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The predictive value of MMPI personality style in obesity therapy

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THE PREDICTIVE VALUE OF MMPI PERSONALITY STYLE IN OBESITY THERAPY

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Abstract

The present study assessed whether psychopathology influences obese subject's ability to lose weight. The Minnesota Multiphasic Personality Inventory (MMPI) was used to differentiate between 46 pathological and 52 nonpathological subjects. A repeated measures analysis of variance did not support the hypothesis that the degree of weight loss is negatively associated with the amount of psychopathology measured by the MMPI. In addition, an analysis of covariance was conducted in an attempt to control for possible confounding factors at the start of treatment and also failed to support the hypothesis.

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Introduction

The purpose of this study is to determine whether psychopathology affects the amount of weight loss for obese individuals participating in an organized weight loss program. In a recent literature review, Wadden and Stunkard (1987) suggest that individual psychopathology is no greater in an obese population than a normal one. However, Ellsworth, Strain and Valliant (1986), Sanso (1984), Rabkin (1983), and Jonsson, Bjornwell, Lavander and Rosaner (1986), propose that psychopathology is a major predictive factor in obesity treatment outcome. In addition, clinical observation by obesity program staff (T. Korn, Personal communication, December 18, 1988) suggests that several distinct personality styles occur among obese women which influence patient weight loss.

Two studies dealing with obesity have been conducted which suggest that personality styles may have predictive validity for treatment outcome. In one study (Scott & Baroffio (1986) assessed Minnesota Multiphasic Personality Inventory (MMPI) profiles of 30 hospitalized female anorexic patients, 30 hospitalized bulimic patients, 30 female morbidly obese patients (22-59 years of age), and 30 females in a control group and compared similarities and differences. The results indicated no significant difference in the overall profiles of the three experimental groups, but all differed from the control group. Specifically, obese participant's MMPI scores represented more pathology than profiles of the normal-weighted control group. Another study assessed the relationship between personality factors and the loss of weight in 207 overweight subjects (Sanso, 1984). The MMPI was one of the tests used to measure personality factors. All subjects were given a diet

of 700-1200 calories a day for eight weeks. The results suggested that personality variables have predictive value for treatment of obesity.

A contrasting point of view to the above is offered by Wadden and Stunkard (1987) who state that "The long-standing belief that obese persons suffer disproportionately from severe emotional disturbances appears to be incorrect" (p. 55). Studies by Hallstrom and Noppa (1981) and Larson (1978) "have supported the conclusion that emotional disturbance is no more common among the obese than among normal-weighted persons." (Wadden and Stunkard, 1987, p. 55). The orientation of these researchers would suggest that use of psychopathology or type of psychopathology would be an ineffective way of predicting weight loss in an obesity program.

Clinical experience by treatment program staff in a large midwestern psychiatric hospital (T. Korn, Personal communication, December 18, 1988) suggests that patient psychopathology is a major issue related to the success or failure of participants undergoing obesity treatment. Specifically, hysterics, psychopathic deviants and depressives are the personality styles Korn (Personal communication, December 18, 1988) believes influence weight loss. When related to the MMPI, it was predicted that scales 2,3 and 4 would be the most frequent pathologies encountered in the present study.

Subjects with elevated 3 and 4 MMPI scales score strongly in the hysteria and psychopathic deviant areas. These subjects typically are naive and insightless people (Carson, 1969). They tend to be very impulsive and strive for immediate gratification of their impulses. They often disregard the consequences of their actions and tend not to benefit from past experiences and consequently, many times find themselves

confronted with the same difficulties repeatedly (Carson, 1969). Mello and Guthrie (1958) state that these individuals present problems rooted in an unhappy home situation, have difficulty with authority figures and worry about lack of acceptance by their social group. A large sex difference exists in respect to frequency of scale 3 peaks. For women, scale elevations are common, but for men such peaks are unusual (Dahlstrom, Welsh & Dahlstrom, 1972). Women with an elevated scale 3 (T score of 70 or above) tend to have an underlying sensuality and sexuality (Duckworth & Duckworth, 1975). Duckworth & Duckworth (1975) stated "Scale 3 is more typically elevated on women's profiles than it is on men's." (p. 72).

Subjects with an elevated MMPI scale 2 often display depressive symptoms characterized by self-depreciation and guilt feelings. Duckworth & Duckworth (1975) proposes that individuals with a scale 2 elevated above 70 are usually experiencing "a long term unhappy situation with which the person has learned to live". Gravitz (1968) reports that women who have an elevated 2 scale tend to report depression significantly more often (2 to 1) than men who have an elevated scale 2.

Duckworth and Duckworth (1975) defined the following MMPI scales when elevated to a T score of 70 or above. Scale 1 measures hypochondriasis and these individuals tend to use bodily complaints to avoid emotional issues and also tend to use these complaints as a way of manipulating others. Paranoid personality styles are represented by scale 6 and these people tend to be suspicious and may assume other people are "after them". Righteous indignation is also usually present. Psychasthenia is assessed by scale 7 and measures anxiety. These individuals tend to be worried, tense and indecisive. Scale 8 measures

mental confusion. Difficulties in logical thinking may develop and these individuals may feel alienated from their social environment. Psychic energy is measured by scale 9 and is labeled hypomania. People scoring high on this scale seem to have an excess of energy and frequently take on more projects than they can complete. Much fantasy is usually present. Scale 0 measures introversion and was not used in the present study as it represents only mild pathological characteristics. Scale 5 attempts to determine whether one is more or less masculine or feminine. A T score above 70 on the aforementioned scale represents an individual who is uninterested in aesthetics and being female. Due to the fact that scale 5 is not an appropriate measure of pathology, it was not considered in the present thesis. Due to their dysfunctional nature, individuals with a high degree of psychopathology participating in a weight loss program would be expected to benefit less than individuals with better mental health. Regardless of whether emotional disturbances are just as common among the obese as in normal-weighted individuals, the present study proposes that psychopathology has predictive value concerning the degree of weight loss in obesity therapy.

The Optifast program is a nationally standardized approach for the treatment of obesity. Optifast consists of four distinct stages and for the purposes of the present study are considered the treatment. The first phase (1) of the treatment program involves a 12-week fast during which the participants are exposed to intensive cognitive-behavioral, self-management training and an emphasis on graded exercise. The goals of Phase 1 are to facilitate maximal participant weight loss in as brief as possible time period that is medically safe, and at the same time to develop participant behavioral self-management skills appropriate to

their "weight" problems. Supplementary nutritional education is conducted concurrently. All educational and training experiences are conducted in the context of behaviorally based support groups. The only nourishment participants receive during Phase 1 of the treatment program is a nutritionally balanced liquid dietary supplement of 420 or 800 calories per day. Participant daily caloric intake is determined by the exertional requirements of their occupation and their health status.

The second phase (2) of the treatment program involves graded re-feeding by the participant, in the context of continued self-management training, group support, and nutritional education. This phase lasts six weeks. The goal of the second phase is to reintroduce participants to a progressively more complex diet containing nutritionally balanced solid food. The upper end of the participant caloric intake during Phase 2 does not exceed 1200 calories daily; all prior group treatments are conducted concurrently throughout this phase.

The purpose of the final phases (3 and 4) of the Optifast treatment program are weight stabilization and maintenance of their attained body weight. The third phase of the program involves a six-week dietary and behavioral stabilization period during which the maximum daily caloric consumption by the participant stabilizes and group therapy is concurrent. The fourth and final phase of the treatment program involves a long-term weight maintenance support group; this phase may last indefinitely and involves supplementary behavioral management and nutritional education training when needed. Due to the time constraints of the present study, the fourth phase will last 30 days.

All treatment program groups were conducted by behavioral specialists (psychologist or staff who had completed all the academic

requirements necessary for a doctoral degree in psychology except the dissertation), and all training materials, objectives, and guidelines were standardized with a cognitive behavioral emphasis. Nutritional education sessions were conducted within the behavioral treatment groups by dieticians working with the behavioral specialists.

Studies which support the credibility of the Optifast program include Wadden, Stunkard, Brownell and Day (1984) where seventeen obese women, averaging 87% overweight, were treated for six months with a program of very low calorie diet (400-500 cal.) and behavior modification designed specifically for weight loss maintenance. The subjects showed significant reductions in anxiety and depression, even while consuming a very low calorie diet. Subjects lost an average of 45 pounds and regained an average of only 4.6 pounds during a one-year follow-up. Other studies validating the effectiveness of the Optifast program are those by Lockwood and Amatruda (1984), Vertes (1984), Tuck, Sowers, Dornfield, Kledzik and Maxwell (1981), and Vertes and Hazelton (1979).

The principal research question the present study addressed is whether the degree of pathology among women measured by the MMPI is related to the degree of weight loss using the Optifast program. To address this question the following hypothesis will be tested: Is the degree of weight loss among women in the Optifast program negatively associated with the degree of pathology measured by the MMPI?

Method

Design

The study was conducted utilizing a retrospective, quasi-experimental design as body weight data had already been collected by Optifast program staff. Data for the study was obtained from the

participants in an Optifast program (currently residing in the Omaha area) who had consented and taken the MMPI as part of their preliminary assessment for participation in treatment.

Fig. 1 is presented in appendix A

Subjects

A sample of 171 female participants were taken from the Omaha Optifast clinic records. The subject's MMPI scores were recorded and served to indicate pathology or nonpathology. The pathological and nonpathological groups were composed of 57 subjects each. Only the 147 subjects who completed the treatment were used for analysis. Of the total number of subjects, 46 of the pathological subjects and 52 of the nonpathological participants completed the Optifast program. For actual inclusion in the study, all those participants that met the definition of the pathological group were included, whereas every other subject from the file pool was included in the nonpathological group. Subjects included in the pathological group scored at least two standard deviations above the mean on two or more of the eight MMPI scales which measure pathology. All subjects included in the nonpathological group obtained no MMPI scale elevation over a T score of 70. In reference to MMPI scale elevations reaching a T score of 70, Wadden and Stunkard (1985) stated, "scores of this magnitude, which are two standard deviations above the mean, are indicative of clinically significant psychopathology" (p. 1064). Figure 1 represents the frequency of the most elevated scale for each subject in the pathological group.

Dependent Variable

The dependent variable in the present study was the subject's body weight and was recorded during initiation of the program and at the end of each phase of the Optifast treatment. Participant's body weight assessments were obtained from each patient's case record.

Data Analysis

Analysis of MMPI personality styles in predicting weight loss was accomplished by using a mixed analysis of variance design (ANOVA). The design was a 2 (pathology) x 5 (phase) factoral design. A general linear models (GLM) framework was incorporated in the study because it efficiently analyzes unequal sample sizes (SAS User's Guide, 1985).

An analysis of covariance (ANCOVA) was also used to test the principal hypothesis and thereby attempt to control for possible confounding factors at the start of treatment.

Results

The hypothesis tested whether those women who manifested the most psychopathology would not be as successful in losing weight as other females who appeared to have better mental health. As previously mentioned, a mixed design ANOVA was used to test this hypothesis.

The attrition rate was 19.3% for the pathological group and 8.8% for the nonpathological group. A chi-square was undertaken to assess the possibility of significant attrition rates between the groups and was nonsignificant ($X^2 = 5.99$, $df = 3$, $p = .11$). Therefore, the results of the present experiment do not appear to be confounded by significantly more subjects in the pathological group quitting the program when compared to individuals in the nonpathological group.

Fig. 2 is presented in appendix A

Figure 2 presents the mean body weight of each group at each phase. Inspection of figure 2 reveals initial differences between groups and remarkably parallel rates of weight loss for each group across the 5 phases. Specifically the mean total weight loss at the end of treatment for the pathological group was 59.00 pounds and 55.04 pounds for the nonpathological group.

Table 1 is presented in appendix A

Table 2 shows the overall F values for the 2 x 5 mixed design ANOVA performed on the data. The pathological group differed in body weight throughout the entire treatment when compared to the nonpathological group ($F = 9.07$, $df = 1/98$, $p < .01$). The Optifast program produced a significant weight loss for both groups across the five phases of treatment as each lost similar amounts of weight during the program. ($F = 938.51$, $df = 4/98$, $p < .01$). The analysis did not indicate a group by phase interaction ($F = 1.57$, $df = 4/98$, $p = .18$). The lack of interaction indicates the degree of weight loss is not negatively associated with the degree of pathology measured by the MMPI. The primary hypothesis of the current thesis could not, therefore, be supported.

While the primary hypothesis was not supported by the ANOVA, inspection of Figure 2 revealed a rather large difference of 24.6 pounds between the initial weight levels of the pathological and nonpathological groups. Since the weight differences between groups may have confounded

any differential weight loss between them by a scale restriction, an ANCOVA was performed with the initial phase weights serving as the covariate. The ANCOVA indicated no significant main effect for group ($F = .04$, $df = 1/98$, $p = .84$) or phase ($F = 1.17$, $df = 3/98$, $p = .32$). When the initial phase weight difference is partialed out of the analysis, the pathological group's body weight is not significantly different from the nonpathological group. The absence of a significant group by phase interaction ($F = 1.56$, $df = 3/98$, $p = .20$) suggests that the extent of pathology is not an important consideration in determining weight loss in the Optifast program.

Discussion

The results of the ANOVA seem to support the effectiveness of the Optifast program in that a main effect for phase was found to be significant at the $p < .01$ level. These findings are in agreement with previous studies by Wadden, Stunkard, Brownell and Day (1984), Vertes (1984), Tuck, Sowers, Dornfield, Kledzik and Maxwell (1981), and Vertes and Hazelton (1979) where the effectiveness of the Optifast program was validated. The Wadden, Stunkard, Brownell and Day (1984) study reported during a six month treatment period their subjects lost an average of 45 pounds which compares favorably with the 57-pound mean weight loss found in the current study. Of the 147 subjects who completed the treatment, the Optifast program appears to be an effective means of weight loss.

The treatment seemed to be equally effective for both groups in the current study, regardless of the degree of pathology. One possible explanation for this uniform range of effectiveness may be the multifaceted approach the program uses and is consistent with the results of Mordes and Rossini (Kozak, 1982) who summarized their approach to

obesity treatment as incorporating behavior modification, a hypocaloric diet, and graded exercise. These features are all included in the Optifast program. The majority of the subjects participating in the treatment seemed to identify and incorporate at least part of the program. Subjects with varying degrees of pathology may benefit from different parts of the program, but with the final outcome being nearly the same for each group in the present study.

The lack of relationship between personality variables and participant weight loss found in the present thesis contrasts with Sanso's (1984) finding that pathology has predictive value for obesity treatment success. The aforementioned discrepancy may be related to differences in sample size. Although the sample size of 98 subjects in the present study seems adequate to assess the hypothesis, Sanso (1984) used 207 subjects which may have made his study more sensitive.

The sensitivity of the present thesis as a test of the principal hypothesis could be improved in the future if additional data were collected on each subject. For example, weight as well as frame size could be used to calculate an ideal body weight for each participant. Therefore a percentage overweight figure could be calculated for each patient and such a measure might have unconfounded the initial weight differences observed between the two groups used in the present study. Perhaps such a statistic would unconfound the initial weight difference between the pathological and nonpathological groups.

Attrition rates were not found to be significantly disproportionate between groups. Degree of pathology did not seem to influence subject's ability to complete the treatment. However, still more subjects in the pathological group dropped out of the treatment than from the

nonpathological group, as was hypothesized, but not to such a degree as to confound the test of the principal hypothesis.

The pathological group weighed significantly more than the nonpathological group at the initial phase of the program ($F = 9.21$, $df = 1/98$, $p < .01$). The aforementioned findings seemed to offer indirect support for the principal hypothesis in that people with more pathology appear to be more obese than nonpathological individuals. Whether pathology causes obesity or obesity causes pathology is a question involving cause and effect which the present thesis did not assess. Future research should investigate why the pathological group was heavier than the nonpathological group at the start of the experiment. However, pathology does not appear to significantly influence weight loss.

A one year follow-up would be the next logical step in investigating any relationship between psychopathology and weight loss success. While the present study found no evidence of pathology influencing weight loss during treatment, it may be a significant factor in individuals maintaining their weight loss after exposure to the program. Additional research should focus on answering the preceding questions.

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Appendix A: Figures and Table

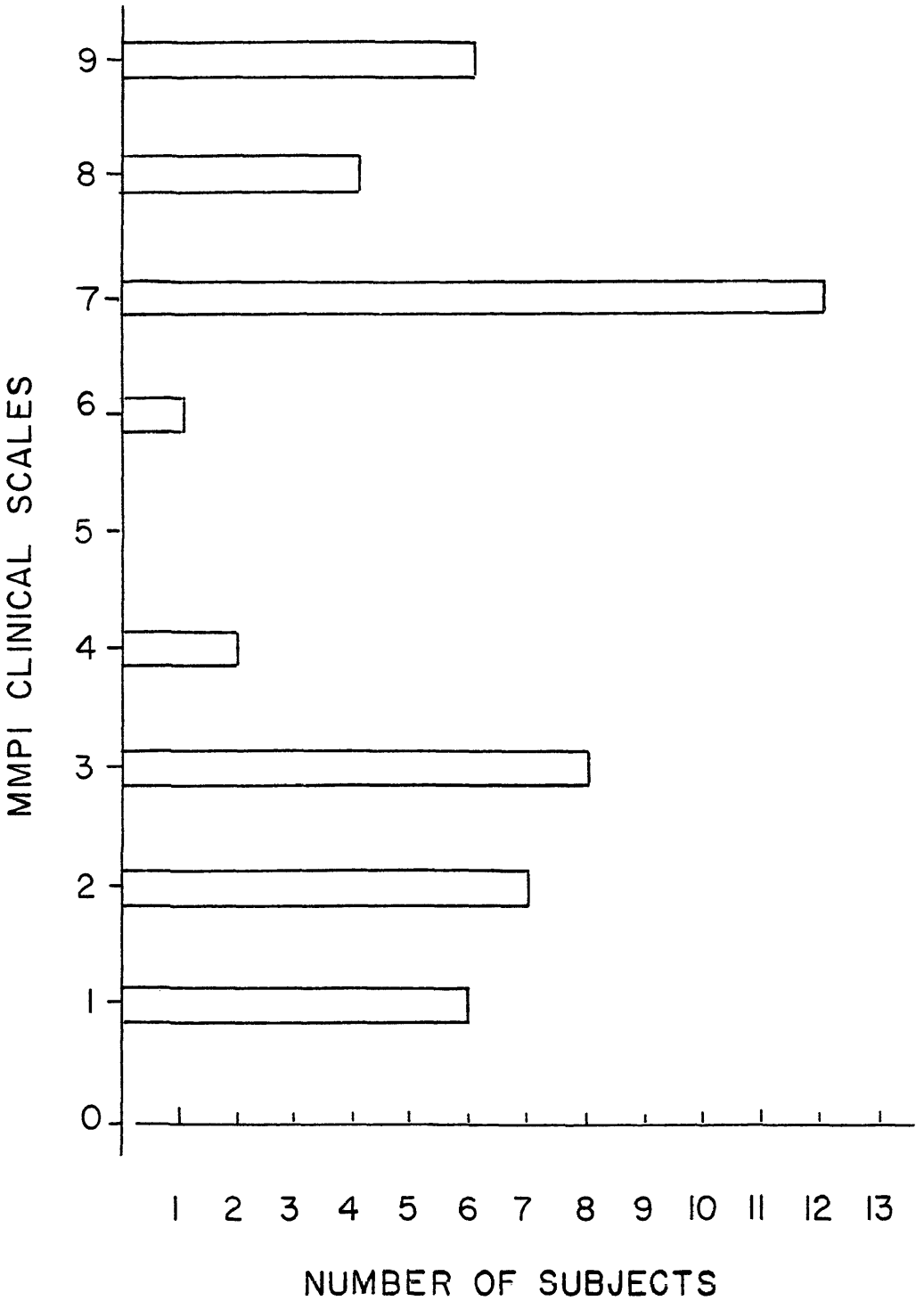

Fig. 1 The frequency of elevated MMPI scales.

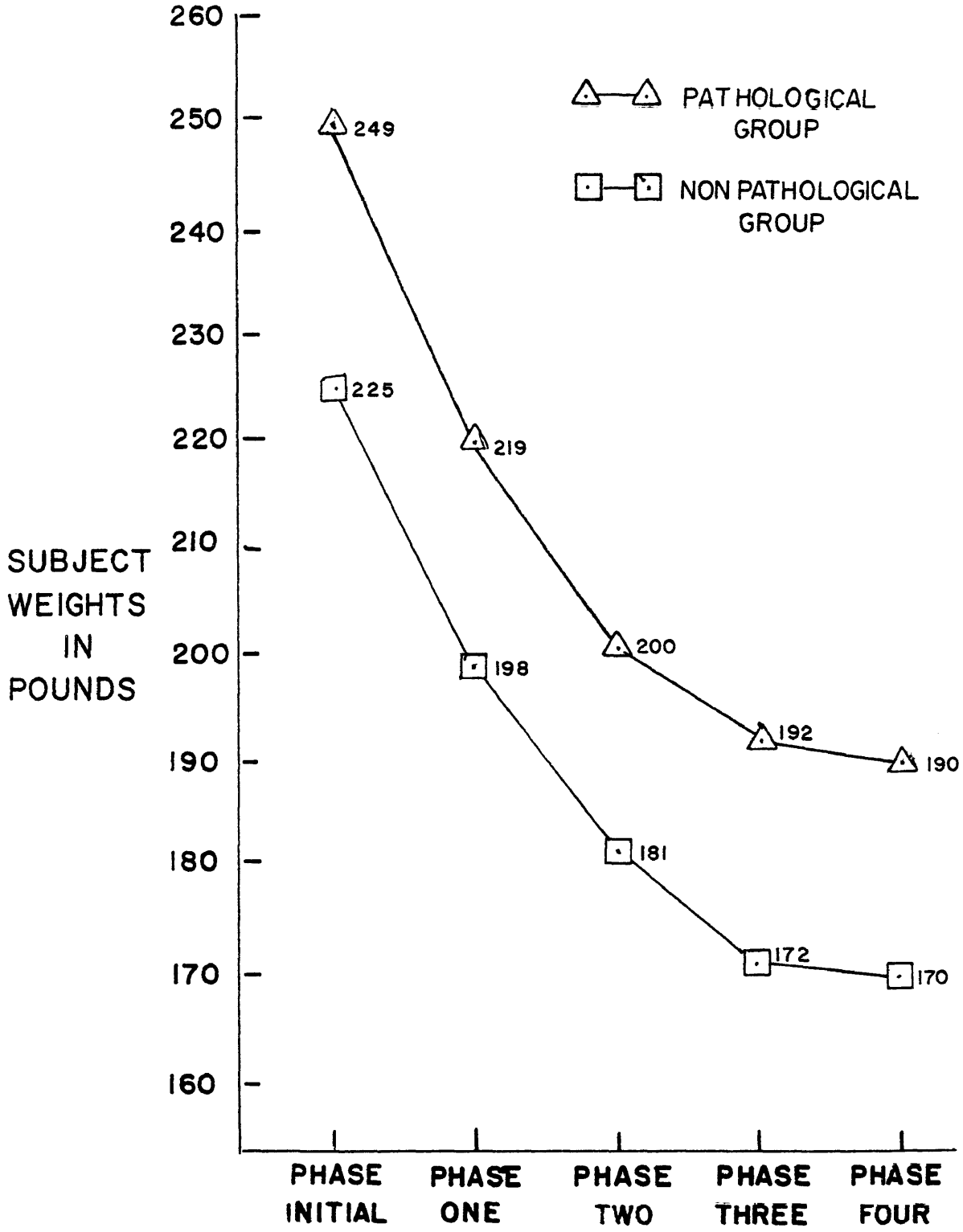

Fig. 2 The mean body weight of each group at each phase.

Table 1

Analyses of Variance

	df	SS	MS	F
GROUP	1	55007.19	55007.19	9.07
PHASE	4	221538.11	55384.52	938.51
GROUP BY PHASE	4	370.70	92.68	1.57
ERROR BETWEEN	96	582360.91	6066.26	
ERROR WITHIN	384	22661.03	59.01	