INCREASING RURAL HEAD START CHILDREN'S CONSUMPTION OF MIDDLE-CLASS MEALS¹

CHARLES H. MADSEN, JR., CLIFFORD K. MADSEN, AND
FAITH THOMPSON

FLORIDA STATE UNIVERSITY AND
LEON COUNTY SCHOOLS, TALLAHASSEE

Rural black, economically impoverished Head Start children, whose normal diets were deficient in nutritional requirements, were not consuming the nutritional breakfasts of, to them, unfamiliar foods provided by the county school system. This study investigated a positive simple method to increase the amount of food consumed and thereby ensure proper nutrition. Teachers dispensed sugar-coated cereal and small candies paired with praise contingent on eating behaviors and rewarded children who finished the entire meal with additional treats and praise. Substantial increases were produced in the proportion of meals consumed and in the number of children observed engaged in eating behaviors. These simple traditional behavioral procedures are readily available for any staff working with economically impoverished children as one method of increasing their sampling and consumption of unfamiliar nutritious foods.

The relationship between physical problems and academic learning is acknowledged repeatedly by professionals in special education (e.g., Dunn, 1963). This relationship is, of course, apparent at the extremes of physical incapacitation. However, problems faced by seemingly "normal" youngsters who are only minimally undernourished are seldom noted by the regular classroom teacher. Yet, comments regarding tiredness, inability to concentrate, or general apathy may indicate behavioral deficits

related to undernourishment. This is especially salient when dealing with some of the economically impoverished children in Head Start.

Problems concerned with encouraging children to eat "the proper, most nourishing food" probably receive attention in almost every family. However, systematic investigation concerning effective behavioral methods of encouraging eating behaviors have primarily dealt with extreme problems of institutionalized children (e.g., Spradlin, *unpublished*; Whitney and Barnard, 1966). A local Head Start program, which included economically impoverished rural black youngsters, provided a situation where an investigation using simple behavioral procedures to increase intake of available nourishing food was possible. Initially, it was conjectured that these rural youngsters had not had the opportunity to eat the "common middle-class food" prepared by the school system dieticians and perhaps "eating problems" were not so much the result of previously developed dislikes but rather unfamiliarity with the prepared foods. Visits to the children's homes, which included observations of food preparation and food on hand, indicated youngsters were unaccustomed

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to eating the "common nourishing foods" included in their Head Start menus.

The value question of whether youngsters should be given nourishing foods that are within their repertoire of experience, as opposed to being induced to eat a more "middle-class diet", was not within the province of this investigation. These particular Head Start youngsters were in school and the only food available was prepared by the county kitchen and transported to the school. The question facing the investigators was one of how best to teach these children to consume the food available.

Child development investigators indicate that based upon self-reported data, most parents may encourage children who have eating problems by using essentially disapproving techniques (e.g., Sears, Maccoby, and Levin, 1957). Some parents nag, cajole, or punish noneating, and at times may attempt to force-feed. It is conjectured that negative methods may actually serve to stimulate children physiologically, decrease the desire for food intake, and thereby circumvent their intended purpose. This study was designed after an advanced educational psychology class discussion during which one of the class members who was teaching in a local school reported that "one school employee (black) had been seen trying to pour milk down the throat of a Head Start youngster (also black) for '*his own good*'". This behavior was terminated by one of the authors, who happened to walk into the dining room. She then procured some candies and rewarded this same child for (1) holding the container, (2) raising the container to his lips, (3) taking a little swallow, etc. (i.e., shaping milk-drinking behavior). The class determined to design a project that would help these pupils eat more of the balanced diet available to them. The class was studying positive approaches based upon behavioral principles (see Madsen and Madsen, 1972, for a description of the content of this course) and determined as a project to use appropriate positive methods to teach the children to consume the available foods.

METHOD

Subjects

Forty-six rural black children (mean age = 6 yr, 2 months) enrolled in a summer Head Start program (W. T. Moore Elementary School, Leon County, Florida) served as subjects. The family income for all children was below the poverty standard established by the federal government. The average body weight of the children was approximately 4 to 6 lb under the indicated minimum for height and age. Observations in the homes of the youngsters indicated the most frequently consumed foods were cornbread, beans, bread, lard, and collard greens.

Setting

Walter T. Moore Elementary School is in rural Leon County, Florida (eight miles from Tallahassee, Florida). The school consists of a number of large open learning centers. Normally, students are instructed by four teachers in a large carpeted, acoustically tiled learning center. The center (1200 square feet) consists of four learning sections (two at each end). Individual student tables and a variety of common kindergarten materials were located in each section. A common center area was bounded by two bathrooms and an outside door on one side and a teacher's preparation room on the other. The dining area (cafeteria) is a carpeted area with a stage at one end and food pick-up and dirty food tray drop-off stations at the other. The weighing scales for food consumed were located between the two food stations and consisted of a laboratory scale calibrated in grams.

Breakfast Meal

Measures of food eaten were calculated during the breakfast meal (8:30 to 9:15 a.m.), which was constant across all conditions. Parents were instructed not to feed their children before they left for school. The precise number of children who came to school without breakfast was not ascertained.

Meals were prepared by the central kitchen of the county schools and transported to the school. The dispensing and sealing of food was accomplished mechanically. Therefore, the daily weight for each individual's meal was virtually identical. The meals, which varied slightly in weight from day to day, averaged approximately the same during each condition of the experiment.

Meals included scrambled eggs, sausages, bacon, ham, toast, jelly, milk, juice, pancakes, waffles, *etc.* With the exception of bread, none of the items prepared for the consumption of the youngsters was within their normal eating experience.

Food Measures

The amount of food eaten (in grams) by each individual child was determined by weighing and recording the food and the child's tray (including liquids) before eating. When the child finished eating, the tray was taken to the weighing station and again weighed and recorded. The weight of clean trays and containers was subtracted before determining weight of food eaten. The postweight was subtracted from the preweight to determine the weight of the consumed food. The average amount of food eaten by the entire group was determined by summing all individual weights and dividing by the number of children in attendance at the breakfast meal. The number of children varied from day to day because of absences (daily average = 35.4). Daily records were standardized in percentages by converting the total grams eaten to a percentage of the meal consumed. Percentage scores for individuals represent the percentage of total food available that was actually consumed ($\text{Pre} - \text{Post} = \text{grams consumed}$; $\text{grams consumed} \div \text{Preweight} = \text{Percentage of food consumed}$). The average percentage of food consumed for the entire group for each day was computed by summing the total number of grams consumed for all subjects and dividing by the summed

gram total available for all subjects (total pre-eating weights).

Food was weighed before eating by two experimenters who took the tray directly from the kitchen personnel and weighed it before handing it to one of the Head Start children. Post-eating weights were accomplished by requiring all children involved in the study to return their trays to the weighing table where they were weighed before placing them in the dirty tray section. Both experimenters agreed as to the weight reading before the weight was recorded.

Behavioral Observations

Behavioral observations were taken during the first 15 min of the breakfast meal during 15 of the 18 days when the study was in effect. Eating behavior was defined as: (1) movement of food from containers into mouth by hand, spoon, fork, or knife, (2) movement of liquid into mouth *via* any available container, and/or when (3) food was actually observed in the mouth. Observers did not record eating when the child was manipulating either food or utensils or when the child was chewing unless food was actually observed in the mouth or observed being placed in the mouth immediately before the observation of chewing (this latter category was developed before the experiment, as it was thought that during the reinforcement phase some of the children might pretend to be eating without having placed any food in their mouths).

Observers used an observational sheet divided into four blocks (15-sec intervals) for each minute and numbered from one to 15 for 15 min of observation. Seven or eight children were seated at each cafeteria table. For purposes of observation, each of the two observers watched two tables of children for 15 sec, scanning the children each 15-sec period. During the 15 sec, observers counted the number of children observed engaging in eating behaviors and at the end of the 15-sec period recorded the number of children observed eating. Each child was recorded only once during each interval. Each

observer changed to a new set of tables every 15 sec.

Reliability of eating behaviors. Observers had 60 intervals of observation per day. To compute reliability, two observers watched the same two tables of children during 12 of the 60 observation intervals. Reliability was computed by comparing both observers' records of the number of children eating during each interval and dividing the larger number into the smaller ($\times 100$). Average reliability was 97% (range 92 to 100% per meal).

Conditions

Baseline I. Initial recording included proportion of meals consumed and the percentage of children observed engaging in eating behavior per observed interval. Interaction between teachers and students was minimal and no teacher was observed to give praise or encouragement for engaging in "eating behavior" or finishing the prepared meals.

Reinforcement I (approval). The four teachers who were working with the children were instructed to circulate around the cafeteria praising and giving sugar-coated cereal to children contingent upon engaging in eating behavior. Teachers were reminded to "catch the children being good" and pair immediate treats with verbal praise. The teachers used such praise comments as: "You're eating well today, Johnny; here is a treat for putting your food in your mouth"; "Sally, you're tasting those eggs this morning; that's very good, here's a treat"; "William, it makes me proud and I'll bet you feel proud, too, when you drink your milk like that; here's a treat"; "Children, look at Suzy, she gets a treat for eating her bacon". Another aspect of the approval phase involved giving a special reward to each child who finished the entire meal. This procedure was explained to the children and they were told that the students who finished all the food would receive five small candies. Students were also given verbal praise paired with the candy (e.g., "Al, you finished, that's a big boy, here's your candy, etc"). Pre-

vious pilot work indicated that no child would refuse either sugar-coated cereals or small candies when presented noncontingently (32 children).

Baseline II. Teachers were instructed to continue to circulate among students, to say nothing, and discontinue reinforcement. It was noted that teacher-student breakfast interaction was almost nonexistent during Baseline II, comparable to Baseline I.

Reinforcement II (approval). The same approval procedures in effect during Reinforcement I were reinstated for the remainder of the study.

RESULTS

The results of this experiment indicate a very clear difference between the baseline and approval reinforcement conditions in both the number of children observed engaging in eating behavior at any time and the proportion of the meal consumed. The praise and treats delivered contingent upon eating behavior markedly increased the proportion of children observed eating during any 15-sec period (Figure 1). During baseline conditions, an average of 20% of the children engaged in eating behavior, while 33% were eating during reinforcement conditions.

The increase in eating activity was correlated with an increase in the proportion of the meal consumed, from an average of 76% of the meal during baselines to 93% during reinforcement (Figure 2). Each child consumed a greater proportion of meals during the reinforcement conditions except for one child who consumed approximately 87% under both conditions. The child who showed the greatest gain consumed 34% of his meals during baseline conditions and 79% during reinforcement. Data for all 46 children indicate that 78.3% increased their food consumption by more than 10% during reinforcement (36 of 46). The four children who consumed an average of less than half of their meals during the first baseline condition

Fig. 1. Average per cent of children observed to be "eating" in each 15-sec observation interval during the breakfast meal each day.

showed greater than a 40% increase in the first reinforcement condition and increased the gain during the second reinforcement condition.

DISCUSSION

The present study was directed toward increasing eating. This goal was accomplished by using a variety of reinforcers to increase food intake. The results indicate that food intake can be increased with special food reinforcers plus praise. The changes in food intake are probably quite important when it is realized that the average child was eating almost one-fifth more during reinforcement conditions.

Generally speaking, in child-care centers "eating a balanced diet" and "learning about new foods" are basic goals of the professionals and

dietitians concerned; they are less concerned with the proportion of meals consumed. However, during the reinforcement conditions, the children were eating over 90% of the food on their trays and therefore were probably eating a balanced diet as well as consuming more. However, further research that includes measures of the precise foods sampled and proportion of each food eaten by each child is needed to answer this question.

It was anecdotally reported by teachers that many of the children reported that they "liked" the food during the last week of the experiment. It should be remembered that the food consumed at home was very different in type as well as in nutritional quality and quantity than that prepared for the school. The question of how long reinforcement procedures would be

Fig. 2. Average per cent of breakfast meal consumed by all children present each day.

necessary before breakfast would be consumed without reinforcement needs further investigation.

The combination of desired food plus praise as incentives increased the food intake of rural, economically impoverished black youngsters when the only food available was a typical "middle-class dietician's menu". Increased food intake probably ensured the sampling of new foods and a nourishing breakfast for almost all of the children. The combination of simple behavioral procedures used here are readily available for preschool staffs working with economically impoverished children as one method of increasing dietary nutrition when the learning of the children has not included experience with the particular food available.

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