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## **Eating Behavior of Obese and Nonobese Mentally Retarded Adults**

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An obese group and a nonobese group of moderately mentally retarded adults were identified through use of body weight and tricep skinfold thickness measures. Subjects were observed individually in a sheltered workshop cafeteria during their normal lunch period. A variety of eating behavior measures were obtained. Results indicated that the obese retarded subjects did not differ from their nonobese peers in eating rate, total meal time, or caloric intake. Large variability was observed in the measures for both groups. Implications of these data for behavioral treatments of obesity and the need for alternative explanations of an obese condition were discussed.

Behavioral approaches used to treat obesity of nonretarded (Stuart & Davis, 1972) and mentally retarded populations (Rotatori & Fox, 1981) have been based largely on the assumption that overweight is the result of faulty eating habits that lead to excessive food consumption (Wooley, Wooley, & Dyrenforth, 1979). Researchers attempting to identify a distinct eating style of obese persons (see review by Stunkard & Kaplan, 1977) have produced dissimilar or even contradictory findings. The growing consensus from these and other investigations is that the small and inconsistent differences occasionally found are of "doubtful relevance in determining the cause and control of obesity" (Stunkard, Coll, Lindquist, & Meyers, 1980, p. 1129). In contrast a distinctive eating style has been reported for obese children (Keane, Geller, & Scheirer, 1981). Surprisingly, these types of investigations have not been extended to the retarded population for whom obesity represents a prevalent condition (Fox & Rotatori, 1982). Such studies are critical for the ultimate development of maximally effective treatment packages for retarded individuals. In the present paper we have described a study of the eating behavior of retarded adults identified as obese or nonobese. Stunkard et al. (1980) recommended that such studies be carried out

under naturalistic conditions because eating behavior is strongly influenced by situational variables. As such, the present study was conducted during the normal lunch period in the subjects' sheltered workshop cafeteria.

The case managers of a sheltered workshop for retarded adults were asked to identify subjects who were visibly obese or nonobese and who did not have any significant physical limitations (e.g., blind, limited use of upper extremities). Each case manager provided clients from their case loads, yielding a fairly representative sample of 42 potential subjects from a workshop population of 200. Two experimenters independently measured each subject's tricep skinfold thickness using a Lange caliper. Agreement between experimenters on the skinfold measures was high,  $r(40) = .99, p < .001$ ; experimenters never deviated from each other's measures by more than 4 mm (mean deviation = 1.4 mm, mode = 1.5 mm). Subjects were also weighed and measured. Obesity was defined as tricep skinfold thickness at least 25 mm for males and 31 mm for females (95th percentile; Frisanch, 1974) and body weight at least 20 percent above desirable weight for both sexes (Robinson, 1972). Fourteen subjects (5 males, 9 females) met or exceeded both criteria and comprised the obese group.

Fourteen subjects (6 males, 8 females) fell below both criteria and comprised the nonobese group. The 14 remaining subjects were eliminated for not meeting the selection criteria. Subject data for each group is shown in Table 1.

Five  $2 \times 2$  analyses of variance, with sex and group as the independent variables, were computed for the chronological age (CA), IQ, weight, tricep skinfold, and percentage overweight variables. As expected, the obese group was heavier,  $F(1, 24) = 50.91, p < .001$ , had significantly larger skinfolds,  $F(1, 24) = 74.1, p < .001$ , and were more overweight,  $F(1, 24) = 65.0, p < .001$ , than the nonobese subjects. The mean IQ of the obese subjects was significantly lower than that of the nonobese group,  $F(1, 24) = 14.84, p < .001$ ; CA did not differ between groups.

Subjects were individually observed in their natural eating setting (the workshop cafeteria) during their regular 45-minute lunch period by two experimenters. Measures recorded for the first 15 minutes of the meal, divided into 5-minute segments, included: bites/drinks frequency, cumulative number of individual bites of food or drinks of liquid; active eating time, time spent actively eating (i.e., biting, chewing, drinking, or swallowing); and pause time, cumulative time during the first 15 minutes of the meal when subject was not actively eating. Additional measures recorded were total meal time, time elapsed from the first bite/drink to the last swallow, and calories consumed, estimate of calories consumed at the meal. Food selection available at the meals was determined by prearranged menus. Cafeteria attendants were responsi-

ble for serving standard sized portions of the prepared food. We collected copies of the daily menus, and for each subject, one observer would precisely record a description of the actual food and drink consumed, including a quantity estimate (e.g., 12 ounces of soda; 1 piece of white bread, 4 ounces of cottage cheese).

Using video-taped samples of individuals eating, we trained three observers on the eating behavior measures until they achieved at least 90 percent agreement with criteria that we established. Two observers were present for each workshop observation session; a third observer was occasionally present for reliability data recording. Observers positioned themselves at a table adjacent to the subject they were observing to allow a clear view of the subject's eating while not making their presence highly noticeable. Although clients in the cafeteria were aware of the observers' presence, observers consistently reported that their presence did not appear to influence the eating behavior of the subject being observed. During nonobservation time, observers frequently mingled with clients and staff to naturalize their presence in the cafeteria.

Reliability checks made during cafeteria observations resulted in the following interobserver mean percentage agreement data: bites/drinks frequency, 95.6 percent; eating/drinking time, 90.7 percent; and total meal time, 98.5 percent. The food description data obtained from the menus and observer recordings for each subject was converted into calories by one scorer using two references (Pennington & Church, 1980; Rezabek, Note 1). A second scorer ran-

TABLE 1  
CHARACTERISTICS OF THE SUBJECTS

Group <sup>a</sup>	CA		IQ		Weight <sup>b</sup>		Tricep skinfold <sup>c</sup>		% overweight	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Obese	28.8	8.9	38.6	11.2	87.7	17.9	38.4	8.7	64.9	30.2
Nonobese	30.3	15.2	50.6	9.7	54.7	5.8	15.1	4.5	-5.4	7.6

<sup>a</sup>  $N = 14$  for each group.

<sup>b</sup> In kg.

<sup>c</sup> In mm.

TABLE 2  
MEANS AND SDs FOR CONVERTED DEPENDENT MEASURES

Measure/Group	5-minute segment					
	First		Second		Third	
	Mean	SD	Mean	SD	Mean	SD
Bites/drinks <sup>a</sup>						
Obese	5.58	2.88	4.67	2.27	4.56	2.25
Nonobese	3.90	1.47	4.19	1.25	3.54	1.15
% active eating time						
Obese	77.2	20.4	77.6	17.4	60.9	32.2
Nonobese	73.7	18.5	74.3	21.9	78.8	18.0

<sup>a</sup> Frequency per minute.

domly selected three-fourths of the food records ( $N = 21$ ) and independently computed caloric values for the food description data using the same sources. The two scorers' data correlated highly on their caloric ratings,  $r(9) = .97, p < .01$ . All subjects were actively eating during the first 5-minute segment of the meal; 13 subjects in each group were eating for at least a portion of the second 5-minutes of the meal; 9 subjects in each group continued eating during the third 5-minute segment. As a result of the variable eating time, time-adjusted means were computed for the bites/drinks frequency and active eating time data. These converted data are shown in Table 2. The remaining dependent measures are shown in Table 3.

TABLE 3  
MEANS AND SDs FOR REMAINING DEPENDENT MEASURES

Group	% pause time <sup>a</sup>		Total calories consumed		Total mealtime <sup>b</sup>	
	Mean	SD	Mean	SD	Mean	SD
Obese	37.2	20.5	810.1	359.1	800.4	350.7
Nonobese	35.5	22.9	827.4	273.0	885.6	428.1

<sup>a</sup> First 15 minutes of meal.

<sup>b</sup> In seconds.

Since IQ differed significantly between the obese and nonobese groups (means = 36.6 and 50.6, respectively), an analysis of covariance was used for each variable in Tables 2 and 3 to control for this systematic bias. No significant differences were found between the obese and nonobese groups for total calories consumed, total meal time,

percentage active eating for all three 5-minute segments of the meal, and bites/drinks frequency per minute for the first two 5-minute segments of the meal, nor were there any significant sex interaction effects. The only significant main sex effect found was for the bites/drinks frequency per minute measure during the third 5-minute segment,  $F(1, 13) = 14.48, p < .002$ , where males eating rates (mean = 5.7,  $SD = 2.28$ ) were higher than females (mean = 3.4,  $SD = 1.15$ ). A significant interaction effect was also found,  $F(1, 13) = 7.58, p < .01$ ; the 2 obese males who were still eating during the third 5-minute segment of the meal ate faster than the 3 nonobese males (means = 8.05 vs. 4.1 bites/drinks per minute); however, given the very small male sample still eating during the third segment of the meal, the significance of this latter analysis for eating rate is questionable. Of more interest was the finding that although total meal time did not differ significantly between sexes, 92 percent of the males as compared with 44 percent of the females finished their entire meal in less than 15 minutes.

A major finding of the present study was the failure to discover significant eating behavior differences between the obese and nonobese retarded subjects observed in their natural eating environment. These results are similar to the consensus of findings in studies with nonretarded subjects (Stunkard & Kaplan, 1977). We did observe large interindividual differences in the eating behavior measures for both obese and nonobese persons. For example, calories consumed by the obese group ranged from 357 to 1,699 and from 380 to 1,232 for the



nonobese group; number of bites/drinks taken during the first 5 minutes of the meal ranged from 10 to 54 for obese subjects and 9 to 42 for nonobese subjects. Consequently, although a distinct eating style may not characterize the retarded and non-retarded obese populations in general, the wide variability observed in our sample suggests that eating patterns may be an important variable contributing to an obese condition for at least some individuals. For these individuals, behavioral treatment strategies designed to modify existing patterns would be justified. For obese persons in our sample who demonstrated "normal" eating behavior, other measures may be required to delineate the variables contributing to the maintenance of their obese condition (e.g., snacking patterns, daily or weekly caloric intake, physical activity levels).

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