce the frequency of such mealtime behaviors among institutionalized retardates are especially needed. Disruptive eating habits can place an excessive burden on ward attendants (who often find themselves inadequately prepared to deal with these problems), and un-aesthetic table manners probably ensure that a retardate will be considered more as an animal and less as a child by those who watch him.

Within recent years, operant procedures have been used to reduce undesirable mealtime behavior, and to train more appropriate eating styles in retarded children. Various

forms of mild punishment have been used to reduce inappropriate mealtime behavior, such as timeout from the meal (Hamilton and Allen, 1967), physical restraint (Henricksen and Doughty, 1967), and removing the child's food for short periods of time (Blackwood, 1962; Whitney and Barnard, 1966). An alternative procedure (Lent, 1967), eliminated food stealing by reinforcing non-stealing and removing reinforcers for stealing.

Thus, these studies suggest that mild punishment can be used to improve eating behavior among the severely retarded. However, of the studies reviewed, only one (Lent, 1967) demonstrated experimental control of the treatment (using a reversal technique).

The present study reports a feeding program using timeout techniques in a ward of severely and profoundly retarded children, adolescents, and young adults. The research design involved a multiple-baseline technique (Baer, Wolf, and Risley, 1968) both to demonstrate the function of the timeout variable and to further an analysis of various response components of undesirable mealtime behavior.

Subjects and Setting

The 16 subjects were male residents of a cottage at the Kansas Neurological Institute. Their ages ranged from 9 to 23 yr. All subjects fell within the A.A.M.D. classifications of

¹Reprints may be obtained from Douglas Guess, Kansas Neurological Institute, 3107 West 21st Street, Topeka, Kansas 66604.

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³This study was conducted while the senior author was a member of the Psychology staff of the Kansas Neurological Institute.

severely and profoundly retarded. Hand coordination was near normal except for two severely spastic subjects; hearing was normal in all but two, and speech was uniformly absent.

The residents ate their breakfast, lunch, and dinner in two adjoining 12 by 12 ft (3.6 by 3.6 m) dining rooms connected by a 3 by 4 ft (0.9 x 1.2 m) open window in a common wall. Each subject was assigned a regular seat in one of the two rooms, four subjects in each room. Meals were served in two shifts of eight subjects each, the second shift immediately following the first. (These arrangements were initiated specifically for the training program. Previously, residents had their meals as a group in a large room.) Food was placed on the table in cafeteria trays, before the subjects entered. Each tray contained bread, milk, and assorted foods in two or three different dishes. Spoons were provided for all subjects. (Forks were occasionally given as well, but to no more than six of the subjects.) A 6 by 8 ft (1.8 by 2.4 m) bare room approximately 20 ft (6 m) from either dining room was used as a timeout room. From two to four (usually three) cottage attendants were present during these meals.

Observation

Preliminary observation led to the following definitions of mealtime behaviors to be recorded:

1. *Stealing*: removal of food or other object from another resident's tray
2. *Fingers*: eating food (from a dish) with fingers (excepting use of fingers to hold hamburger buns, bread, rolls, potato chips, celery sticks, and other foods "properly" eaten with fingers).
3. *Messy utensil*: pushing food off dish with utensil, using fingers to place food on utensil, spilling food off utensil or cup en route to mouth, or using utensil with face closer than 2 in. to the dish.
4. *Neat utensil*: use of utensil to eat, excluding those behaviors defined as "Messy Utensil."
5. *Pigging*: eating food spilled on table, floor, clothing, or own tray; and eating food by placing the mouth directly on it (without use of fingers or utensil).
6. *Other behavior*: engaging in behavior not defined above (requesting, being

taught to use spoon, appropriate use of fingers, and being timed-out).

7. *No behavior*: absence of gross behavior, e.g., looking about, sitting quietly, chewing or swallowing.

The above seven categories of behavior were mutually exclusive, and functionally exhausted all behavior seen in the situation. Of these seven, three—Stealing, Fingers, and Pigging—were defined as "Disgusting" because of their effect on aides and other spectators.

Observations were made during the noon and evening meals, beginning only when all subjects were seated, and ending when the last subject had finished his meal. Each subject was observed until one of the defined behaviors occurred, or for 10 sec; however, "No Behavior" or "Other Behavior" were recorded for a subject only after 10 sec of observation had failed to produce a different recording. Subjects were observed in turn, starting with the resident who had been seated first and continuing once around the table in clockwise fashion. The observer then recorded the behavior of the subjects seated at the second table, in the same manner; he then returned to observe the first table again. Usually, each subject was observed between six and 12 times per meal. Slow eaters typically were observed more often per meal than fast eaters, who could leave the dining room upon finishing their meal.⁴

From this time-sampling procedure, the percentage of occurrence for each class of behavior was computed for the entire group, by dividing the recorded instances of each class across all subjects by the total number of all recorded observations across all subjects, then multiplying by 100.⁵ During seven meals of the

⁴However, near the end of the study, all subjects were encouraged to remain in their seats until everyone had finished his meal, the entire group then leaving the dining rooms as a body. Thus, the final group data of the study are based on nearly equal numbers of observation of each child.

⁵Suppose, for example, that at a given meal 10 children were observed nine times each before leaving the room, four more were observed 10 times each, and two more were observed 11 times each. A total of $10 \times 9 + 4 \times 10 + 2 \times 11 = 152$ observations would have been recorded. If 15 of those observations were "Fingers", then the per cent of occurrence for this category would be $15/152 = 10\%$. The number of subjects contributing to these 15 "Fingers" recordings might have

study, and at least once during each experimental condition, a second observer made a simultaneous record. Comparison of these two records, subject by subject, and interval by interval, allowed computation of a percentage of observer agreement.

An ongoing daily record of timeouts from meals was kept throughout the experimental conditions by the ward attendants. Body weights of each subject were recorded at monthly intervals.

Procedure

After a baseline condition with no experimentally imposed contingencies, a sequence of timeout conditions was made contingent on the following behaviors in the order listed.

Stealing. The subject was removed from the meal by the cottage attendants and placed in the timeout room immediately following any Stealing response observed by any attendant(s). All subjects removed were placed in this room and kept there for the remainder of the meal. These subjects' trays were removed from the table. In most cases it was sufficient merely for the cottage attendant to call a child's name when he was being timed-out, and lead him to the timeout room. It was necessary to pull a few subjects from the dining area to the timeout area, occasionally requiring two cottage attendants.

Fingers. With the preceding timeout condition remaining in effect, each member of one group of 11 subjects was removed from the meal and placed in the timeout room immediately following any Fingers response (timeout from meal). For a second group of five, each subject had his tray removed for 15 sec immediately following Fingers response (timeout 15-sec.). This second group received the 15 sec. timeout because the nursing staff was concerned that timeout from the entire meal might jeopardize these subjects' health. Also, a shaping procedure was initiated for three subjects who had not used utensils previously, two of whom had motor impairments affecting their hand coordination. Special large-handled spoons were given to these subjects.

Messy Utensils. With all the preceding time-

out conditions remaining in effect, a 15-sec tray removal immediately followed any instance of Messy Utensil use. The 15-sec. timeout rather than timeout from the meal was used in expectation of many repeated contingencies being necessary to eliminate this frequent behavior.

Pigging. With all the preceding timeout conditions in effect, a 15-sec tray removal immediately followed any Pigging response. Again, the 15-sec timeout was used in the interests of efficiency.

Before each condition, the experimenters met with cottage personnel and identified the specific behavior to be timed-out. The experimenters also served as models for the initial few meals in each condition, working with the cottage attendants to apply the contingencies. A large sign was attached to the wall of the dining area, indicating what contingencies were in effect that day for each subject. Monitoring the attendants' use of these contingencies was accomplished in the course of time-sampling the subjects' behaviors cited for timeout.

Each change in conditions was determined by the overall stability of the data already recorded. Data were collected five days per week during lunch and dinner, but the contingencies described above were in effect during all three meals of each day of each condition, without exception. The study lasted six months.

RESULTS

Inter-observer agreement for each of the seven meals during which observer reliability was assessed ranged from 86 to 95% with a mean of 90%.

Figure 1 represents the percentage of observations of the seven defined classes of mealtime behavior, and the total percentage of the three behaviors defined as "Disgusting" (Stealing, Fingers, and Pigging), for the total group throughout the study. The beginnings of the successive timeout conditions are indicated by vertical lines, with horizontal arrows denoting the temporal span of each condition. Figure 1 shows that each successive condition of timeout led systematically to a decrease in the behavior(s) being manipulated. Thus, Stealing was relatively high during baseline, but it decreased steadily during the timeout procedure until reaching zero. Fingers and

been as low as one or as high as 15, but this number was not reflected in the score, which was intended to display the behaviors of the group as a whole.

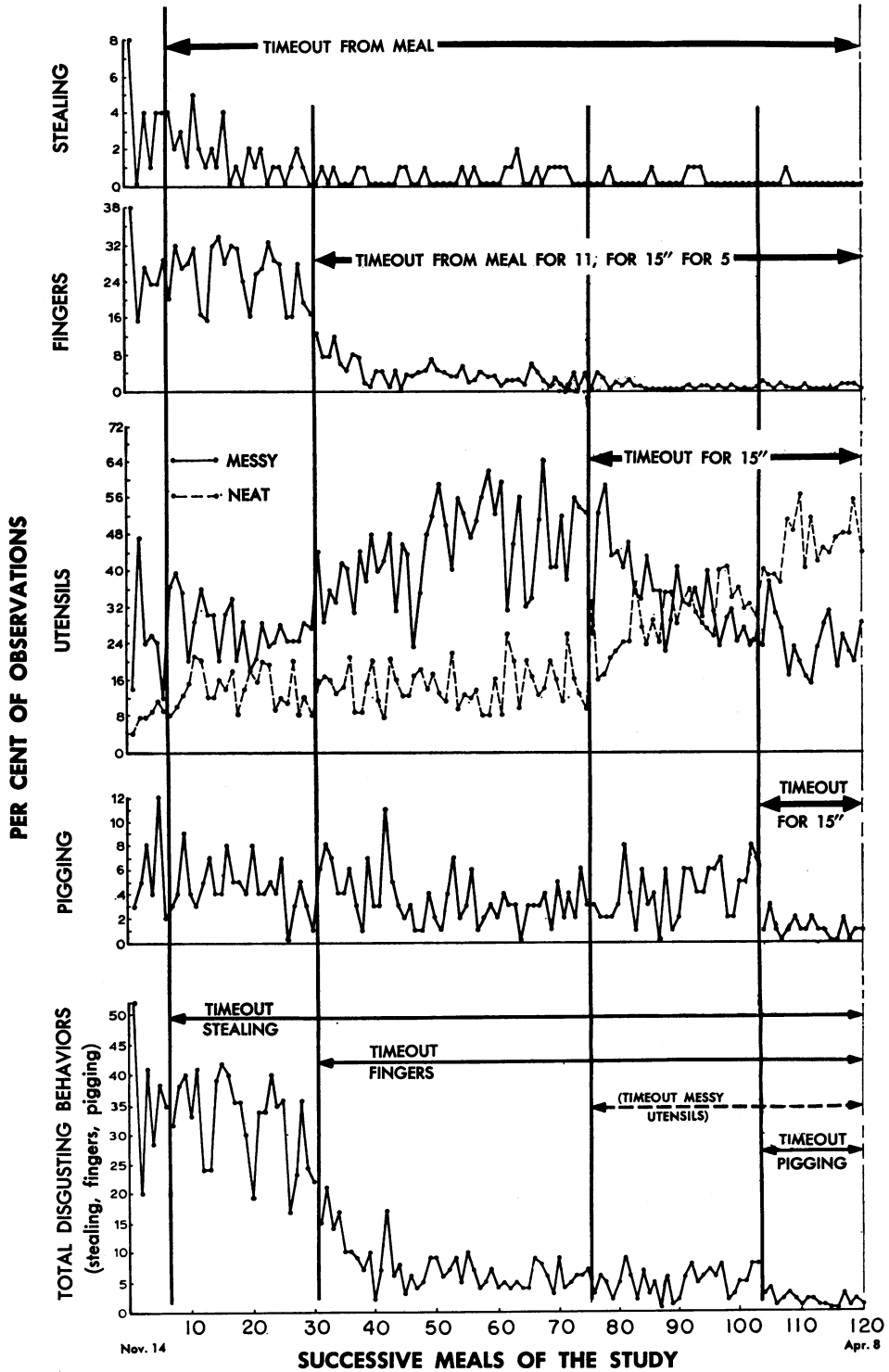


Fig. 1. Concurrent group rates of Stealing, Fingers, Utensils, and Pigging behaviors, and the sum of Stealing, Fingers, and Pigging (Total Disgusting Behaviors), through the baseline and experimental phases of the study.

Pigging meanwhile remained relatively stable, until timeout for each was imposed; both behaviors fell abruptly and then steadily decreased to near-zero. Messy Utensils remained stable during the Baseline and timeout for Stealing conditions, but a significant increase of this behavior was observed when subjects were timed-out for Fingers. However, timeout for Messy Utensils then produced the usual decrease in this category. Neat Utensils, which had remained consistent throughout the previous timeout manipulations, increased when timeout for Messy Utensils was imposed, gradually replacing Messy Utensils in relative frequency. The percentage of Total Disgusting Behaviors decreased across successive timeout conditions, from a baseline mean of 36% to generally less than 5% during the final meals of the study.

Figure 2 shows the effects of the two timeout conditions imposed for Fingers, and also the percentage of observations for No Behavior and Other Behavior. Both the timeout of 15 sec and the timeout from the meal effectively reduced the relative frequency of Fingers responses; a resulting low level of near-zero was maintained during the final 40 meals of the study.

The percentage of observations in which No Behavior was recorded showed a gradual decline across successive meals of the study. Other Behavior showed a very slight, highly variable increase throughout the study.

Figure 3 tracks the total number of timeouts per day, as recorded by the ward attendants, for successive days of the study. The solid line depicts the number of subjects removed from the meal for Stealing; the broken line represents the number of those 11 subjects who were removed from the meal for Fingers. The number of subjects timed-out for each of these conditions shows an abrupt decrease, which levels off and remains fairly constant for the remainder of the study.

The weights of the 16 subjects participating in the program, measured at monthly intervals during the course of the study, are represented in Fig. 4. The mean weight of the group remained unchanged throughout the six-month period. The child who weighed least at the start of the program (lower limit) showed a slight gain in weight during the study; the child who initially weighed most (upper limit) also gained weight over the six-

month period. The subject who lost most during the course of the study (10 lb.) is also compared to the subject gaining the most weight (8 lb.). Neither shift was large.

DISCUSSION

The exact function of the timeout procedure, whether it is a form of simple extinction or a punishing event, remains an area of ambiguity pending further experimental analysis (Leitenberg, 1965; Sherman and Baer, 1969). Nevertheless, accepting Azrin and Holz's (1966) functional definition of a punishing stimulus, the timeout conditions used in the present study can be defined as punishers: the percentage of occurrence of each undesirable behavior was successfully reduced when the timeout contingency was applied to the behavior. Experimental control of the timeout variable was demonstrated through the successive but temporally separated application of the timeout contingency to those behaviors defined as Stealing, Fingers, Messy Utensil, and Pigging. The baseline occurrence of each of these behaviors remained relatively unchanged until that point in time in which the timeout consequence was applied, thus diminishing the possibility that such changes occurred by chance. This "multiple-baseline" technique (Baer, Wolf, and Risley, 1968) is especially useful when the behavior appears to be irreversible or, as in the present case, when reversing the behavior is undesirable.

Further analyses of the data indicate that both the 15-sec timeout and timeout from the entire meal were successful in reducing inappropriate eating behavior. However, an exacting comparison of the two procedures cannot be made from the present design, inasmuch as each timeout contingency was applied to either different behaviors or different subjects. A more accurate comparison of the two procedures would have been possible had both timeout contingencies been alternated across one behavior with the same subjects. For Stealing, however, timeout from the total meal would probably be the more effective contingency, since removal of the child's tray would probably encourage the behavior (at least without prior association as a punishing stimulus for other behaviors).

The continued decrease of each behavior across successive meals indicates that the rela-

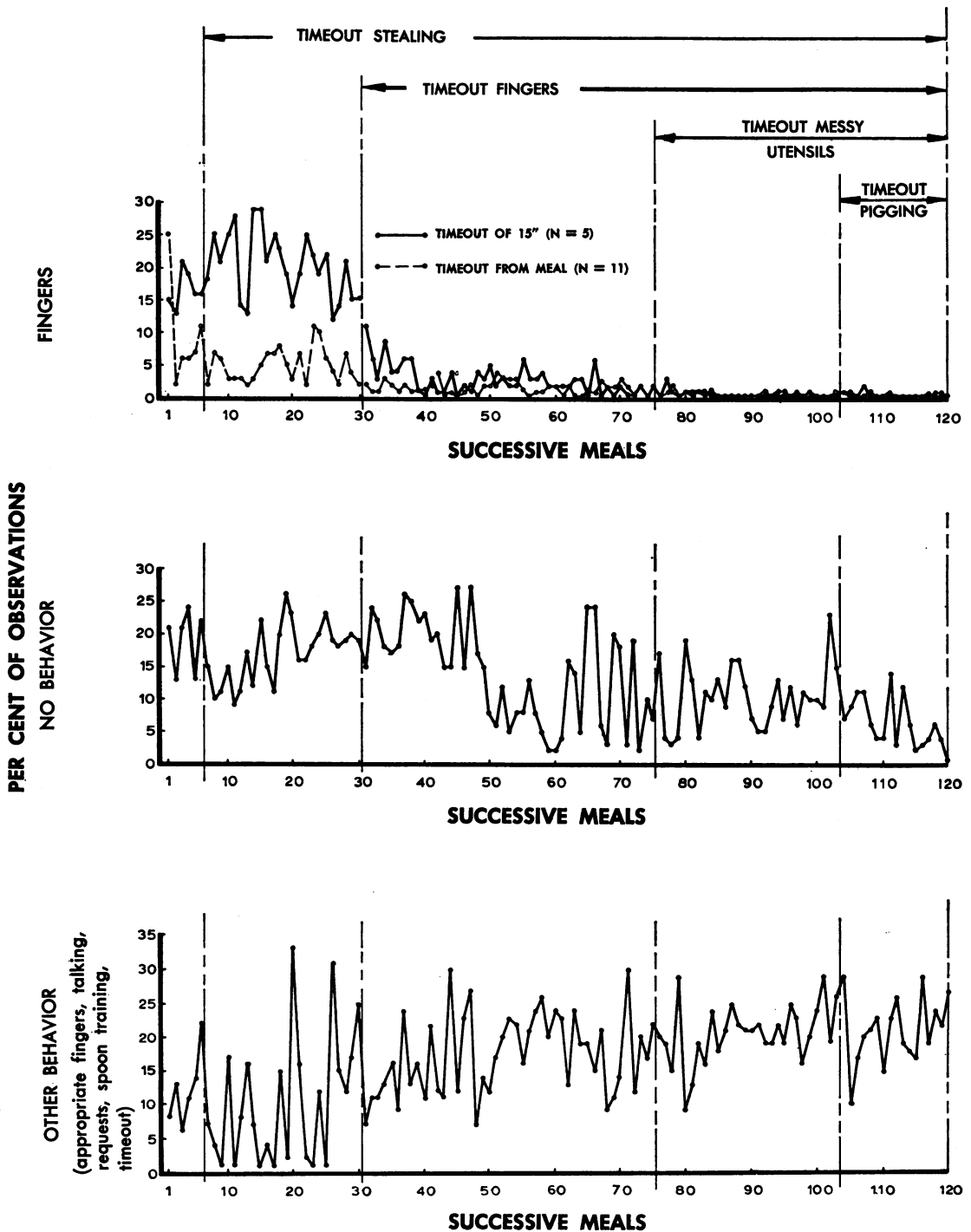


Fig. 2. Concurrent rates of Fingers behavior for two subgroups of the cottage (representing two forms of timeout), and of No-Behavior and Other-Behavior categories for the total cottage, through the baseline and experimental phases of the study.

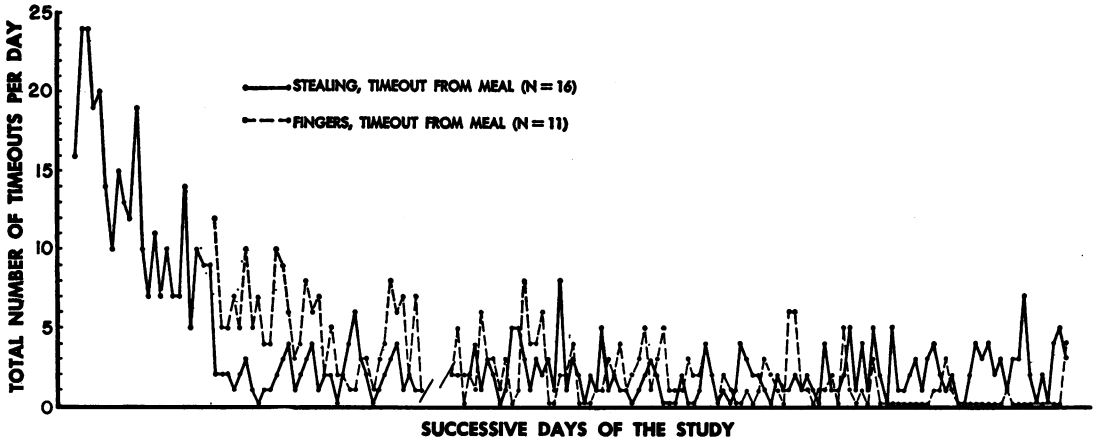


Fig. 3. Cottage attendants' records of the number of timeouts from the meal required throughout the study.

tive reduction of the behavior may be a cumulative function of the timeout consequence and the length of time it is in effect. As shown in Fig. 1, the timeout contingency usually produced an abrupt deceleration of the be-

havior, which then continued to decline steadily across meals. From an applied point of view, one might well initiate timeout's for various behaviors more rapidly than in the present study. Similarly, it is likely that each new timeout contingency produces the desired effect more rapidly as a result of cumulative prior timeout conditions. This, again, is difficult to evaluate in the present design, due to the apparent differences in the behaviors under study.

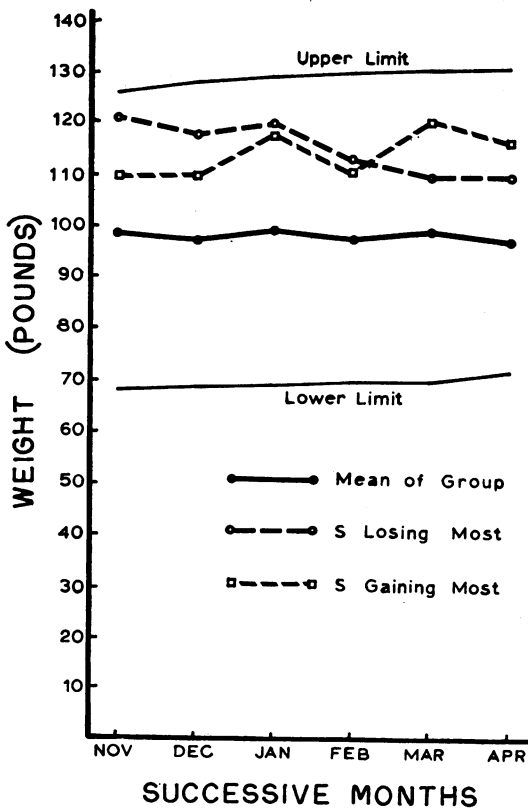


Fig. 4. Monthly average and extreme weights of the cottage subjects throughout the study, and the course of weight change for the two subjects showing greatest gain or loss.

The increase in Messy Utensil (Fig. 1) following timeout for Fingers was an expected change, and represented more appropriate eating behavior among the subjects. Time-out for Messy Utensil was followed by a subsequent decrease in this behavior and a concurrent acceleration in Neat Utensil. Thus, the increase of the desired behavior, Neat Utensil, was obtained without placing a direct contingency on it.

The general decrease in No Behavior across successive meals of the study probably reflects a generally improved mealtime climate where more time was spent by the subjects in appropriate eating behavior. Although data were not available, it was observed that the residents were spending more of their time eating, especially in the slower forms required by Neat Utensil behavior, as the study progressed. (Before the first timeout operation, the subjects tended to eat rapidly before their food was stolen; the remainder of the meal then was spent sitting or engaging in a number of inappropriate behaviors: wandering, head banging, self-stimulation, tantrums, fighting, and throwing of uneaten food.)

The fact that no significant weight losses occurred among the subjects during the study is significant from a practical point of view. (The one subject who lost the most over the six-month period (10 lb) had already been placed on a reduction diet by the medical staff because of overweight.)

It should certainly be pointed out that the cottage attendants were those persons who were primarily responsible for implementing the treatment procedures. Unusually high morale was reported to have been maintained by the cottage personnel over the six-month study period, probably because of the improved eating behavior of the 16 residents. Although the cottage personnel appeared generally disinterested in the graphs depicting progress, they seemed most pleased with favorable comments by parents, other cottage attendants, and other professional staff members. Most likely, however, the simple and straightforward training procedures that enabled them to gain and maintain control over the mealtime behavior of the residents and the very noticeable improvement made by the subjects was largely responsible for the success of the program.

Since results of this study were made available to the institution, three other cottages have implemented similar feeding programs that were initiated and are being maintained by persons other than those participating in the present study.

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