

Marquette University  
e-Publications@Marquette

---

College of Education Faculty Research and  
Publications

Education, College of

---

4-1-1986

# The Effect of Two Weight Reduction Maintenance Strategies for Moderately/Mildly Retarded Adults

Anthony F. Rotatori  
*University of New Orleans*

Stephen Zinkgraf  
*University of New Orleans*

Johnny Matson  
*Northern Illinois University*

Robert Fox  
*Marquette University, robert.fox@marquette.edu*

David Sexton  
*University of New Orleans*

*See next page for additional authors*

---

Published version. *The Journal of Obesity and Weight Regulation*, Vol. 5, No. 1, (1986): 18-22. © 1986 Human Sciences Press. Used with permission.

---

**Authors**

Anthony F. Rotatori, Stephen Zinkgraf, Johnny Matson, Robert Fox, David Sexton, and Patricia Wade

# The Effect of Two Weight Reduction Maintenance Strategies for Moderately/Mildly Retarded Adults

ANTHONY F. ROTATORI, STEPHEN ZINKGRAF,  
JOHNNY MATSON, ROBERT FOX, DAVID SEXTON,  
and PATRICIA WADE

**ABSTRACT:** Thirteen retarded adult subjects were first exposed to a 12-week behavior therapy weight reduction program followed by a 10-month weekly weigh-in. Then the subjects were randomly assigned to an experimental maintenance booster session group (n=7) or a control post-treatment maintenance group (n=6) for 12 months. The results indicated that when weight control or maintenance procedures were in effect, the subjects lost weight. However, a 12-month follow-up check revealed that the long-term success of the treatment and maintenance procedures was not well maintained.

Approaches to sustaining weight loss after behavioral treatments have varied, but two common ones frequently appear in the literature (Brownell, 1982; LeBow, 1981). One approach is post-treatment meetings with the diet leader. Typically, the post-treatment meetings involve weight-checks and reinforcement for weight loss (Polly and Keenan, 1976; Rotatori, Switzky, and Fox, 1980). Another approach is after-care booster sessions (Ashby and Wilson, 1977; Domke, Lando, and Robinson, 1978; Hall, Hall, Borden, and Hanson, 1975; Kingsley and Wilson, 1977; Rotatori and Fox, 1980; Stuart and Guire, 1978). These booster sessions provided subjects with varying degrees of facilitative behavioral technology. The effectiveness of the above approaches has been mixed and inconclusive (LeBow, 1984). However, neither of these approaches have been attempted with the retarded. Thus, the purpose of this study was to compare the effectiveness of

---

A. Rotatori, S. Zinkgraf, and David Sexton are with the University of New Orleans. J. Matson is at Northern Illinois University. R. Fox is at Marquette University. P. Wade is at Fair Acres School. Requests for reprints can be sent to Anthony F. Rotatori, Department of Special Education, University of New Orleans, New Orleans, LA 70148.

two maintenance approaches, namely post-treatment meetings and after-care booster sessions, with overweight mentally retarded adults.

## METHOD

Thirteen overweight, mentally retarded adult subjects who were attending a vocational training center participated in the study. All clients were living with their families. The overweight clients were randomly assigned to an experimental maintenance booster session group or a control post-treatment group. The experimental group included seven subjects, five females and two males (mean age = 26.6 years,  $SD = 4.5$  years; mean percent overweight = 44.6,  $SD = 19.9$ ; mean IQ = 53.1,  $SD = 5.8$ ). The control group included six subjects, three females and three males (mean age = 35.7 years,  $SD = 8.8$ ; mean percent overweight = 54.6,  $SD = 8.4$ ; mean IQ = 43.2,  $SD = 2.9$ ). *T*-tests computed for age and percent overweight variables revealed no significant differences between the two groups.

## PROCEDURES

### *Phase I (12 Weeks)*

All subjects were exposed to a weight awareness curriculum for moderately and mildly handicapped individuals (Rotatori, Wade, Litton, and Fox, 1985). The curriculum which was directed by a school nurse involved group instruction in the following procedures: decreasing extra recreational/social eating (e.g., eating at coffee breaks or at a social dance hour at the center); self-monitoring techniques (e.g., recording daily weight and eating habit change); food-cue elimination techniques (e.g., taking only one helping and smaller portions at meals); increase energy expenditure (e.g., engage in daily calisthenics, home chores, and recreational sports); changing the act of eating (e.g., slow down eating, chew food completely before taking another bite); making low calorie food choices at meals (e.g., selecting a serving of fish rather than roasted lamb or having two percent milk rather than chocolate milk); using snacking to supplement one's diet (e.g., having a cheese sandwich to make up for not having any food from the milk group that day); maintaining a balanced diet (e.g., choosing foods from the four basic food groups); and determining the proper serving portions for each food group to maintain a healthy diet (e.g., meat, two three-ounce servings daily and fruit, four servings daily).

*Home reinforcers.* The clients received individual reinforcers for weight loss each week. The reinforcers were agreed upon by the clients and their family members prior to the start of Phase I. A specially designed certificate was used to communicate to the clients' families regarding the clients and eligibility for the agreed-upon reinforcer.

*Family contact.* The diet leader made a weekly contact with each client's family by note or telephone. Educational materials such as suggested low calorie packed lunches, fact sheets about so-called "diet foods," calorie values

of fast foods, calorie charts, and diet fallacies, were sent to the subjects' families. Every other week the leader dispatched letters of encouragement to the family with a request that they contact the leader with their questions or concerns. Also, weekly reminders were sent home on the night prior to each class, reminding the client and his or her family not to forget his or her workbook the next day.

*Social recognition.* The diet leader posted the total pounds lost for each client in a prominent place in the workshop, and encouraged all staff members to be vocal with positive reinforcement for dieters and to encourage peer reinforcement as well. Peer reinforcement, in fact, reached such a high level that being a participant in the program afforded a great deal of prestige.

*Recording by the family.* A weekly meal and exercise record were developed to assess the type and amount of food eaten as well as the time the client spent in exercise. A family member was responsible for the above recording each week. It was suggested that the recording be rotated among the adolescent and adult members of the family to increase their involvement in the program.

#### *Phase II (10 Months)*

All subjects were weighed once a week. The social recognition aspect mentioned above was continued throughout this phase. There was no contact with the subjects' families regarding the weigh-ins during this phase.

#### *Phase III (52 Weeks)*

During this phase, the experimental subjects received a repeat of all the components in Phase I (12 weeks) followed by a weekly weigh-in and social recognition for weight loss (40 weeks). In contrast, the control subjects were weighed weekly and received social recognition for weight loss throughout this phase.

#### *Phase IV*

Twelve months following the conclusion of Phase III, all subjects were weighed. No formal treatment was in effect during this time.

## DESIGN AND ANALYSIS

The design for this study was a  $2 \times 5$  (Group  $\times$  Phase) factorial with repeated measures over the last factor. The dependent measure, percent overweight (PO), was calculated by the following formula:

$$PO = \frac{\text{present weight} - \text{desirable weight}}{\text{desirable weight}} \times 100$$

PO was measured at five time points: a pre-test (PT) before the implementation of Phase I, and then after each of the four phases. This design

was analyzed via the appropriate  $2 \times 5$  repeated measures ANOVA. The omega-squared ( $w^2$ ) statistic was calculated for significant effects in the ANOVA. The omega-squared statistic is used to estimate the proportion of variance in the dependent variable, PO, accounted by the Phase effect. Omega-squared is an index of strength of association and has been used as a measure of practical significance of experimental results (Kirk, 1982).

Along with the  $2 \times 5$  repeated measures ANOVA, five a priori comparisons were specified. Dunnett's procedure (Kirk, 1982) was used to compare the mean PO of each of the four phases to the mean PO of PT, the control condition. The fifth comparison compared the mean difference in PO from the end of PII to the end of PIII of the two groups. The latter comparison was selected to test the experimental effect of retreating Group 1 during Phase III.

And, lastly, the effect of the weight control procedures were investigated with respect to individual subjects. Because the mean PO can be affected by extreme gains or losses, verifying which treatment is relatively consistent across subjects is important.

## RESULTS

### *Analysis of Variance*

The  $2 \times 5$  repeated measures ANOVA showed a significant Phase effect,  $F(4,44) = 8.50$ ,  $p < .05$ ,  $MSe = 73.64$ . The Group by Phase interaction effects were not significant. The mean PO's for each are found in Table 1. The omega-squared statistic for the significant Phase was calculated to be .11. Because this calculation was based on a repeated measures ANOVA, rules discussed by Halderson and Glasnapp (1972) were used. This result indicated that approximately 11% of the variance in percent overweight is accounted for by the

Table 1  
Mean Percent Overweight for the Five Time Points

	PRE-TEST	PHASE I	PHASE II	PHASE III	PHASE IV
Mean	49.3%	39.9%	32.3%	32.9%	41.2%
SD	16.0%	15.8%	18.0%	18.7%	18.8%

Note 1.  $F(4,44) = 8.50$ ,  $p < .05$   $MSe = .00736$

Note 2.  $\bar{n} = 13$  at each phase

Phase effect. The Phase effect was considered to be both statistically and practically significant.

#### *A Priori Comparisons*

When using Dunnett's procedure to compare the mean PO of the pretest to those of PI-PIV, the results indicated that the mean PO's were significantly lower for PI, PII, PIII when compared to PT. The mean PO for PIV was found not to be significantly different from PT. The mean decreases in PO from PT to PI, PII, PIII, and PIV respectively were 9.4%, 16.9%, 16.4% and 8%.

The last a priori comparison compared the average change in PO from PII to PIII between groups. This comparison yielded a significant difference in mean PO change from PII to PIII with Group I (the experimental group) logging an average of 1.7% and Group II gaining 3.1% ( $t = 2.61$ ,  $df = 11$ ,  $p < .05$ ). Table 2 shows the group PO's after PII and PIII.

#### *Individual Differences*

Because the mean PO at any time point could have been affected by extreme scores and because of the relatively small group sample sizes, individual changes at adjacent measurement points were investigated. This was done to determine the consistency of changes in PO for each subject. The first indices of consistency of change were the correlations of PO scores at adjacent time points (i.e., PT vs. PI, PI vs. PII, PII vs. PIII, and PIII vs. PIV). This analysis was done regarding group membership of the study since the  $2 \times 5$  ANOVA showed no group effect. The average of the four correlations, using Fisher's  $z$ -transformation, was .92 and correlations ranged from .81 to .98. This result indicated that even while the mean PO's changed from phase to phase, each subject's ranking within the group remained relatively constant. In other words, the subjects' individual changes in PO were very similar to mean changes in PO. To take the analysis a step further, we looked at the proportion of subjects that changed PO from PT to PI and from PIII to PIV. A consistent drop in PO from PT to PI was found with all subjects. These drops ranged from 3% to 19% with a mean of 9.4%. An increase in PO from the end of PIII, the last treatment phase, was expected. Again, there was a consistent effect across subjects with every subject increasing from 2% to 36% with a mean increase of 8.3%.

Similar analyses were done with respect to the a priori comparison

of group changes from PII to PIII. When looking at individual subjects within each group, 6 of 7 subjects in Group I decreased in PO and 5 out of 6 subjects in Group II stayed the same or increased in PO. Once again, the effect of treatment is relatively consistent across subjects.

## DISCUSSION

The program was successful in promoting weight loss during active treatment periods. Subjects in both groups lost significantly and clinically meaningful amounts of weight. In fact, the mean weight percent decreases attained by the subjects is among the highest ever recorded in the literature with mentally retarded subjects (Jackson and Thorbecke, 1982; Rotatori, Switzky, and Fox, 1983). This finding supports Rotatori's (1978) contention that extended treatment programs are needed to allow mentally retarded subjects to lose clinically meaningful amounts of weight.

An interesting facet of this study was the effect on the weigh-in plus reinforcement treatment condition in Phase II and III. During Phase II this treatment strategy resulted in continued weight loss by all subjects. In contrast, the strategy in Phase III maintained the weight loss for the control group subjects. More importantly, when the experimental subjects were given an after-care booster session followed by weekly weigh-ins plus reinforcements, the subjects in this group continued to lose weight. The latter effect lends support to the position findings reported in studies (Domke, Lando, and Robinson, 1978; Kingsley and Wilson, 1977) that used after-care sessions with normal subjects.

Table 2  
Mean Percents Overweight for Phase II and Phase III

Group	Phase II		Phase III	
	Mean	SD	Mean	SD
Group I	28.6%	18.3%	26.9%	18.6%
Group II	36.8%	18.4%	40.0%	17.8%



The follow-up weight measure at the end of Phase IV shows that the long-term success of this treatment was not maintained. This finding has been reported consistently in a number of review studies (Brightwell and Sloan, 1977; Stunkard & Penick, 1979) concerned with long-term efficacy of behavior weight reduction treatment programs. This continuing problem has resulted in LeBow (1981) recommending that the reapplication or reinstatement of treatment procedures occur after subjects begin to gain small amounts of weight rather than as a routine after-care booster session. The present findings would warrant an investigation into the above suggestions as well as other procedures to measure the long-term efficacy of behavior therapy for weight reduction.

## REFERENCES

- Ashby, W. A., & Wilson, G. T. (1977). Behavior therapy for obesity: Booster sessions and long-term maintenance of weight loss. *Behavior Research and Therapy*, 15, 451-464.
- Brightwell, D., & Sloan, C. (1977). Long-term results of behavior therapy for obesity. *Behavior Therapy*, 8, 898-905.
- Brownell, K. D. (1982). Obesity: Understanding and treating a serious prevalent refractory disorder. *Journal of Consulting and Clinical Psychology*, 50, 820-840.
- Domke, J. A., Lando, H. A., & Robinson, D. C. (1978). *Efficacy of follow-up booster sessions in treating obesity*. Paper presented at the meeting of the American Psychological Association, Toronto, Canada.
- Halderson, J. S., & Glasnapp, D. P. (1972). Generalized rules for calculating the magnitude of an effect in factorial and repeated measures ANOVA designs. *American Educational Research Journal*, 9, 301-310.
- Hall, S. M., Hall, R. G., Borden, B. L., & Hansen, R. W. (1975). Follow-up strategies in the behavioral treatment of overweight. *Behavior Research and Therapy*, 13, 167-172.
- Jackson, H. J., & Thorbecke, P. H. (1982). Treating obesity in mentally retarded adolescents and adults: An exploratory program. *American Journal of Mental Deficiency*, 87, 302-308.
- Kingsley, R. G., & Wilson, G. T. (1977). Behavior therapy for obesity: A comparative investigation of long-term efficacy. *Journal of Consulting and Clinical Psychology*, 45, 288-298.
- Kirk, R. E. (1982). *Procedures for the behavioral sciences* (2nd ed.). Belmont, CA: Brooks/Coles.
- LeBow, M. D. (1981). *Weight control: The behavioral strategies*. New York: John Wiley & Sons.
- LeBow, M. D. (1984). *Treating childhood obesity*. New York: Springer Publishing Company.
- Polly, S. J., & Keenan, C. A. (1976). *Self-management training with various booster treatments: Effects on the modification and maintenance of weight*. Paper presented at the meeting of the Association for the Advancement of Behavior Therapy, New York.
- Rotatori, A. F. (1978). The effect of different reinforcement schedules on the maintenance of weight loss with retarded overweight adults previously exposed to a behavioral weight reduction treatment package. *Dissertation International*, 38, 4738-N.

- Rotatori, A. F., & Fox, R. (1980). A comparison of two weight reduction programs for moderately retarded adolescents. *Behavior Therapy, 11*, 410-416.
- Rotatori, A. F., Fox, R., & Switzky, H. A. (1980). Multicomponent behavioral program for achieving weight loss in the adult retarded. *Mental Retardation, 18*, 31-33.
- Rotatori, A. F., Wade, P., Litton, F., & Fox, R. (1985). *Teaching nutrition, exercise and weight control to the moderately/mildly handicapped*. Springfield, IL: Charles C. Thomas.
- Stuart, R. B., & Guire, K. (1978). Some correlates of the maintenance of weight loss through behavior modification. *International Journal of Obesity, 2*, 225-235.
- Stunkard, A. J., & Penick, S. B. (1979). Behavior modification in the treatment of obesity: The problem of maintaining weight loss. *Archives of General Psychiatry, 36*, 801-806.