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The effect of gender on responsiveness to internal and external cues associated with eating behavior.

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THE EFFECT OF GENDER ON RESPONSIVENESS TO INTERNAL AND EXTERNAL CUES ASSOCIATED WITH EATING BEHAVIOR

A Dissertation Presented

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INTRODUCTION

According to Schachter (1968; 1971a; 1971b) there are significant differences between obese and normal weight individuals in the variables which control their eating behavior. These differences have important implications for the treatment of hyperphagia. They also help explain why most treatment procedures in which diet alone is emphasized are effective in the short run yet tend to fail over extended periods of time. Schachter dichotomizes these differences into responsiveness to internal, physiological cues by the nonobese versus reactivity by the obese to external, environmental stimuli. However, a careful review of the obesity literature reveals empirical findings and methodological shortcomings which suggest that a revision of Schachter's hypothesis may be in order. This revision would take into account gender and socio-economic status.

Schachter (1971c) contends that neither a purely peripheral formulation (James, 1890) nor a completely central view (Cannon, 1927, 1929; Cannon, et al, 1927) is adequate to cope with the available facts relating to emotion. Both theories, according to him, make the error of assuming that there is a one-to-one relationship between a set or pattern of physiological processes and a specific behavior or psychological state. Rather than this one-to-one relationship, Schachter assumes that both cognitive and situational factors determine what label (i.e., joy, anger, fear, hunger, etc.) is applied by the individual to his state of physiological arousal. The labelling of a particular internal or visceral syndrome "is a learned, cognitively,

and socially determined act" (Schachter, 1971c, p. 72). Thus, for Schachter, any new theory of emotion

> "will have to deal with concepts about perception, about cognition, about learning, and about the social situation. We will be forced to examine a subject's perception of his bodily state and his interpretation of it in terms of his immediate situation and his past experience" (p. 54).

In this context, and on the basis of experimental data reviewed below, Schachter states that the obese do not label any bodily states as hunger and thus their eating is unrelated to any physiological condition. But since the obese do eat, the precipitating or controlling factor or factors must be sought elsewhere. He hypothesizes that (1) the nonobese individual labels his visceral state accurately and thus his eating behavior is contingent upon his internal state, upon the visceral cues associated with hunger, and is relatively uninfluenced by the external stimuli associated with eating, and that (2) the eating behavior of the obese person, who does not label accurately, is primarily under the control of external, food-related cues such as sight, smell, taste, and time while being relatively insensitive to the physiological correlates of food deprivation. Furthermore, Schachter maintains that this internal-external dichotomy is not only true of eating behavior, but that "evidence is rapidly accumulating that eating is a special case of the more general state ... that at low levels of stimulus prominence, the obese are less reactive, and at high levels of prominence more reactive, than normals" (Schachter, 1971a, p. 143).

If this means that the obese are more likely, as a function of alteration of environmental stimuli, to change their labelling of

an internal state, and if, as the obesity literature indicates, anxiety and depression are emotional states closely related to obesity, then a prediction can be made about the difference between the obese and the nonobese in the reporting of anxiety and depression. The magnitude of the difference in degree of anxiety and/or depression reported across level of cue prominence should be greater for the overweight than for the normal weight. It is difficult to predict the direction of the change since the literature regarding anxiety and depression among the obese is so confused. However, this may reflect a failure of the various investigators to distinguish between psychiatric and nonpsychiatric populations, between differences in male and female responding, and/or differences in socioeconomic status. For example, there have been reports of more depression among the nonobese than among the obese (Hamburger, 1951; Simon, 1963), of no difference in anxiety between the underweight, normal weight, and overweight (Friedman, 1959), of no difference in level of both anxiety and depression between obese subjects and matched normals (Shipman and Plesset, 1963). Still other studies, using obese subjects in various dieting treatment programs, report diversely a decrease in both anxiety and depression with dieting (Biggers, 1966; Fischer, 1967); no decrease in depression (Silverstone and Lascelles, 1966) or in either anxiety or depression with dieting (Kollar and Atkinson, 1966); an increase in both anxiety and depression with dieting (Swanson and Dinello, 1970); and an increase in depression with dieting (Stunkard, 1956, 1957; Kurland, 1967).

There are several studies which provide empirical support for the contention that there is a qualitative dissimilarity between the

stimulus-boundedness of the obese and that of the nonobese. The same studies also provide the basis for raising some questions regarding that hypothesis. The early investigations by Stunkard and his associates (Stunkard, 1959a; Stunkard and Koch, 1964) demonstrate that gastric motility is strongly correlated with reports of hunger by the nonobese while the reverse holds true for the obese. Furthermore, the data from these studies suggest that gender is an influencing variable in hunger-related behavior. Nonobese females frequently report hunger in the presence of gastric motility and no hunger in its absence while nonobese males show a more random association of these variables. Obese women, on the other hand, report hunger infrequently even in the presence of gastric motility (Stunkard refers to this phenomenon as a "denial of hunger") while many obese men report hunger very often even in the absence of stomach contractions (Stunkard refers to this as the "exaggeration of hunger"). Schachter cites the early Stunkard studies and refers to the ability of the normal subjects to respond accurately to the internal cue of gastric motility, but he fails to take into account the differences between males and females, both obese and nonobese, in these responses. In a later study (Stunkard and Fox, 1971) in which a different methodology (open-tipped catheters instead of balloons to measure motility and rating scales instead of yes-no responses to measure hunger) is used, Stunkard reports that the influence of gastric motility is weaker and more inconsistent than had been previously reported. He concludes that "defects in perception of gastric motility do not seem to account for the disturbances in hunger or the control of food intake of ... obese ... persons" (p. 123). It should be noted, however, that this study

fails to control for the possible effect of gender in that the experimental sample consists almost entirely of women.

The results of the studies by Schachter and his associates provide strong evidence that there is a relationship between body weight and the relative potency of external and internal stimulants to eating. However, the laboratory experiments (Schachter, Goldman, and Gordon, 1968; Schachter and Gross, 1968) make use only of young adult males, while the field studies (Goldman, Jaffa, and Schachter, 1968), which do utilize both male and female subjects, do not investigate the possible effect of gender on food-related behavior. In the Schachter, Goldman, and Gordon study fear and food-deprivation are manipulated. The results indicate that normals eat more when calm than when sated and that the obese eat roughly the same in all conditions. This suggests that the former are responding to an internal state while the latter are not. In another experiment, Schachter and Gross manipulate imagined time with the results that the obese subjects eat more when they think they are eating <u>after</u> their regular dinner than when they think they are eating <u>before</u> their dinner hour. There is no such effect for the nonobese. Here the former are responding to an external cue of clock time while the latter appear to be responding to the internal cues of hunger. From a series of field studies, Goldman, Jaffa, and Schachter find: (1) of those overweight Jews who fast on Yom Kippur, those who spend more time in the synagogue, where no food-relevant cues are present, find fasting less of an ordeal; (2) overweight college students are more intolerant of unappetizing dormitory food than are normal weight students; and (3) the overweight members of international airflight crews adjust more easily

to time zone changes than do normal weight members. Schachter and his fellow investigators interpret these results as confirmation of their hypothesis that there is a relationship between body weight and relative potency of external and internal stimulants to eating.

Further support is provided by the outcomes of several studies designed by Nisbett and his associates. Again it should be noted that the subjects in these studies are primarily young adult males and, where females are included in the sample, no effort is made to control for the effect of gender. Nisbett (1968a) explores the impact of taste and food deprivation on eating behavior. His results indicate that overweight individuals are unresponsive to food deprivation and highly responsive to the taste of food; normal subjects evince intermediate responsiveness to these two cues; and underweight people are the least responsive to taste. In general, the overweight subjects are less responsive to internal cues than are either normal or underweight subjects. From this data Nisbett draws the same conclusion as Schachter that responsiveness to taste, an external cue, is a positive function of increasing body weight.

Nisbett's 1968b experiment investigates visibility as an environmental cue controlling behavior and the data show that obese individuals eat more when food is visible than do normal and underweight people. However, the overweight subjects eat as little as do the underweight subjects and less than normals when food is available but not visible. Again Nisbett's data lead him to agree with Schachter's hypothesis: "Strong, immediate food stimuli should be hard for the 'external' individual to resist. Weaker, more distant stimuli may go unnoticed by the individual lacking internal motivation

to seek out food" (p. 1255).

The buying behavior of men and women in a supermarket is observed in an unobtrusive measure study (Nisbett and Kanouse, 1969) which takes into account food deprivation as well as visibility of food. Again some support is obtained for Schachter's position: (1) normals buy more food if deprived than if they have recently eaten; and (2) normals shop more slowly than overweights if deprived and more rapidly if they have recently eaten. There is a deviation from the anticipated results which the authors are unable to explain satisfactorily: the obese subjects not only expect to buy, but actually do buy, more food if they have eaten recently than if they are deprived. Nisbett and Kanouse tentatively guess "that eating behavior sometimes triggers a desire in the overweight to buy orgiastically," but this explanation is dismissed by them as having "a somewhat hollow, post hoc ring" (p. 239). Another explanation is possible. While the authors do not control for gender effects, they do report that 81 percent of their sample is female. One could, therefore, ask if this unanticipated result represents gender-related behavior similar to that found by Stunkard and Koch. That is, something akin to an interaction of the female "denial of hunger" and the male "exaggeration of hunger" may be occurring. In any event, since this is one of the few studies designed to test Schachter's hypothesis which has a large female contingent in the experimental sample and which also has unanticipated results, the implication is strong that gender is an influencing factor in eating-related behavior.

While the majority of the obesity studies found in the literature are not concerned with sex as an independent variable, the results of

those obesity treatment studies which are concerned help make an even stronger case for the influence of gender on eating behavior and, by inference, on responsiveness to internal and external stimuli. Lloyd, Wolff, and Whelen (1961) report a longitudinal study involving 98 overweight children (59 girls, 39 boys) whose average age at the beginning of treatment was nine. Follow-up data is available for one, six, and nine years after termination of the original treatment program. The authors find that obesity in childhood is likely to persist into adult life but the outlook for boys is a little better than for girls: by the last follow-up only one-fourth of the subjects are at normal or near normal weight (less than 20 percent overweight) and for girls, but not for boys, the percentage of those who are grossly overweight (more than 80 percent overweight) is higher than at the time of the initial examination prior to treatment.

The outcome of a second treatment program involving total starvation of ten superobese subjects (four males, six females) for two to eight weeks in a hospital setting is described by Spencer (1968). Data collected two to six months after termination of the fast show that, of the women who completed treatment, three gained one to nine pounds and two maintained the weight achieved at the end of their fast. Of the males, three continued to lose weight and one gained a pound. Thus, the females not only differ from the males in the maintenance of weight loss, they also differ over time from the men in terms of who tends to gain weight. The latter replicates the finding of Lloyd, Wolff, and Whelen.

Harris (1969) looks at the effect of treatment with gender as a specific independent variable. She describes a behavior modification

treatment program whose goal is "the development of self-control through altering the stimulus conditions under which the behavior occurs and generating self-produced consequences for the behavior" (p. 264). This can be interpreted in terms of Schachter's hypothesis as an attempt to revise the way in which obese subjects respond to external cues. The experimental group differs significantly in the amount of weight lost ($p < .001$) when compared to the control group which was merely weighed at the beginning and the end of the study. Furthermore, the effect of sex is significant ($p < .05$) for the number of pounds lost and almost significant ($p < .10$) for percentage of weight lost. While Harris does not dismiss the possibility of physiological differences, she also makes a case for differences between men and women in terms of their past learning experiences in order to account for the significant effect of gender in this weight reduction study. She concludes that a "larger study will be necessary to discover the extent and causes of these sex differences ..." (p. 269).

Learning experiences relevant to eating-behavior are studied by Griggs and Stunkard (1964) in an experiment in which information feedback and discrimination training are used to increase the accuracy in the reporting of gastric motility. Although the authors have been able to bring about a long-term increased accuracy in the self-reporting of stomach contractions, a one-year follow-up indicates that this improved accuracy does not alter the experience of hunger or the regulation of food intake. This finding is replicated in Stunkard and Fox's 1971 study. As Harris does, Griggs and Stunkard also infer from their data that "...the obese subject showed that his apparently faulty perception was not due wholly to an imperfect neural apparatus.

These findings suggest that bias in reports of gastric motility can be learned and they imply that the disordered hunger feelings of some obese persons have resulted from past experiences which fostered the development of bias" (p. 89). It can also be inferred from this and other studies discussed above that the learned bias also extends to responses to external food-related cues and differs as a function of gender.

There are several reports in the obesity literature which suggest strongly that one of the factors differentially influencing this learned bias for males and females is the socio-economic class to which the individual belongs. The Midtown Manhattan Study (Moore, Stunkard, and Srole, 1962) is based upon interviews of 1,660 subjects randomly selected from a population of 110,000 people. No significant difference between groups is discovered when normals and obese are compared on overall psychiatric ratings. However, socio-economic status (SES) factors and age are found to play a significant part. Using the SES of the subjects' parents, the authors find an inverse relationship between obesity and SES origin. Specifically, 30 percent of the women of low SES origin are obese while only four percent of those women of high SES origin are found to be obese. Secondly, the prevalence of obesity increases markedly with age: only five percent of women ages 20-24 are obese while 34 percent of those 50-54 are obese. The same relationships, but to a less marked degree, are also found to hold for men. The authors interpret their data concerning the high correlation between obesity and SES to mean "whatever its genetic and biochemical determinants, obesity in man is susceptible to an extraordinary degree of control by social factors" (p. 965).

Using the respondents' own SES, social mobility, and generation in the United States as independent variables, Goldblatt, Moore, and Stunkard (1965) replicate and extend the findings of Moore, et al. They report an inverse relationship between body weight and the subject's own SES that is almost the same as that found to exist between a subject's body weight and the SES of his parents. Thirty percent of the low SES women, 16 percent of the middle SES women, and only five percent of the high SES women are obese. After looking at the correlations between body weight and SES mobility, Goldblatt, et al, report that 17 percent of the females remaining in the SES into which they had been born are obese; 22 percent of those moving down in SES are obese; but only 12 percent of those moving up in SES are obese. The authors also note an inverse relationship between obesity and the number of generations a woman's family has been in the United States: of the first generation subjects, 24 percent are obese; and of the fourth generation subjects only five percent are obese. In general, the relationship between social factors and body weight among males is similar to that found among females, but, as also noted by Moore, et al, and of Goldblatt, et al. Silverstone (1969) reports data obtained from a sample of subjects in London, England. Using scores from the Cornell Medical Index, he finds, as had Moore, Stunkard, and Srole in New York City, that psychological disturbance is of little etiological significance when the obese are compared with normals. Silverstone also finds an inverse relationship between body weight and SES and a positive relationship between body weight and age. Both these relationships, as in the studies cited above, are more marked for women than for men.

A study exploring obesity as a social phenomenon has been carried out in West Germany. Meyer and Tuchelt-Gallwitz (1968) explore the attitudes of others toward the obese and of the obese toward themselves. The data indicates that slim people are characterized by attributes related to effectiveness, activity, dominance, and alertness. Obese individuals are described in terms of such attributes as orality, moodiness, and temperament. The young are more critical of the obese than are the old; men are more critical of the obese than are women; and people of high SES are more critical of the obese than are low SES members. Both the greatest percentage of overweight individuals and the most positive attitude toward fat women are found among those of low SES. These low SES members tend to assign attributes of goodnaturedness to overweight low SES women. In spite of these positive attitudes of others toward the obese, 67 percent of the overweight subjects report that they worry very much about being obese. This worrying increases as weight increases and as age of onset of obesity increases. Furthermore, the obese individuals experience greater difficulty in choosing their own photographs from among distorted pictures than do the normals and the obese also tend to pick more distorted photographs as representing them. These results suggest that because of differential social pressures as a function of social class membership, high, middle, and low SES obese people not only have self-concepts differing from normals of their own SES but also differing from the self-concepts of the obese not of their own SES.

Hypotheses

The following hypotheses are suggested by the above discussion:

1. (a) When external, food-related cues are prominent, food-

deprived obese subjects will eat more than food-deprived normal weight subjects; (b) when external food-related cues are minimized, food-deprived obese subjects will eat less than food-deprived normal weight subjects; and (c) irrespective of cue prominence level, normal weight subjects will eat equal amounts.

2. (a) When external, food-related cues are prominent, food-deprived obese females will eat more than food-deprived obese males; (b) when external, food-related cues are minimized, the obese females and the obese males will eat equal amounts of food and this will be less than either group will eat in the high prominent situation; and (c) in both the high prominent and low prominent food cue conditions, the normal weight females and normal weight males will eat equal amounts of food.

3. (a) The self-concepts of the obese subjects will be more negative than those of the normal weight subjects; (b) the self-concepts of the female obese subjects will be more negative than those of the male obese subjects; and (c) the self-concepts of the normal weight subjects will not differ as a function of gender.

4. The obese will report less anxiety and depression than the nonobese will report.

METHOD

Subject Population

The subject (S) sample for this study consisted of 112 students drawn from the University of Massachusetts undergraduate psychology courses. The Ss were selected on the basis of gender (male and female) and weight (obese and normal). They were exposed to two levels of stimulus prominence (high and low) thus giving eight groups of 14 Ss each (see Appendix for summary of experimental design). In order to establish membership in the normal weight and obese groups, the percent of weight deviation was calculated from the difference between the weight norms published by the Metropolitan Life Insurance Company (1959) and the weight and height initially reported by each S by means of a screening questionnaire (see Appendix). Placement in each group was later verified by actually weighing and measuring each S prior to participation in the experiment. The choice of a Table of Average Weights (see Appendix) which did not take into account the individual's frame was based upon the observation by the Metropolitan Life Insurance Company that "obviously, no single value would apply to all persons of a specified height inasmuch as individuals differ in such respects as chest width and depth, hip width, bone thickness, muscularity, and length of trunk relative to total height ... (However, as) a rule of thumb, if persons of any particular build kept their weight down to the average in the early 20's, it would be fairly close to the desirable weight at ages over 25" (p. 4). Based upon the generally

accepted standard for normal weight reported in the literature, the maximum allowable range of deviation for normals was 10 percent above and below the average. As was done by Nisbett (1968a, 1968b), a five percent weight differential was established to separate the normal group from the obese group. Thus any S 15 percent or more overweight was put in the obese group (see Appendix for table of Weight Ranges for Normal Weight and Overweight Men and Women).

Apparatus

The equipment used in this study was contained in two adjacent rooms which had a one-way mirror in the wall between them. A desk, two chairs, bogus recording electrodes, a Sony T-70 tape recorder, a pre-recorded tape to provide 10 minutes of music, and a Detecto medical scale were contained in the first or experimental room. A polygraph which could be seen through the open door was located in the second room which was used as an "office" by the experimenter (E). In the hallway, directly across from the door to the experimental room, a Coleman ice chest was placed.

Procedure

The procedure was essentially a replication of that used by Nisbett (1968b) but with some deviations. These changes involved the screening process by which Ss were assigned to their respective experimental groups, the actual measuring of each S in order to ascertain the accuracy of the self-reported weight and height, and an increase in both the variety and total amount of food available.

The screening process took place four to six weeks prior to participation in the study. Every student in the undergraduate

psychology classes was asked to voluntarily fill out a screening questionnaire (see Appendix). They were told that if certain unspecified criteria were met they would be contacted by telephone and asked to participate in a study which would be explained at that time. The students were also told that agreement to participate would earn two of the six points they were allowed to add on to their final class grade for participating in psychological experiments.

Six hundred and eighty-six students returned completed questionnaires which were used to assign Ss to the male and female categories and tentatively to the obese and normal groups. This information was also used to exclude from the study any Ss who had an extensive and intensive history of participation in organized sports since any overweight could easily be the result of well-developed musculature rather than excess adiposity.

The Ss who were selected and who agreed to participate were told the study necessitated the measurement of galvanic skin response and respiration and the filling in of a personality questionnaire. In order to insure arrival in a food-deprived state, each S was informed that in order to obtain accurate and comparable base lines no food could be eaten for at least four hours prior to participation. The Ss were also told to skip breakfast, lunch, or dinner if their appointment was, respectively, for the morning, afternoon, or evening. At this point the Ss were also told that since they were being asked to deprive themselves as a favor to the E, the E would provide a free meal as compensation upon completion of participation. Parenthetically it should be noted that upon completion of the study each S was informed as to the deception which was involved in disguising the purposes of

the experiment.

At the beginning of the experiment proper, each S had his or her weight and height measured. These measurements were used as the basis for the final assignment of the S to either the normal weight or the obese group. The S was then seated in a comfortable chair, the electrodes attached, and the tape player started. The E then left the room saying he would return in 10 minutes with the meal as promised, remove the sensors, and explain the questionnaire.

At the end of the 10-minute period, the E opened the experimental room door, placed the meal on the desk where the S would be filling in the questionnaire, and said "Here is the food I promised you. If you want you can eat it while you're filling out the questionnaire or, if you prefer, you can wait until the experiment is completed." If the S had been assigned to the low cue treatment level, the meal consisted of one roast beef sandwich weighing four ounces and wrapped in wax paper, a 10-ounce bottle of diet sugarless cola and a straw, and two cookies weighing 1.5 ounces. The low cue Ss were told there were plenty of sandwiches in the cooler visible just outside the door. If still hungry, the Ss were to feel free to take whatever they wanted. For those Ss in the high cue condition, the meal consisted of three four-ounce roast beef sandwiches each wrapped in wax paper, a 10-ounce bottle of diet soda and a straw, and a bowl of cookies weighing two pounds.

The S was then seated at the desk with the questionnaire (see Appendix for Semantic Differential, Anxiety-Depression Scale, and Rotter Social Reaction Inventory) and the instructions were reviewed with the E. The S was then told, "When you've completed the question-

naire, just drop them off next door at my office on your way out."
The E then went out leaving the door open.

Nisbett stated that several aspects of this procedure lessened the possibility of self-consciousness on the part of overweight Ss. (1) The E was absent while the S ate and the meal was private. The S was able to assume the meal would not be interrupted because he or she was to go to the E's office when finished. (2) The S was told there were plenty of sandwiches in the cooler and could assume that one or two would not be missed if taken. (3) The S was given no reason to assume the E had the remotest interest in how much food was consumed. At the end of each experimental session Nisbett's assumptions were tested by an inquiry into the S's beliefs regarding the goals of the experiment. These assumptions appear to have been supported since not one S labelled food consumption as a dependent variable.

As Nisbett further pointed out, this procedure allowed normals and overweight Ss access to as much food as they wanted to eat. The only difference between experimental conditions was the amount of food placed on the table in front of the S. The weight of the food actually consumed was used to compare the eating behavior of the various groups. This weight was determined by carefully weighing the amount of food placed before the S, weighing the food remaining after the S left, and subtracting the latter from the former. In order to make comparisons across genders, the amount of food eaten was also converted into percentage of body weight. The one-way mirror permitted the E to determine that the food was actually eaten and not merely removed from the experimental room and eaten later.

The questionnaire consisted of the Semantic Differential, the

Rotter Social Reaction Inventory, and the Anxiety-Depression Scale. Their purpose was to explore the relationships between various personality variables and obesity.

Differences in self-concept between normal weight and obese Ss were explored by means of the Semantic Differential (Osgood, Suci, and Tannenbaum, 1957). Three concepts (Me, Me As I Would Like To Be, As Others See Me) representing the personal self, the ideal self, and the public self were measured along three dimensions (Evaluative, Potency, Activity) each represented by four bipolar adjective scales. The scales representing the evaluative factor consisted of clean-dirty, good-bad, fair-unfair, and honest-dishonest. The potency dimension was measured along the following scales: large-small, strong-weak, heavy-light, and hard-soft. The third dimension, activity, was assessed via the scales sharp-dull, hot-cold, active-passive, and fast-slow. Each scale was responded to along a seven-point continuum. In order to avoid response bias tendencies, the bipolar pairs were randomly reversed. It was possible for a S to obtain a score ranging from four to 28 on each of the three factors being assessed. The higher the score, the more positive the self-concept is assumed to be by Osgood, et al, while the lower the score, the more negative the self-concept is assumed to be. The standard instructions developed by Osgood, et al, were used.

A 44-item scale prepared by Shipman and Plesset (1963) was used to assess differences in levels of anxiety and depression between normal weight and overweight Ss. The 20 anxiety items of the Anxiety-Depression Scale were derived from the Taylor Manifest Anxiety Scale (Taylor, 1953) and the 24 depression questions were drawn from the

Minnesota Multiphasic Personality Inventory. The short form of the Anxiety Scale was demonstrated by Bendig (1956) to yield high agreement with clinicians' ratings of manifest anxiety while Shipman and Plesset found the split-half reliability to be 0.90 and the three weeks retest reliability to be 0.85. Canter (1960) demonstrated the validity of the short Depression Scale by showing that it clearly discriminated between suicidal psychiatric patients, non-suicidal psychiatric patients, and normals. In their reliability testing of the Anxiety-Depression Scale, Shipman and Plesset obtained a split-half reliability 0.72 and a three weeks retest reliability of 0.74. The authors interpreted these indices of test efficiency to mean their scale had adequate validity and reliability. Therefore the higher a S's score on each of the subscales, the higher the level of anxiety and/or depression was considered to be.

RESULTS

Statistical Analysis Using Weight in Ounces of Total Amount of Food Consumed.

Hypothesis 1.

The first hypothesis was only partially supported. The data derived from the normal weight males and females and the obese males replicated the results of Nisbett's study, but the data derived from the obese females did not. Thus, when the data based on all the Ss used in this study were examined statistically, the analysis of variance for weight in ounces of total amount of food consumed (tables 1 and 2) failed to provide support for Schachter's contention that the effect of weight and the effect of the interaction of weight x cue were sufficient to obtain his results, e.g. increasing cue prominence led to an increase in food consumption by the obese while the food consumption of normals remained the same across cue level.

Hypothesis 1(a) stated that "when external, food-related cues are prominent, food-deprived obese Ss will eat more than food-deprived normal weight Ss...", but the weight x cue interaction (table 1; figure 1) was not significant and, as shown in table 3, the high cue obese did not differ significantly from the high cue normals in the amount of food consumed.

Hypothesis 1(b) predicted that "when external food-related cues are minimized, food-deprived obese Ss will eat less than food-deprived

normal weight Ss...". Again the data analysis failed to provide support for Schachter. Figure 1 and table 3 show, contrary to the prediction, that the pooled male and female low cue obese Ss actually ate more ($p < .005$), not less, than the pooled low cue normal Ss.

The third part of the first hypothesis predicted that "irrespective of cue prominence level, normal weight Ss will eat equal amounts." Here the statistical analysis replicated Schachter's results. Although both high cue normal males and high cue normal females tended to eat more than their low cue counterparts, table 4 indicates that the differences were not significant.

Thus, because gender was not taken into account, it must be concluded that the first hypothesis, which required a replication of Nisbett's results, was supported only by the consumatory behavior of the normal Ss. These results were duplicated by the statistical analysis using percent of body weight in total amount of food consumed (see Appendix).

Hypothesis 2.

The contention was supported that there would be a difference between the eating behavior of obese males and that of obese females, but the obtained differences for the most part were in the opposite direction to those predicted by hypothesis 2.

The data analysis did not support the prediction of hypothesis 2(a) that "when external food-related cues are prominent, food-deprived obese females will eat more than food-deprived obese males...". While table 4 reveals a highly significant ($p < .0005$) difference between the total amount of food eaten by the high cue male obese and the high cue

female obese, the direction of the difference was opposite to that predicted. This difference cannot be attributed simply to males eating more than females. There was a significant increase ($p < .001$) in the amount eaten by high cue obese males over that consumed by low cue obese males, but it must be noted that food intake decreased from low cue obese female to high cue obese female and this decrease approached significance ($p < .10$).

Hypothesis 2(b), "when external food-related cues are minimized, the obese females and the obese males will eat equal amounts of food and this will be less than either group will eat in the high prominent situation...", was partially supported. According to table 4 and figure 2, rather than eating the predicted equal amount in ounces, the low cue obese female group ate significantly less ($p < .025$) than the low cue obese males. This difference, however, became insignificant when the weight of food consumed was converted to percent of body weight consumed (see Appendix) thus providing partial support for hypothesis 2(b). However, the low cue obese females consumed more, not less, than the high cue obese females and this difference approached significance ($p < .10$). In the shift from low to high cue, the obese males did behave as predicted. The low cue obese male group ate significantly less ($p < .001$) than did the high cue obese group.

Hypothesis 2(c) stated that "in both the high prominent and low prominent food cue conditions, the normal weight females and normal weight males will eat equal amounts of food." The data analysis of weight in ounces (table 4) provided only partial support for this prediction. The prediction was not supported when males were compared to females. In both cue conditions, normal weight males

ate significantly more than did normal weight females. In the low cue condition the difference was significant at the .005 level and in the high cue condition the difference was significant at the .05 level. This finding was in keeping with previous results which indicated that males groups consumed more, on the average, than their female counterpart groups. However, when the genders were considered separately, as predicted there was no significant difference in the total amount of food consumed between the low cue normal female group and the high cue normal female group and between the respective normal male groups.

The conversion of the data to the percent of body weight in total amount of food consumed (see Appendix) resulted in the disappearance of the significant differences between the normal males and females in both the low and high cue conditions, and, thus, complete support of hypothesis 2(c).

TABLE 1.

Analysis of Variance of Total Weight in Ounces of Food Consumed.

Source	df	MS	F	P
Sex	1	878.92	41.63	$<.001$
Weight	1	81.01	3.84	n.s.
Cue	1	68.75	3.26	n.s.
Sex x Weight	1	76.81	3.64	n.s.
Sex x Cue	1	112.50	5.33	$<.025$
Weight x Cue	1	5.25	0.25	n.s.
Sex x Weight x Cue	1	104.63	4.96	$<.05$
Error (S/XWC)	104	21.11		

TABLE 2.

Cell Means and Standard Deviations of the Analysis of Variance of Total Weight in Ounces of Food Consumed.

Source		Means (Standard Deviations)	
Sex		Female	Male
		10.81	16.41
Weight		Obese	Normal
		14.46	12.76
Cue		High	Low
		14.39	12.83
Sex x Weight		Obese	Normal
	Female	10.83	10.79
	Male	18.09	14.73
Sex x Cue		High	Low
	Female	10.58	11.03
	Male	18.20	14.63
Weight x Cue		High	Low
	Obese	15.03 (5.16)	13.89 (3.43)
	Normal	13.76 (5.14)	11.76 (3.20)
Sex x Weight x Cue		Female	
		High	Low
	Obese	9.43 (6.35)	12.23 (4.38)
	Normal	11.75 (4.50)	9.82 (4.05)
		Male	
	Obese	20.63 (3.96)	15.55 (2.48)
	Normal	15.77 (5.77)	13.70 (2.35)

FIGURE 1.

Mean Weight in Ounces of Total Amount of Food Consumed as a Function of the Interaction of Weight and Cue.

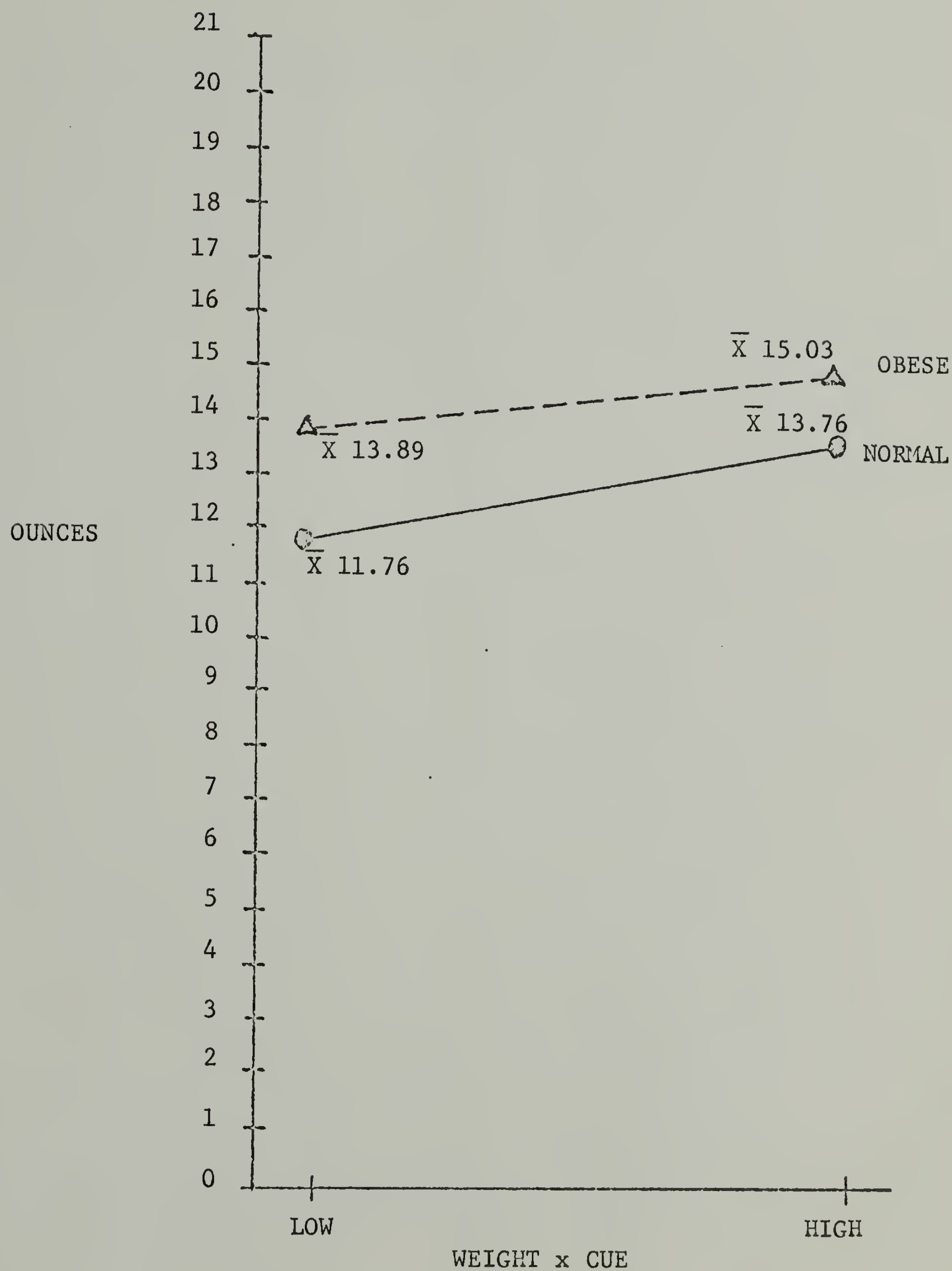


TABLE 3.

Weight in Ounces of Total Food Consumed as a Function of the Interaction of Weight and Cue: The Results of One Tail t-Tests (df-54) on the Difference between the Means.

	$\bar{X}_1-\bar{X}_2$	t	P
High Obese - High Normal	1.2700	0.9227	n.s.
Low Obese - Low Normal	2.1300	2.4027	$<.005$
High Normal - Low Normal	2.0000	1.7479	$<.05$
High Obese - Low Obese	1.0500	0.8967	n.s.

FIGURE 2.

Mean Weight in Ounces of Total Amount of Food Consumed as a Function of the Interaction of Gender, Weight, and Cue.

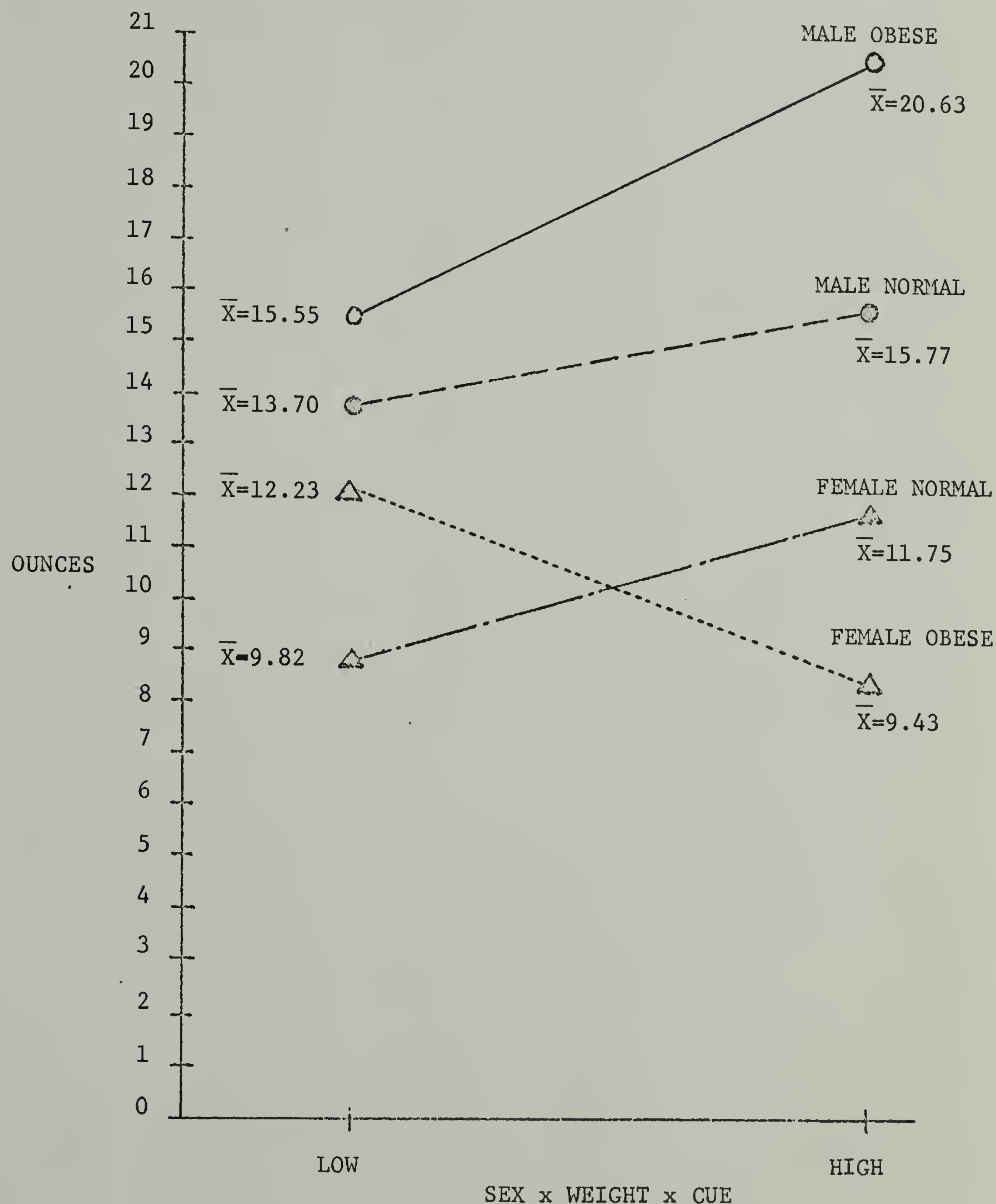


TABLE 4.

Weight in Ounces of Total Amount of Food Consumed as a Function of the Interaction of Gender, Weight, and Cue: The Results of One Tail t-Tests (df=26) on the Difference between the Means.

	$\bar{X}_1-\bar{X}_2$	t	P
Low Male Obese - High Male Obese	-5.0710	-4.0600	<.001
Low Male Normal - High Male Normal	-2.0720	-1.2449	n.s.
Low Female Obese - High Female Obese	2.8030	1.3580	(<.10)
Low Female Normal - High Female Normal	1.9290	1.1917	n.s.
Low Female Obese - Low Female Normal	2.4110	1.5128	(<.10)
High Female Normal - High Female Obese	2.3210	1.1153	n.s.
Low Male Obese - Low Male Normal	1.8580	2.0372	<.05
High Male Obese - High Male Normal	4.8570	2.5962	<.01
High Male Obese - High Female Obese	11.2000	5.5972	<.0005
Low Male Obese - Low Female Obese	3.3200	2.4680	<.025
Low Male Normal - Low Female Normal	3.8800	3.1005	<.005
High Male Normal - High Female Normal	4.0200	1.9556	<.05

Statistical Analysis Using Semantic Differential Scores.

Hypothesis 3.

Hypothesis 3(a) predicted that "the self-concepts of the obese subjects will be more negative than those of the normal weight subjects...". It was not supported by the results along the evaluative (tables 5 and 6) and activity (tables 15 and 16) dimensions for in neither case was the main effect of weight significant.

On the potency dimension there was a significant ($p < .001$) weight main effect (tables 9 and 10; figure 4) and a highly significant ($p < .005$) weight x repetition interaction (tables 9, 10, and 12; figure 6). In the context of Osgood, et al's (1957) assumption that a higher score always represented a more positive self-image, one might conclude on the basis of the higher obese than normal score in the weight main effect that the hypothesis had not been supported. However, figure 6 shows that although the obese rated themselves higher than the normals on all three self-concept scales, the obese ideally wanted to be less potent while the normals wanted to be more potent. Apparently the higher Me and Public Me ratings of the obese represented negative perceptions the reduction of which were desirable. Therefore, the results along the potency dimension provided support for hypothesis 3(a).

The evaluative, activity, and potency data were pooled to obtain the total score. The analysis of the total scores led to a significant ($p < .001$) main effect due to weight (tables 19 and 20; figure 9) and to a weight x repetition interaction effect significant at less than the .001 level (tables 19, 20, and 21; figure 10). Unlike

in the analysis of the potency data, all the obese cell means relevant to these two effects were higher than for the normals (figures 9 and 10). The pooled, very large Ideal Me increases for both obese females and obese males along the activity and evaluative dimensions hid the potency Ideal Me decreases for the obese females and the relative lack of change for obese males and normal females across all three self-concepts along the potency dimension. All eight experimental groups therefore showed an increase in Ideal Me total score ratings with the only noticeable difference between the groups being the lesser increase for the obese female Ideal Me ratings. Furthermore, except for the female obese Ideal Me scores, the obese groups' average total scores were higher than those of the normals (table 11; figure 5). These results did not support the hypothesis but, to the contrary, gave the appearance that the obese had a more positive self-image than the normals. The pooled total score results hid the data which demonstrated that the meaning and direction of "positive" shifted as functions of which self-concept dimension and which independent variables, such as weight and gender, were being considered. In terms of hypothesis 3(a) this meant that, on the average, the obese felt as positively about themselves as do normals; that along the dimension of potency the self-concepts of the obese were more negative than those of normal weight subjects; and that this negative evaluation was based on reaction to, at most, only two of the four bipolar scales used to measure the potency dimension.

The prediction of hypothesis 3(b) was that "the self-concepts of the female obese subjects will be more negative than those of the male obese subjects...". As with the previous hypothesis, neither

the evaluative nor the activity dimension data analysis supported the prediction. Not one of the 12 male obese and female obese comparisons made along the evaluative dimension and across the three self-concepts (table 7; figure 3 was significant. Furthermore, although the differences were not significant, the obese females tended to rate themselves slightly higher than did the obese males.

Along the activity dimension only two of the 12 male obese and female obese comparisons resulted in significant differences (table 17; figure 8), but in both cases the high cue female obese subjects rated themselves higher, not lower as predicted, than did the low cue obese male subjects. The difference for the Personal Self was significant at less than the .01 level and for the Public Self at less than the .05 level.

The analysis of scores on the potency dimension strongly supported hypothesis 3(b) (table 13; figure 7). Not one of the differences resulting from the eight comparisons of obese female and obese male scores for Me and Public Me were significant. The four comparisons made for the Ideal Self were extremely significant, all at less than the .0005 level, with the two obese male groups rating themselves much higher than the two obese female groups rated themselves. Also, as figure 7 shows, the two male obese groups' scores remained high and relatively unchanged across all three self-concepts. Both female obese groups, on the other hand, showed a large Ideal Me drop. Thus, even though the obese female Me and Public Me self-images were scored numerically approximately the same as those for obese males, because of the Ideal Me rating drop, the former numbers represented a negative evaluation of self while the male ratings appeared to represent a

more positive self-evaluation.

The total score evaluation results (table 22; figure 11) provided some support for hypothesis 3(b). There were no significant differences between obese females and obese males on the basis of their respective Public Me ratings and no significant differences between the high cue obese male group and the two obese female groups in terms of their Me scores. Both obese female groups' Me scores were also significantly higher, rather than lower as predicted, than the low cue obese male group's Personal Self rating. The hypothesis received strong support, however, when the Ideal Me scores were compared: the high cue female obese group rated itself significantly lower ($p < .025$) than both the high and low cue obese male groups rated themselves; and the low cue obese female group's score was very significantly less ($p < .005$) than those of each of the obese male groups.

The last part of the third hypothesis predicted that "the self-concepts of the normal weight subjects will not differ as a function of gender." Along the evaluative dimension, almost all the normal weight male and normal weight female comparisons (table 8; figure 3), e.g. 11 out of 12, resulted in nonsignificant differences. Only the difference between the Personal Self ratings of high cue normal males and high cue normal females was significant ($p < .05$) with the males scoring themselves higher. For the most part hypothesis 3(c) was supported by the evaluative dimension data analysis results.

The potency dimension results (table 14; figure 7) provided partial support for the hypothesis on the basis of the Personal Self and Public Self ratings of the male and female normals. None of the differences resulting from these comparisons were significant. The

Ideal Me scores presented a different picture (figure 7). Both normal female groups appeared to be satisfied with their Personal and Public Selves because their Ideal Self scores increased only slightly. The normal males, on the other hand, wished to be more potent and their Ideal Me scores increased markedly with the result that in table 14 three out of four differences between normal males and normal females reached significance and the fourth difference approached significance.

The hypothesis was totally supported by the activity dimension data analysis (table 18; figure 8). All four of the normal male and normal female comparisons for each of the three self-concepts resulted in nonsignificant differences.

The total score analysis (table 23; figure 11) provided only partial support. There were no differences, as predicted, between normal females and normal males in their Personal Self and Public Self ratings. However, normal males increased their Ideal Me scores more than the normal females increased their Ideal Me ratings. The differences between the high cue normal male group and each of the normal female groups were significant at less than the .005 level while the differences between the low cue normal male group and the two normal female groups were significant at less than the .05 level.

In sum, the Personal Self and Public Self results generally provided support for hypothesis 3(c). The major deviations from the predicted outcome occurred in the Ideal Me data where the normal males along the potency dimension and in the total score rated themselves higher than did the normal females.

TABLE 5.

Analysis of Variance of Evaluative Scores from Semantic Differential.

Source	df	MS	F	P
Sex	1	0.96	0.06	n.s.
Weight	1	4.30	0.25	n.s.
Cue	1	10.71	0.61	n.s.
Repetition	2	218.80	12.55	<.001
Sex x Weight	1	29.76	1.71	n.s.
Sex x Cue	1	26.30	1.51	n.s.
Weight x Cue	1	1.44	0.08	n.s.
Sex x Repetition	2	2.39	0.14	n.s.
Weight x Repetition	2	0.80	0.05	n.s.
Cue x Repetition	2	2.04	0.12	n.s.
Sex x Weight x Cue	1	21.00	1.20	n.s.
Sex x Weight x Repetition	2	0.05	0.00	n.s.
Sex x Cue x Repetition	2	1.08	0.06	n.s.
Weight x Cue x Repetition	2	2.58	0.15	n.s.
Error (S/XWC)	104	17.44		
Sex x Weight x Cue x Repetition	2	0.14	0.05	n.s.
Error (SR/XWC)	208	2.78		

TABLE 6.

Cell Means and Standard Deviations of the Analysis of Variance of Evaluative Scores from the Semantic Differential.

Source		Means (Standard Deviations)		
Sex		Female	Male	
		24.49	24.39	
Weight		Obese	Normal	
		24.55	24.33	
Cue		High	Low	
		24.26	24.62	
Repetition		Me	Ideal Me	Public Me
		23.68	26.05	23.59
Sex x Weight		Obese	Normal	
	Female	24.90	24.08	
	Male	24.20	24.57	
Sex x Cue		High	Low	
	Female	24.04	24.95	
	Male	24.49	24.29	
Weight x Cue		High	Low	
	Obese	24.44	24.67	
	Normal	24.08	24.57	
Sex x Repetition		Me	Ideal Me	Public Me
	Female	23.61	26.27	23.61
	Male	23.75	25.84	23.57
Weight x Repetition		Me	Ideal Me	Public me
	Obese	23.82	26.07	23.77
	Normal	23.54	26.04	23.41

Table 6 continued on next page.

TABLE 6. (continued)

Source		Means (Standard Deviations)		
Cue x Repetition		Me	Ideal Me	Public Me
	High	23.36	25.89	23.54
	Low	24.00	26.21	23.64
Sex x Weight x Cue		Female		
		High	Low	
	Obese	24.76	25.05	
	Normal	23.31	24.86	
		Male		
	Obese	24.12	24.29	
	Normal	24.86	24.29	
Sex x Weight x Repetition		Female		
		Me	Ideal Me	Public Me
	Obese	24.04	26.57	24.11
	Normal	23.18	25.96	23.11
		Male		
	Obese	23.61	25.57	23.43
	Normal	23.89	26.11	23.71
Sex x Cue x Repetition		Female		
		Me	Ideal Me	Public Me
	High	22.89	25.89	23.32
	Low	24.32	26.64	23.89
		Male		
	High	23.82	25.89	23.75
	Low	23.68	25.79	23.39

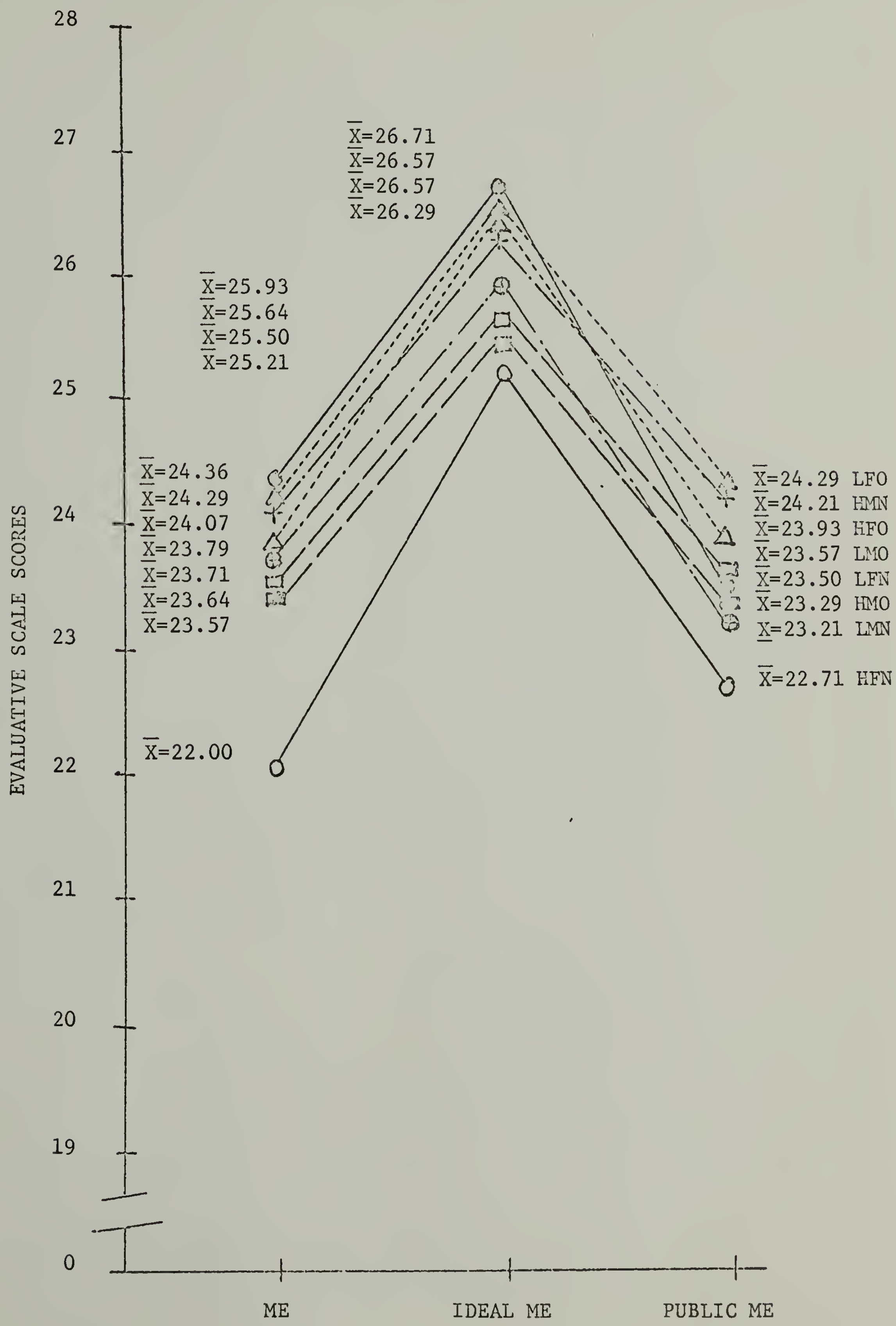
Table 6 continued on next page.

TABLE 6. (continued)

Source		Means (Standard Deviation)		
Weight x Cue x Repetition			Obese	
		Me	Ideal Me	Public Me
	High	23.68	26.04	23.61
	Low	23.96	26.11	23.93
			Normal	
	High	23.04	25.75	23.46
	Normal	24.04	26.32	23.36
Sex x Weight x Cue x Repetition			Female Obese	
		Me	Ideal Me	Public Me
	High	23.79 (3.17)	26.57 (2.56)	23.93 (2.94)
	Low	24.29 (2.05)	26.57 (1.55)	23.93 (2.02)
			Female Normal	
	High	22.00 (3.23)	25.21 (2.21)	22.71 (3.47)
	Low	24.36 (3.22)	26.71 (1.58)	23.50 (3.52)
			Male Obese	
	High	23.57 (2.44)	25.50 (1.80)	23.29 (3.13)
	Low	23.64 (2.32)	25.64 (2.19)	23.57 (2.64)
			Male Normal	
	High	24.07 (2.92)	26.29 (1.87)	24.21 (3.08)
	Low	23.71 (2.86)	25.93 (1.49)	23.21 (3.80)

FIGURE 3.

Mean Evaluative Scores from the Semantic Differential as a Function of the Interaction of Gender, Weight, Cue, and Repetition.



SEX x WEIGHT x CUE x REPETITION

TABLE 7.

Evaluative Scores: The Results of One Tail t-Tests (df=26) on the Difference between the Means for Male Obese Subjects and Female Obese Subjects.

ME	$\overline{X}_1-\overline{X}_2$	t	P
High Male Obese - High Female Obese			
	-0.2200	-0.2057	n.s.
High Male Obese - Low Female Obese			
	-0.7200	-0.8454	n.s.
Low Male Obese - High Female Obese			
	-0.1500	-0.1428	n.s.
Low Male Obese - Low Female Obese			
	-0.6500	-0.7856	n.s.
High Male Obese - Low Male Obese			
	-0.0700	-0.0821	n.s.
High Female Obese - Low Female Obese			
	-0.5000	-0.5898	n.s.
IDEAL ME			
High Male Obese - High Female Obese			
	-1.0700	-1.2794	($<$.15)
High Male Obese - Low Female Obese			
	-1.0700	-1.6855	($<$.10)
Low Male Obese - High Female Obese			
	-0.9300	-1.0329	n.s.
Low Male Obese - Low Female Obese			
	-0.9300	-1.2970	($<$.15)

Table 7 continued on next page.

TABLE 7. (continued)

IDEAL ME, cont.	$\overline{X}_1-\overline{X}_2$	t	P
High Male Obese - Low Male Obese			
	-0.1400	-0.1848	n.s.
High Female Obese - Low Female Obese			
	0.0000	0.0000	n.s.
PUBLIC ME			
High Male Obese - High Female Obese			
	-0.6400	-0.5576	n.s.
High Male Obese - High Female Obese			
	-1.0000	-1.0045	n.s.
Low Male Obese - High Female Obese			
	-0.3600	-0.3409	n.s.
Low Male Obese - Low Female Obese			
	-0.7200	-0.8100	n.s.
High Male Obese - Low Male Obese			
	-0.2800	-0.2558	n.s.
High Female Obese - Low Female Obese			
	-0.3600	-0.3776	n.s.

TABLE 8.

Evaluative Scores: The Results of One Tail t-Tests (df=26) on the Difference between the Means for Normal Weight Males and Normal Weight Females.

ME	$\overline{X}_1-\overline{X}_2$	t	P
High Male Normal - High Female Normal	2.0700	1.7788	<.05
Low Male Normal - Low Female Normal	-0.6500	-0.5647	n.s.
High Male Normal - Low Male Normal	0.3600	0.3295	n.s.
High Female Normal - Low Female Normal	-2.3600	-1.5885	(<.10)
Low Male Normal - High Female Normal	1.7100	1.0156	n.s.
High Male Normal - Low Female Normal	-0.2900	-0.2496	n.s.
IDEAL ME			
High Male Normal - High Female Normal	1.0800	1.3957	(<.10)
Low Male Normal - Low Female Normal	-0.7800	-1.3439	(<.10)
High Male Normal - Low Male Normal	0.3600	0.5633	n.s.
High Female Normal - Low Female Normal	-1.5000	-2.0658	<.025
Low Male Normal - High Female Normal	0.7200	1.0107	(<.15)

Table 8 continued on next page.

TABLE 8. (continued)

IDEAL ME, cont.	$\overline{X}_1-\overline{X}_2$	t	P
High Male Normal - Low Female Normal			
	-0.4200	-0.6419	n.s.
PUBLIC ME			
High Male Normal - High Female Normal			
	1.5000	1.2097	(<.15)
Low Male Normal - Low Female Normal			
	-0.2900	-0.2095	n.s.
High Male Normal - Low Male Normal			
	1.0000	0.7649	n.s.
High Female Normal - Low Female Normal			
	-0.7900	-0.5980	n.s.
Low Male Normal - High Female Normal			
	0.5000	0.3636	n.s.
High Male Normal - Low Female Normal			
	0.7100	0.5680	n.s.

TABLE 9.

Analysis of Variance of Potency Scores from Semantic Differential.

Source	df	MS	F	P
Sex	1	150.67	6.72	$<.025$
Weight	1	832.86	37.14	$<.001$
Cue	1	46.50	2.07	n.s.
Repetition	2	10.75	0.48	n.s.
Sex x Weight	1	35.36	1.58	n.s.
Sex x Cue	1	30.36	1.35	n.s.
Weight x Cue	1	2.86	0.13	n.s.
Sex x Repetition	2	152.71	6.81	.005
Weight x Repetition	2	142.01	6.33	.005
Cue x Repetition	2	0.44	0.02	n.s.
Sex x Weight x Cue	1	0.15	0.01	n.s.
Sex x Weight x Repetition	2	1.23	0.05	n.s.
Sex x Cue x Repetition	2	7.58	0.34	n.s.
Weight x Cue x Repetition	2	3.19	0.14	n.s.
Error (S/XWC)	104	22.43		
Sex x Weight x Cue x Repetition	2	2.01	0.31	n.s.
Error (SR/XWC)	208	6.48		

TABLE 10.

Cell Means and Standard Deviations of the Analysis of Variance of Potency Scores from the Semantic Differential.

Source		Means (Standard Deviations)		
Sex		Female	Male	
		16.18	17.52	
Weight		Obese	Normal	
		18.42	15.27	
Cue		High	Low	
		17.22	16.48	
Repetition		Me	Ideal Me	Public me
		16.78	17.19	16.58
Sex x Weight		Obese	Normal	
	Female	17.43	14.93	
	Male	19.42	15.62	
Sex x Cue		High	Low	
	Female	16.25	16.11	
	Male	18.19	16.85	
Weight x Cue		High	Low	
	Obese	18.70	18.14	
	Normal	15.74	14.81	
Sex x Repetition		Me	Ideal Me	Public me
	Female	17.00	15.20	16.34
	Male	16.55	19.18	16.82

Table 10 continued on next page.

TABLE 10. (continued)

Source		Means (Standard Deviations)		
Weight x Repetition		Me	Ideal Me	Public Me
	Obese	19.07	17.46	18.73
	Normal	14.48	16.91	14.43
Cue x Repetition		Me	Ideal Me	Public Me
	High	17.21	17.55	16.89
	Low	16.34	16.82	16.27
Sex x Weight x Cue		Female		
		High	Low	
	Obese	17.43	17.43	
	Normal	15.07	14.79	
		Male		
	Obese	19.98	18.86	
	Normal	16.40	14.83	
Sex x Weight x Repetition			Female	
		Me	Ideal Me	Public Me
	Obese	18.93	15.07	18.29
	Normal	15.07	15.32	14.39
			Male	
	Obese	19.21	19.86	19.18
	Normal	13.89	18.50	14.46

Table 10 continued on next page.

TABLE 10. (continued)

Source		Means (Standard Deviations)		
Sex x Cue x Repetition			Female	
		Me	Ideal Me	Public Me
	High	16.89	15.54	16.32
	Low	17.11	14.86	16.36
			Male	
	High	17.54	19.57	17.46
	Low	15.57	18.79	16.18
Weight x Cue x Repetition			Obese	
		Me	Ideal Me	Public Me
	High	19.61	17.68	18.82
	Low	18.54	17.25	18.64
			Normal	
	High	14.82	17.43	14.96
	Low	14.14	16.39	13.89

Table 10 continued on next page.

TABLE 10. (continued)

Source		Means (Standard Deviations)		
Sex x Weight x Cue x Repetition			Female Obese	
		Me	Ideal Me	Public Me
	High	18.79 (2.27)	15.36 (2.77)	18.14 (3.70)
	Low	19.07 (3.20)	14.79 (3.21)	18.43 (3.66)
			Female Normal	
	High	15.00 (3.02)	15.71 (2.84)	14.50 (4.00)
	Low	15.14 (4.85)	14.93 (3.39)	14.29 (3.63)
			Male Obese	
	High	20.43 (3.29)	20.00 (2.04)	19.50 (3.38)
	Low	18.00 (4.04)	19.71 (1.91)	18.86 (3.20)
			Male Normal	
	High	14.64 (2.06)	19.14 (2.88)	15.43 (3.46)
	Low	13.14 (2.77)	17.86 (4.44)	13.50 (3.56)

FIGURE 4.

Mean Potency Scores from the Semantic Differential as a Function of Weight.

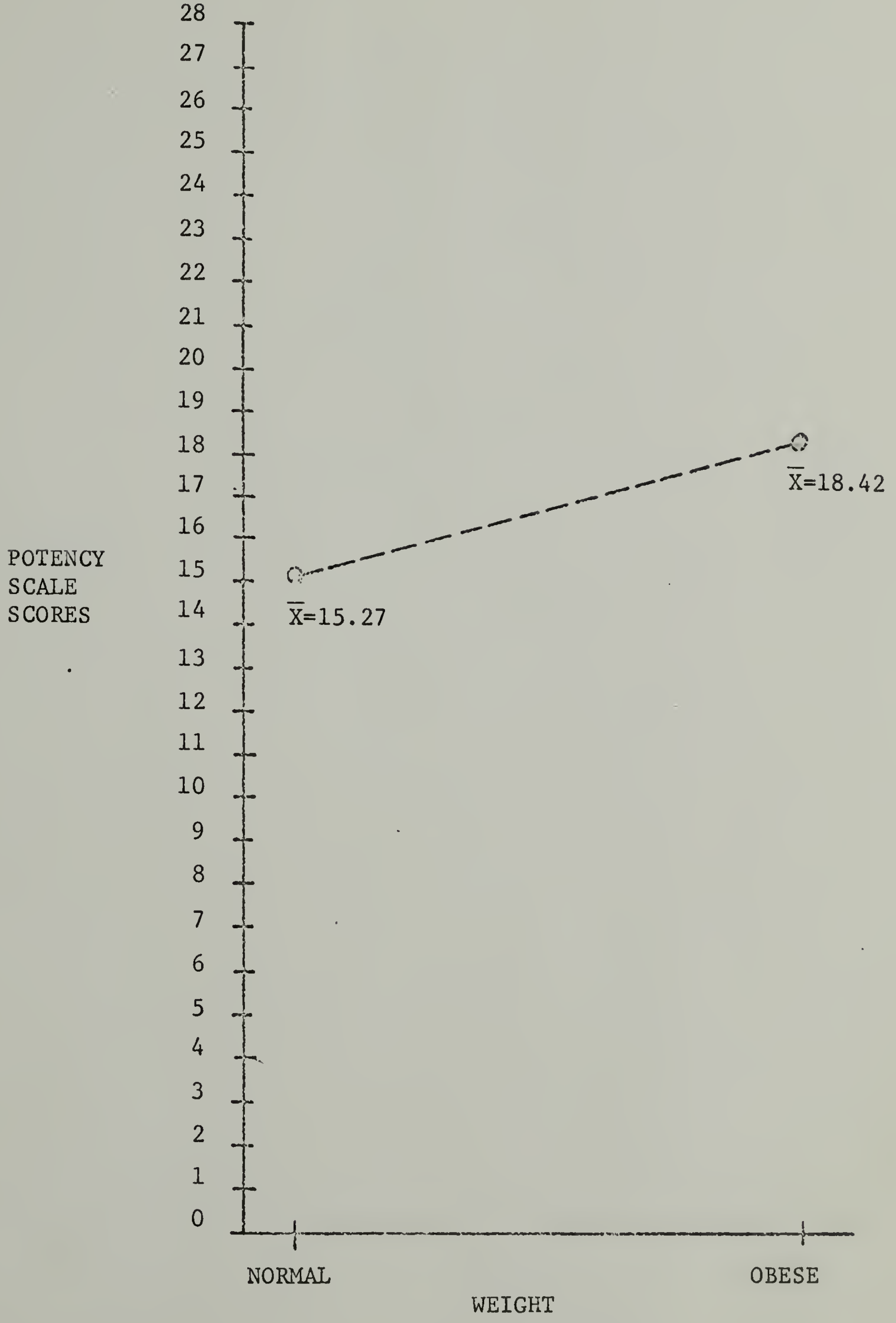


FIGURE 5.

Mean Potency Scores from the Semantic Differential as a Function of the Interaction of Gender and Repetition.

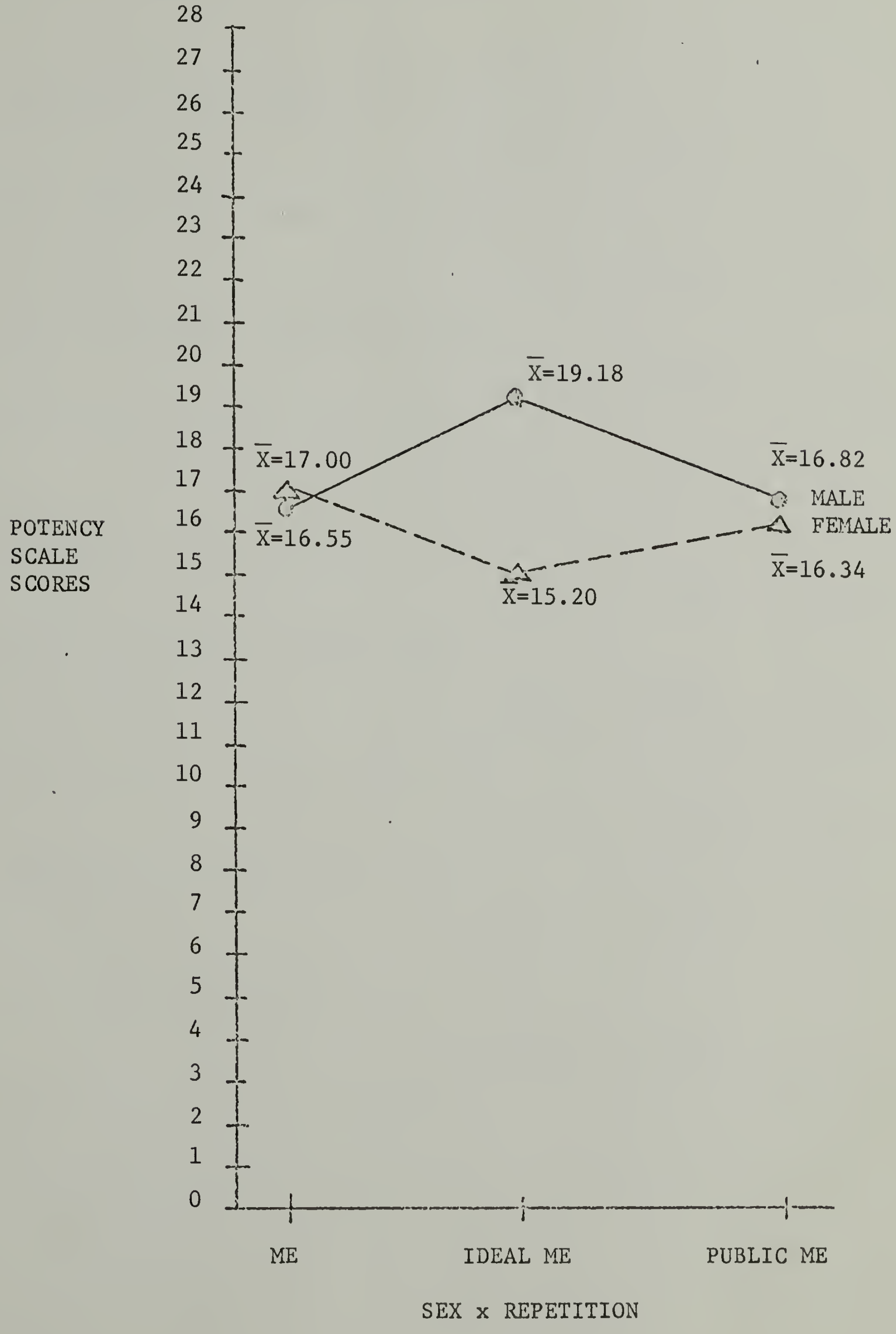


TABLE 11.

Semantic Differential Potency Score as a Function of the Interaction of Gender and Repetition: The Results of One Tail t-Tests (df=104) on the Difference between the Means.

	$\overline{X}_1-\overline{X}_2$	t	P
Female (Me) - Male (Me)			
	0.4463	0.7156	n.s.
Male (Ideal Me) - Female (Ideal Me)			
	3.9820	6.9627	$<.001$
Male (Public Me) - Female (Public Me)			
	0.4820	0.6766	n.s.
Female (Me) - Female (Ideal Me)			
	1.8035	2.9173	$<.005$
Male (Me) - Male (Ideal Me)			
	-2.6248	-4.5435	$<.001$
Female (Ideal Me) - Female (Public Me)			
	-1.1430	-1.6958	$<.05$
Male (Ideal Me) - Male (Public Me)			
	2.3570	3.8952	$<.001$
Female (Me) - Female (Public Me)			
	0.6605	0.9679	n.s.
Male (Me) - Male (Public Me)			
	-0.2678	-0.4339	n.s.

FIGURE 6.

Mean Potency Scores from the Semantic Differential as a Function of the Interaction of Weight and Repetition.

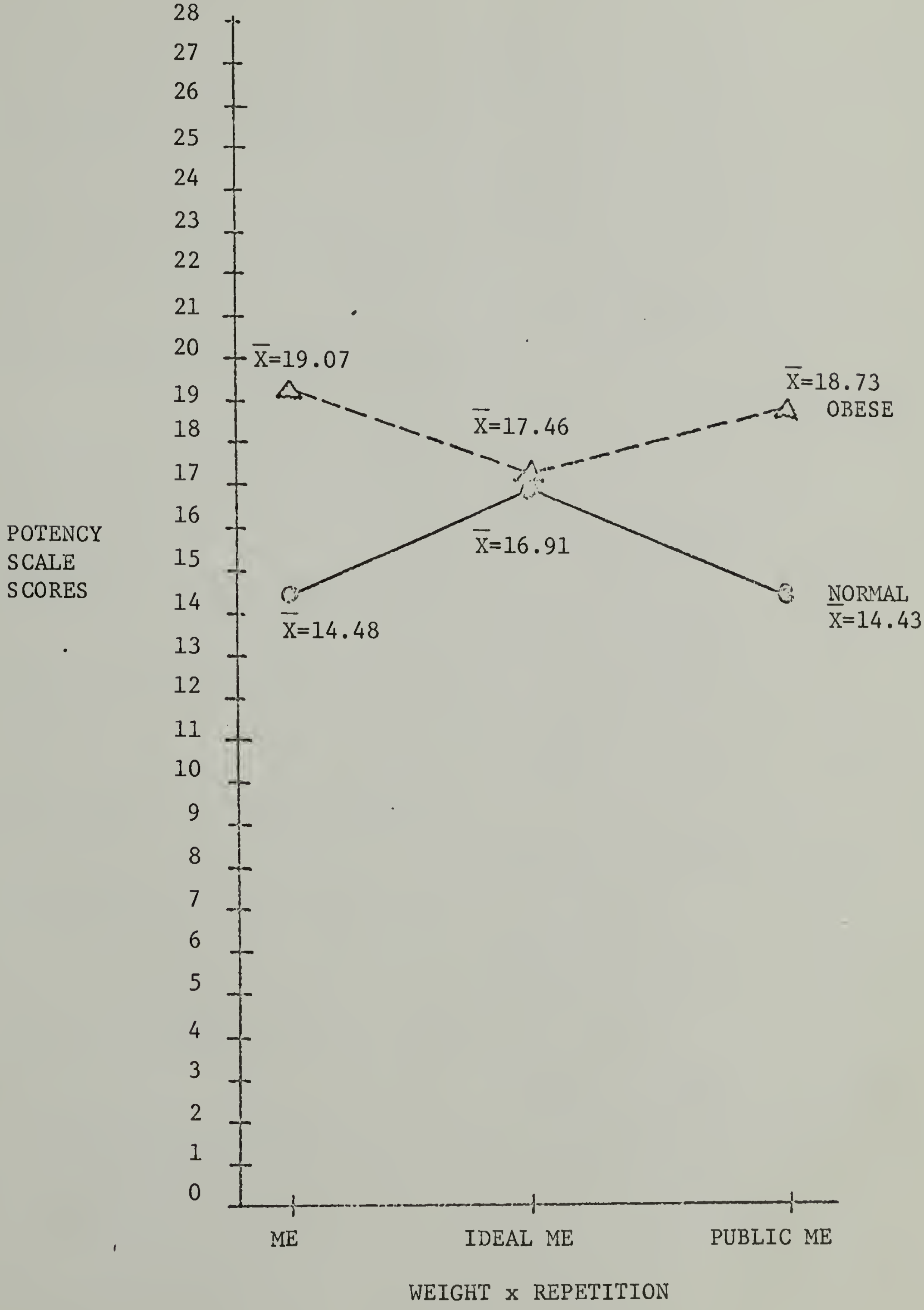


TABLE 12.

Semantic Differential Potency Scores as a Function of the Interaction of Weight and Repetition: The Results of One Tail t-Tests (df=104) on the Difference between the Means.

	$\bar{X}_1-\bar{X}_2$	t	P
Obese (Me) - Normal (Me)			
	4.5893	7.3605	<.001
Obese (Ideal Me) - Normal (Ideal Me)			
	0.5535	0.9678	n.s.
Obese (Public Me) - Normal (Public Me)			
	4.3035	6.3604	<.001
Obese (Me) - Obese (Ideal Me)			
	1.6073	2.9123	<.005
Obese (Me) - Obese (Public Me)			
	0.3393	0.5317	n.s.
Obese (Ideal Me) - Obese (Public Me)			
	-1.2680	-2.1990	<.025
Normal (Me) - Normal (Ideal Me)			
	-2.4285	-3.7868	<.001
Normal (Me) - Normal (Public Me)			
	0.0535	0.0807	n.s.
Normal (Ideal Me) - Normal (Public Me)			
	2.4820	3.6901	<.001

FIGURE 7.

Mean Potency Scores from the Semantic Differential as a Function of the Interaction of Gender, Weight, Cue, and Repetition.

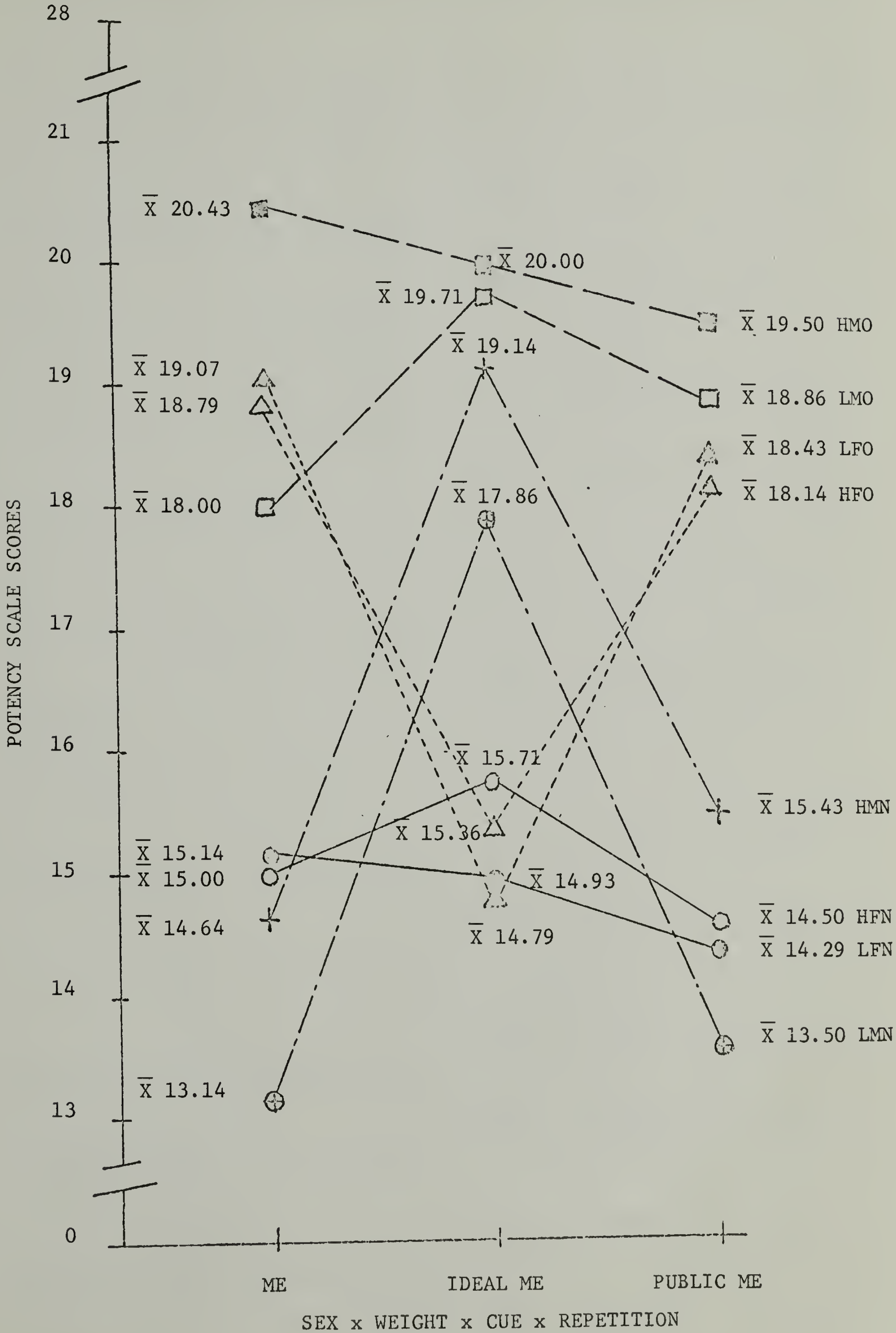


TABLE 13.

Potency Scores: The Results of One Tail t-Tests (df=26) on the Difference between the Means for Male Obese Subjects and Female Obese Subjects.

ME	$\bar{X}_1-\bar{X}_2$	t	P
High Male Obese - High Female Obese			
	1.6400	1.5352	(<.10)
High Male Obese - Low Female Obese			
	1.3600	1.1088	(<.15)
Low Male Obese - High Female Obese			
	-0.7900	-0.63779	n.s.
Low Male Obese - Low Female Obese			
	-1.0700	-0.7768	n.s.
High Male Obese - Low Male Obese			
	2.4300	1.7451	<.05
High Female Obese - Low Female Obese			
	-0.2800	-0.2670	n.s.

IDEAL ME	$\bar{X}_1-\bar{X}_2$	t	P
High Male Obese - High Female Obese			
	4.6400	5.0473	<.0005
High Male Obese - Low Female Obese			
	5.2100	5.1259	<.0005
Low Male Obese - High Female Obese			
	4.3500	4.8381	<.0005
Low Male Obese - Low Female Obese			
	4.9200	4.9288	<.0005
High Male Obese - Low Male Obese			
	0.2900	0.3883	n.s.
High Female Obese - Low Female Obese			
	0.5700	0.5700	n.s.

Table 13 continued on next page.

TABLE 13. (continued)

PUBLIC ME	$\overline{X}_1-\overline{X}_2$	t	P
High Male Obese - High Female Obese			
	1.3600	1.0154	(<.15)
High Male Obese - Low Female Obese			
	1.0700	0.8036	n.s.
Low Male Obese - High Female Obese			
	0.7200	0.5507	n.s.
Low Male Obese - Low Female Obese			
	0.4300	0.3309	n.s.
High Male Obese - Low Male Obese			
	0.6400	0.5145	n.s.
High Female Obese - Low Female Obese			
	-0.2900	-0.2085	n.s.

TABLE 14.

Potency Scores: The Results of One Tail t-Tests (df=26) on the Difference between the Means for Normal Weight Males and Normal Weight Females.

ME	$\bar{X}_1-\bar{X}_2$	t	P
High Male Normal - High Female Normal			
	-0.3600	-0.3685	n.s.
Low Male Normal - Low Female Normal			
	-2.0000	-1.3399	(<.10)
High Male Normal - Low Male Normal			
	1.5000	1.6258	(<.10)
High Female Normal - Low Female Normal			
	-0.1400	-0.0917	n.s.
Low Male Normal - High Female Normal			
	-1.8600	-1.6983	(<.10)
High Male Normal - Low Female Normal			
	-0.5000	-0.3550	n.s.
IDEAL ME			
High Male Normal - High Female Normal			
	3.4300	3.1730	<.005
Low Male Normal - Low Female Normal			
	2.9300	1.9625	<.05
High Male Normal - Low Male Normal			
	1.2800	0.9050	n.s.
High Female Normal - Low Female Normal			
	0.7800	0.6600	n.s.
Low Male Normal - High Female Normal			
	2.1500	1.5263	(<.10)

Table 14 continued on next page.

TABLE 14. (continued)

IDEAL ME, cont.	$\overline{X}_1-\overline{X}_2$	t	P
High Male Normal - Low Female Normal			
	4.2100	3.5411	<.005
PUBLIC ME			
High Male Normal - High Female Normal			
	0.9300	0.6579	n.s.
Low Male Normal - Low Female Normal			
	-0.7900	-0.5814	n.s.
High Male Normal - Low Male Normal			
	1.9300	1.4545	(<.10)
High Female Normal - Low Female Normal			
	0.2100	0.1455	n.s.
Low Male Normal - High Female Normal			
	-1.0000	-0.6987	n.s.
High Male Normal - Low Female Normal			
	1.1400	0.8506	n.s.

TABLE 15.

Analysis of Variance of Activity Scores from Semantic Differential.

Source	df	MS	F	P
Sex	1	3.86	0.22	n.s.
Weight	1	25.19	1.44	n.s.
Cue	1	5.25	0.30	n.s.
Repetition	2	582.95	33.27	$<$.001
Sex x Weight	1	8.05	0.46	n.s.
Sex x Cue	1	10.01	0.57	n.s.
Weight x Cue	1	38.68	2.21	n.s.
Sex x Repetition	2	1.78	0.10	n.s.
Weight x Repetition	2	1.57	0.09	n.s.
Cue x Repetition	2	1.31	0.07	n.s.
Sex x Weight x Cue	1	20.01	1.14	n.s.
Sex x Weight x Repetition	2	13.81	0.79	n.s.
Weight x Cue x Repetition	2	1.62	0.09	n.s.
Error (S/XWC)	104	17.52		
Sex x Weight x Cue x Repetition	2	3.97	0.87	n.s.
Error (SR/XWC)	208	4.55		

TABLE 16.

Cell Means and Standard Deviations of the Analysis of Variance of Activity Scores from the Semantic Differential.

Source		Means (Standard Deviations)		
Sex		Female	Male	
		20.92	20.70	
Weight		Obese	Normal	
		21.08	20.54	
Cue		High	Low	
		20.93	20.68	
Repetition		Me	Ideal Me	Public Me
		19.92	23.40	19.11
Sex x Weight		Obese	Normal	
	Female	21.35	20.49	
	Male	20.82	20.58	
Sex x Cue		High	Low	
	Female	21.21	20.62	
	Male	20.65	20.75	
Weight x Cue		High	Low	
	Obese	21.55	20.62	
	Normal	20.32	20.75	
Sex x Repetition		Me	Ideal Me	Public Me
	Female	20.16	23.39	19.20
	Male	19.68	23.41	19.02
Weight x Repetition		Me	Ideal Me	Public Me
	Obese	20.13	23.61	19.52
	Normal	19.71	23.20	18.70

Table 16 continued on next page.

TABLE 16. (continued)

Source		Means (Standard Deviations)		
Cue x Repetition		Me	Ideal Me	Public Me
	High	20.14	23.41	19.25
	Low	19.70	23.39	18.96
Sex x Weight x Cue		Female		
		High	Low	
	Obese	21.74	20.95	
	Normal	20.69	20.29	
		Male		
	Obese	21.36	20.29	
	Normal	19.95	21.21	
Sex x Weight x Repetition		Female		
		Me	Ideal Me	Public Me
	Obese	20.64	23.36	20.04
	Normal	19.68	23.43	18.36
		Male		
	Obese	19.61	23.86	19.00
	Normal	19.75	22.96	19.04
Sex x Cue x Repetition		Female		
		Me	Ideal Me	Public Me
	High	20.71	23.57	19.36
	Low	19.61	23.21	19.04
		Male		
	High	19.57	23.25	19.14
	Low	19.79	23.57	18.89

Table 16 continued on next page.

TABLE 16. (continued)

Source		Means (Standard Deviations)		
Weight x Cue x Repetition			Obese	
		Me	Ideal Me	Public Me
	High	20.79	23.82	20.04
	Low	19.46	23.39	19.00
			Normal	
	High	19.50	23.00	18.46
	Low	19.93	23.39	18.93
Sex x Weight x Cue x Repetition			Female Obese	
		Me	Ideal Me	Public Me
	High	21.29 (2.46)	23.71 (2.05)	20.21 (2.42)
	Low	20.00 (1.77)	23.00 (1.65)	19.86 (2.20)
			Female Normal	
	High	20.14 (3.31)	23.43 (1.72)	18.50 (3.44)
	Low	19.21 (4.09)	23.43 (1.84)	18.21 (3.80)
			Male Obese	
	High	20.29 (3.10)	23.93 (2.02)	19.86 (3.52)
	Low	18.93 (2.09)	23.79 (1.86)	18.14 (3.48)
			Male Normal	
	High	18.86 (4.09)	22.57 (2.06)	18.43 (4.42)
	Low	20.64 (2.92)	23.36 (1.49)	19.64 (3.77)

FIGURE 8.

Mean Activity Scores from the Semantic Differential as a Function of the Interaction of Gender, Weight, Cue, and Repetition.

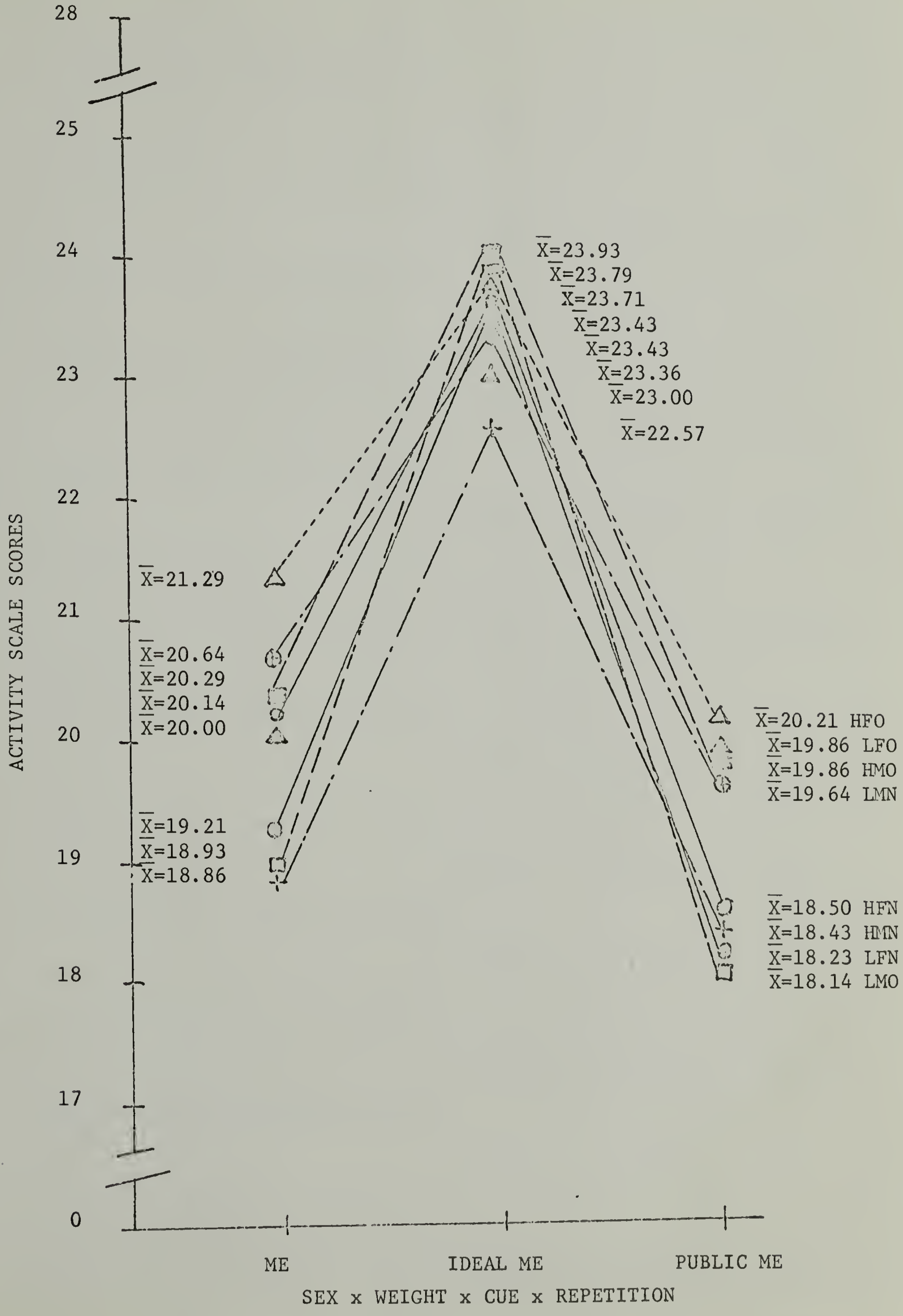


TABLE 17.

Activity Scores: The Results of One Tail t-Tests (df=26) on the Difference between the Means for Male Obese Subjects and Female Obese Subjects.

ME	$\bar{X}_1-\bar{X}_2$	t	P
High Male Obese - High Female Obese			
	-1.0000	-0.9466	n.s.
High Male Obese - Low Female Obese			
	0.2900	0.3040	n.s.
Low Male Obese - High Female Obese			
	-2.3600	-2.7359	<.01
Low Male Obese - Low Female Obese			
	-1.0700	-1.4619	(<.10)
High Male Obese - Low Male Obese			
	1.3600	1.3612	(<.10)
High Female Obese - Low Female Obese			
	1.2900	1.5929	(<.10)
IDEAL ME			
High Male Obese - High Female Obese			
	0.2200	0.2860	n.s.
High Male Obese - Low Female Obese			
	0.9300	1.3344	(<.10)
Low Male Obese - High Female Obese			
	0.0800	0.1081	n.s.
Low Male Obese - Low Female Obese			
	0.7900	1.1890	(<.15)
High Male Obese - Low Male Obese			
	0.1400	0.1907	n.s.
High Female Obese - Low Female Obese			
	0.7100	1.6063	(<.10)

Table 17 continued on next page.

TABLE 17. (continued)

PUBLIC ME	$\bar{X}_1-\bar{X}_2$	t	P
High Male Obese - High Female Obese			
	-0.3500	-0.3065	n.s.
High Male Obese - Low Female Obese			
	0.0000	0.0000	n.s.
Low Male Obese - High Female Obese			
	-2.0700	-1.8273	$<.05$
Low Male Obese - Low Female Obese			
	-1.7200	-1.5632	($<.10$)
High Male Obese - Low Male Obese			
	1.7200	1.3002	($<.15$)
High Female Obese - Low Female Obese			
	0.3500	0.4004	n.s.

TABLE 18.

Activity Scores: The Results of One Tail t-Tests (df=26) on the Difference between the Means for Normal Weight Males and Normal Weight Females.

ME	$\overline{X}_1-\overline{X}_2$	t	P
High Male Normal - High Female Normal			
	-1.2800	-0.9103	n.s.
Low Male Normal - Low Female Normal			
	1.4300	1.0647	($<$.15)
High Male Normal - Low Male Normal			
	-1.7800	-1.3253	($<$.10)
High Female Normal - Low Female Normal			
	0.9300	0.6614	n.s.
Low Male Normal - High Female Normal			
	0.5000	0.8477	n.s.
High Male Normal - Low Female Normal			
	-0.3500	-0.2262	n.s.
IDEAL ME			
High Male Normal - High Female Normal			
	-0.8600	-1.1991	($<$.15)
Low Male Normal - Low Female Normal			
	-0.0700	-0.9220	n.s.
High Male Normal - Low Male Normal			
	-0.7900	-1.1627	($<$.15)
High Female Normal - Low Female Normal			
	0.0000	0.0000	n.s.
Low Male Normal - High Female Normal			
	-0.0700	-0.1151	n.s.
High Male Normal - Low Female Normal			
	-0.8600	-1.1650	($<$.15)

Table 18 continued on next page.

TABLE 18. (continued)

PUBLIC ME	$\bar{X}_1 - \bar{X}_2$	t	P
High Male Normal - High Female Normal			
	-0.0700	-0.0467	n.s.
Low Male Normal - Low Female Normal			
	1.4300	0.9996	n.s.
High Male Normal - Low Male Normal			
	-1.2100	-0.7793	n.s.
High Female Normal - Low Female Normal			
	0.2900	0.2117	n.s.
Low Male Normal - High Female Normal			
	1.1400	0.8358	n.s.
High Male Normal - Low Female Normal			
	0.2200	0.1412	n.s.

TABLE 19.

Analysis of Variance of Total Scores from the Semantic Differential.

Source	df	MS	F	P
Sex	1	77.15	1.26	n.s.
Weight	1	1332.03	21.81	<.001
Cue	1	28.00	0.46	n.s.
Repetition	2	1786.22	103.80	<.001
Sex x Weight	1	3.24	0.05	n.s.
Sex x Cue	1	48.00	0.79	n.s.
Weight x Cue	1	39.36	0.64	n.s.
Sex x Repetition	2	154.02	8.95	<.001
Weight x Repetition	2	186.76	10.85	<.001
Cue x Repetition	2	1.11	0.06	n.s.
Sex x Weight x Cue	1	0.00	0.00	n.s.
Sex x Weight x Repetition	2	22.78	1.32	n.s.
Sex x Cue x Repetition	2	7.91	0.46	n.s.
Weight x Cue x Repetition	2	18.38	1.07	n.s.
Error (S/XWC)	104	61.07		
Sex x Weight x Cue x Repetition	2	10.67	0.61	n.s.
Error (SR/XWC)	208	17.21		

TABLE 20.

Cell Means and Standard Deviations of the Analysis of Variance of Total Scores from the Semantic Differential.

Source		Means (Standard Deviations)		
Sex		Female	Male	
		61.59	62.55	
Weight		Obese	Normal	
		64.06	60.08	
Cue		High	Low	
		62.36	61.78	
Repetition		Me	Ideal Me	Public Me
		60.29	66.64	59.28
Sex x Weight		Obese	Normal	
	Female	63.68	59.50	
	Male	64.44	60.65	
Sex x Cue		High	Low	
	Female	61.50	61.68	
	Male	63.21	61.88	
Weight x Cue		High	Low	
	Obese	64.69	63.43	
	Normal	60.02	60.13	
Sex x Repetition		Me	Ideal Me	Public Me
	Female	60.77	64.86	59.14
	Male	59.80	68.43	59.41
Weight x Repetition		Me	Ideal Me	Public Me
	Obese	63.02	67.14	62.02
	Normal	57.55	66.14	56.54

Table 20 continued on next page.

TABLE 20. (continued)

Source		Means (Standard Deviations)		
Cue x Repetition		Me	Ideal Me	Public Me
	High	60.54	66.86	59.68
	Low	60.04	66.43	58.88
Sex x Weight x Cue		Female		
		High	Low	
	Obese	63.93	63.43	
	Normal	59.07	59.93	
		Male		
	Obese	65.45	63.43	
	Normal	60.98	60.33	
Sex x Weight x Repetition			Female	
		Me	Ideal Me	Public Me
	Obese	63.61	65.00	62.43
	Normal	57.93	64.71	55.86
			Male	
	Obese	62.43	69.29	61.61
	Normal	57.18	67.57	57.21
Sex x Cue x Repetition			Female	
		Me	Ideal Me	Public Me
	High	60.50	65.00	59.00
	Low	61.04	64.71	59.29
			Male	
	High	60.57	68.71	60.36
	Low	59.04	68.14	58.46

Table 20 continued on next page.

TABLE 20. (continued)

Source		Means (Standard Deviations)		
Weight x Cue x Repetition			Obese	
		Me	Ideal Me	Public Me
	High	64.07	67.54	62.46
	Low	61.96	66.75	61.57
			Normal	
	High	57.00	66.18	56.89
	Low	58.11	66.11	56.18
Sex x Weight x Cue x Repetition			Female Obese	
		Me	Ideal Me	Public Me
	High	63.86 (5.33)	65.64 (4.62)	62.29 (5.91)
	Low	63.36 (4.03)	64.36 (3.56)	62.57 (4.14)
			Female Normal	
	High	57.14 (4.76)	64.36 (2.99)	55.71 (6.02)
	Low	58.71 (7.00)	65.07 (4.94)	56.00 (6.58)
			Male Obese	
	High	64.29 (6.15)	69.43 (4.35)	62.64 (6.32)
	Low	60.57 (4.10)	69.14 (4.14)	60.57 (5.89)
			Male Normal	
	High	56.86 (6.59)	68.00 (3.40)	58.07 (7.30)
	Low	57.50 (5.97)	67.14 (4.94)	56.36 (7.77)

FIGURE 9.

Mean Total Semantic Differential Scores as a Function of Weight.

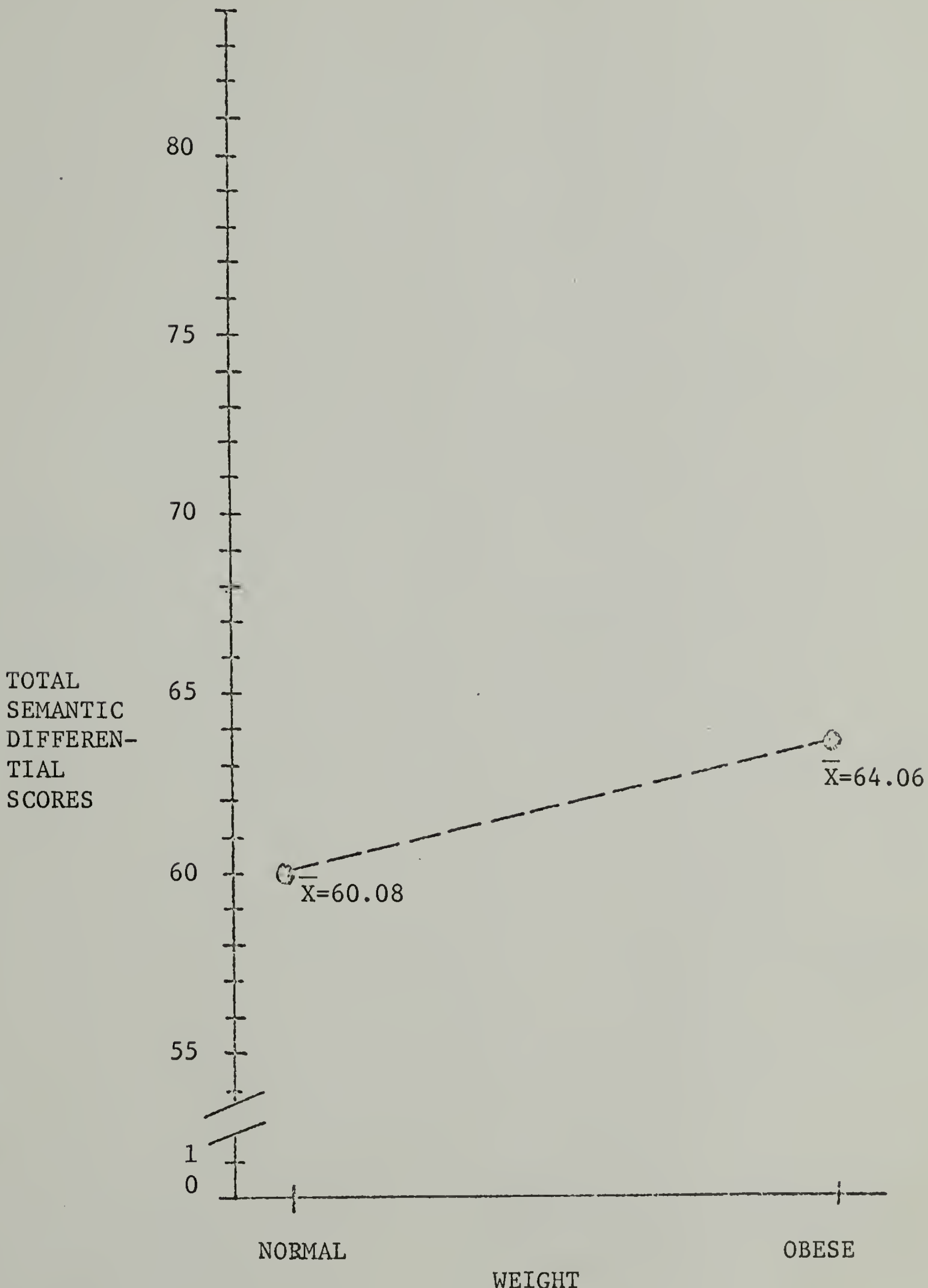


FIGURE 10.

Mean Total Semantic Differential Scores as a Function of the Interaction of Weight and Repetition.

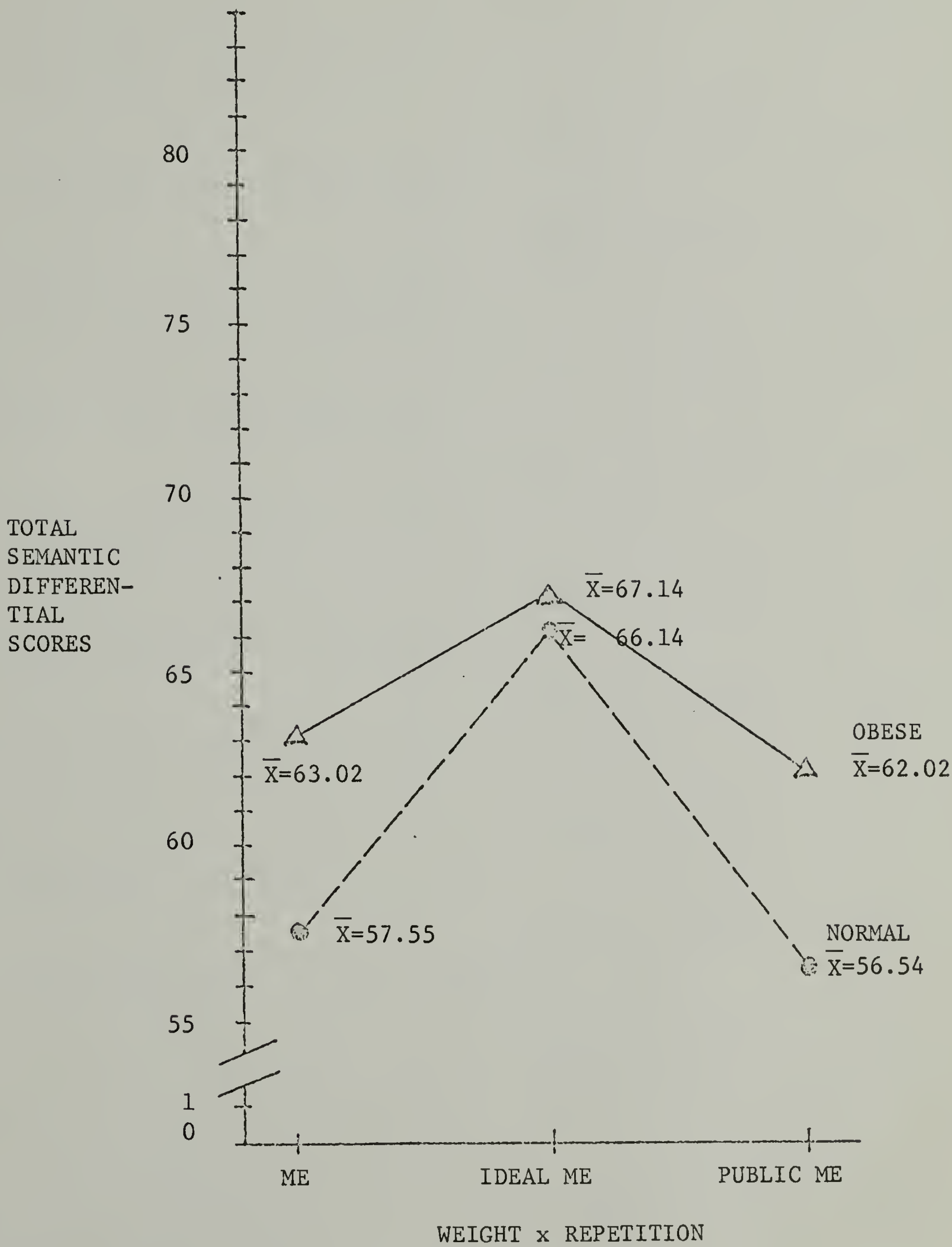


TABLE 21.

Semantic Differential Total Scores as a Function of the Interaction of Weight and Repetition: The Results of One Tail t-Tests (df=104) on the Difference between the Means.

	$\bar{X}_1-\bar{X}_2$	t	P
Obese (Me) - Normal (Me)			
	5.4642	5.1631	<.001
Obese (Ideal Me) - Normal (Ideal Me)			
	1.0003	1.2682	n.s.
Obese (Public Me) - Normal (Public Me)			
	5.4822	4.5845	<.001
Obese (Me) - Obese (Ideal Me)			
	-4.1253	-4.7449	<.001
Obese (Me) - Obese (Public Me)			
	1.0000	0.8737	n.s.
Obese (Ideal Me) - Obese (Public Me)			
	5.1253	4.7185	<.001
Normal (Me) - Normal (Ideal Me)			
	-8.5892	-8.6645	<.001
Normal (Me) - Normal (Public Me)			
	1.0180	0.8203	n.s.
Normal (Ideal Me) - Normal (Public Me)			
	9.6072	8.8815	<.001

FIGURE 11.

Mean Total Semantic Differential Scores as a Function of the Interaction of Gender, Weight, Cue, and Repetition.

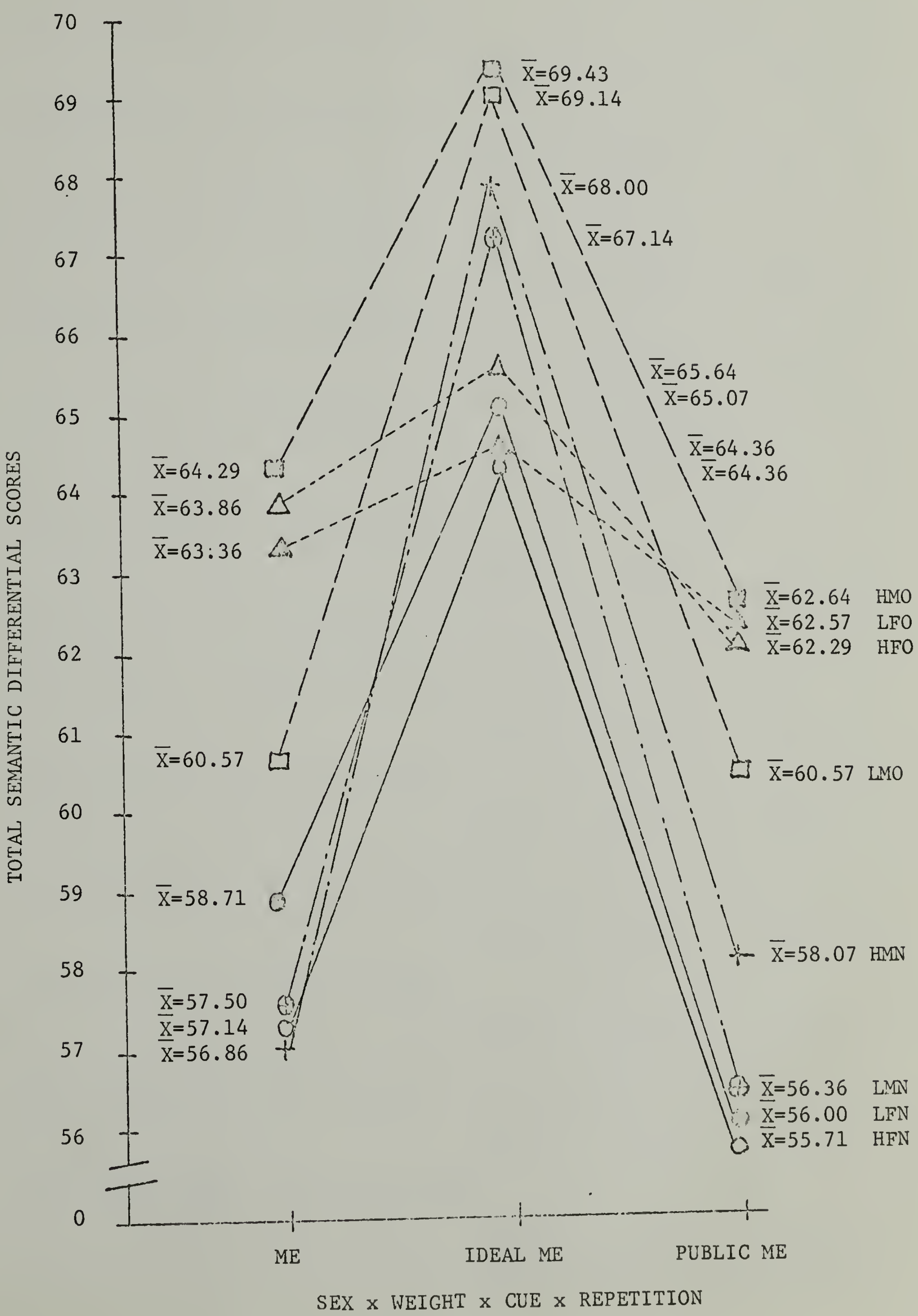


TABLE 22.

Total Scores: The Results of One Tail t-Tests (df=26) on the Difference between the Means for Male Obese Subjects and Female Obese Subjects.

	$\bar{X}_1-\bar{X}_2$	t	P
ME			
High Male Obese - High Female Obese	0.4300	0.1977	n.s.
High Male Obese - Low Female Obese	0.9300	0.4732	n.s.
Low Male Obese - High Female Obese	-3.2900	-1.8307	<.05
Low Male Obese - Low Female Obese	-2.7900	-1.8159	<.05
High Male Obese - Low Male Obese	3.7200	1.8831	<.05
High Female Obese - Low Female Obese	0.5000	0.2799	n.s.
IDEAL ME			
High Male Obese - High Female Obese	3.7900	2.2348	<.025
High Male Obese - Low Female Obese	5.0700	3.3750	<.005
Low Male Obese - High Female Obese	3.5000	2.1111	<.025
Low Male Obese - Low Female Obese	4.7800	3.2757	<.005
High Male Obese - Low Male Obese	0.2900	0.1806	n.s.
High Female Obese - Low Female Obese	1.2800	0.8211	n.s.

Table 22 continued on next page.

TABLE 22. (continued)

PUBLIC ME	$\overline{X}_1-\overline{X}_2$	t	P
High Male Obese - High Female Obese			
	0.3500	0.1513	n.s.
High Male Obese - Low Female Obese			
	0.0700	0.0346	n.s.
Low Male Obese - High Female Obese			
	-1.7200	-0.7713	n.s.
Low Male Obese - Low Female Obese			
	-2.0000	-1.0394	n.s.
High Male Obese - Low Male Obese			
	2.0700	0.8965	n.s.
High Female Obese - Low Female Obese			
	-0.2800	-0.1451	n.s.

TABLE 23.

Total Scores: The Results of One Tail t-Tests (df=26) on the Difference between the Means for Normal Weight Males and Normal Weight Females.

ME	$\bar{X}_1-\bar{X}_2$	t	P
High Male Normal - High Female Normal	-0.2800	-0.1288	n.s.
Low Male Normal - Low Female Normal	0.3600	0.1764	n.s.
High Male Normal - Low Male Normal	-0.6400	-0.2693	n.s.
High Female Normal - Low Female Normal	-1.5700	-0.6939	n.s.
Low Male Normal - High Female Normal	0.3600	0.1764	n.s.
High Male Normal - Low Female Normal	-0.2800	0.1288	n.s.
IDEAL ME			
High Male Normal - High Female Normal	3.6400	3.0082	$<.005$
Low Male Normal - Low Female Normal	2.7800	1.8014	$<.05$
High Male Normal - Low Male Normal	0.8600	0.5365	n.s.
High Female Normal - Low Female Normal	-0.7100	-0.4600	n.s.
Low Male Normal - High Female Normal	2.7800	1.8014	$<.05$
High Male Normal - Low Female Normal	3.6400	3.0082	$<.005$

Table 23 continued on next page.

TABLE 23. (continued)

PUBLIC ME	$\bar{X}_1-\bar{X}_2$	t	P
High Male Normal - High Female Normal			
	2.3600	0.9332	n.s.
Low Male Normal - Low Female Normal			
	0.6500	0.2474	n.s.
High Male Normal - Low Male Normal			
	1.7100	0.6001	n.s.
High Female Normal - Low Female Normal			
	-0.2900	-0.1216	n.s.
Low Male Normal - High Female Normal			
	0.6500	0.2474	n.s.
High Male Normal - Low Female Normal			
	2.0700	0.7881	n.s.

Statistical Analysis Using Anxiety and Depression Scores.

Hypothesis 4.

Hypothesis 4 predicted "the obese will report less anxiety and depression than the nonobese will report." When the anxiety scale scores were analyzed, the sex x weight interaction effect proved to be significant at less than the .05 level (tables 24 and 25; figure 12). As table 26 shows, there was no significant difference in reporting anxiety between normal and obese males, but the obese females reported significantly less ($p < .025$) anxiety than did the normal weight females. Thus, the hypothesis was supported by the female anxiety scale data but not by the equivalent male anxiety data.

The depression scale data analysis (tables 27 and 28) provided support for the fourth hypothesis. Weight proved to be a significant main effect (figure 14) with the obese reporting significantly less ($p < .01$) depression than the normal weight subjects. There was also a sex main effect (figure 13) with the pooled males reporting significantly less ($p < .05$) depression than pooled females.

Pooling of both anxiety and depression scale scores resulted in a significant ($p < .05$) sex x weight x cue interaction effect (tables 29 and 30; figure 15). Although this effect was not predicted, it appeared to be closely associated with the overt eating behavior of the obese females. The level of combined anxiety and depression reported by males did not differ as a function of weight or food cue prominence (table 31). The same table shows that while low and high cue normal weight females reported higher levels of combined anxiety and depression than the low cue obese females and any of the four male groups, the low and the high cue normal female groups did not differ significantly from each other. The obese females did differ significantly as a

function of cue level in how much combined anxiety and depression they reported. The difference between the low and high cue obese females was significant at less than the .025 level. In the low cue condition <u>where their eating was limited but where they tended to eat most of what was available</u>, the obese females reported <u>less</u> negative effect than the other three low cue groups. The latter difference was significant in two cases: 1) between the low cue female obese group and the low cue normal female group ($p < .01$); and 2) between the low cue obese female group and the low cue male obese group ($p < .05$). In the high cue condition, <u>after having "gone on a crash diet"</u> in response to all the food available, the obese females reported a significantly <u>higher</u> level of combined anxiety and depression. Whereas the difference in the low cue condition between normal females and obese females had been significant at less than the .01 level, because of the increase in reported effect the difference in the high cue condition between the two groups of females became insignificant.

TABLE 24.

Analysis of Variance of Anxiety Scores.

Source	df	MS	F	P
Sex	1	0.57	0.03	n.s.
Weight	1	11.57	0.65	n.s.
Cue	1	7.00	0.39	n.s.
Sex x Weight	1	78.89	4.40	$<.05$
Sex x Cue	1	1.75	0.10	n.s.
Weight x Cue	1	34.32	1.91	n.s.
Sex x Weight x Cue	1	46.29	2.58	n.s.
Error (S/XWC)	104	17.94		

TABLE 25.

Cell Means and Standard Deviations of the Analysis of Variance of Anxiety Scores.

Source		Means (Standard Deviations)	
Sex		Female	Male
		8.66	8.80
Weight		Obese	Normal
		8.41	9.05
Cue		High	Low
		8.48	8.98
Sex x Weight		Obese	Normal
	Female	7.50	9.82
	Male	9.32	8.29
Sex x Cue		High	Low
	Female	8.54	8.79
	Male	8.43	9.18
Weight x Cue		High	Low
	Obese	8.71	8.11
	Normal	8.25	9.86
Sex x Weight x Cue		Female	
		High	Low
	Obese	8.57 (4.29)	6.43 (3.40)
	Normal	8.50 (3.74)	11.14 (5.62)
		Male	
	Obese	8.86 (3.52)	9.79 (3.41)
	Normal	8.00 (4.47)	8.57 (3.72)

FIGURE 12.

Mean Anxiety Scale Scores as a Function of the Interaction of Gender and Weight.

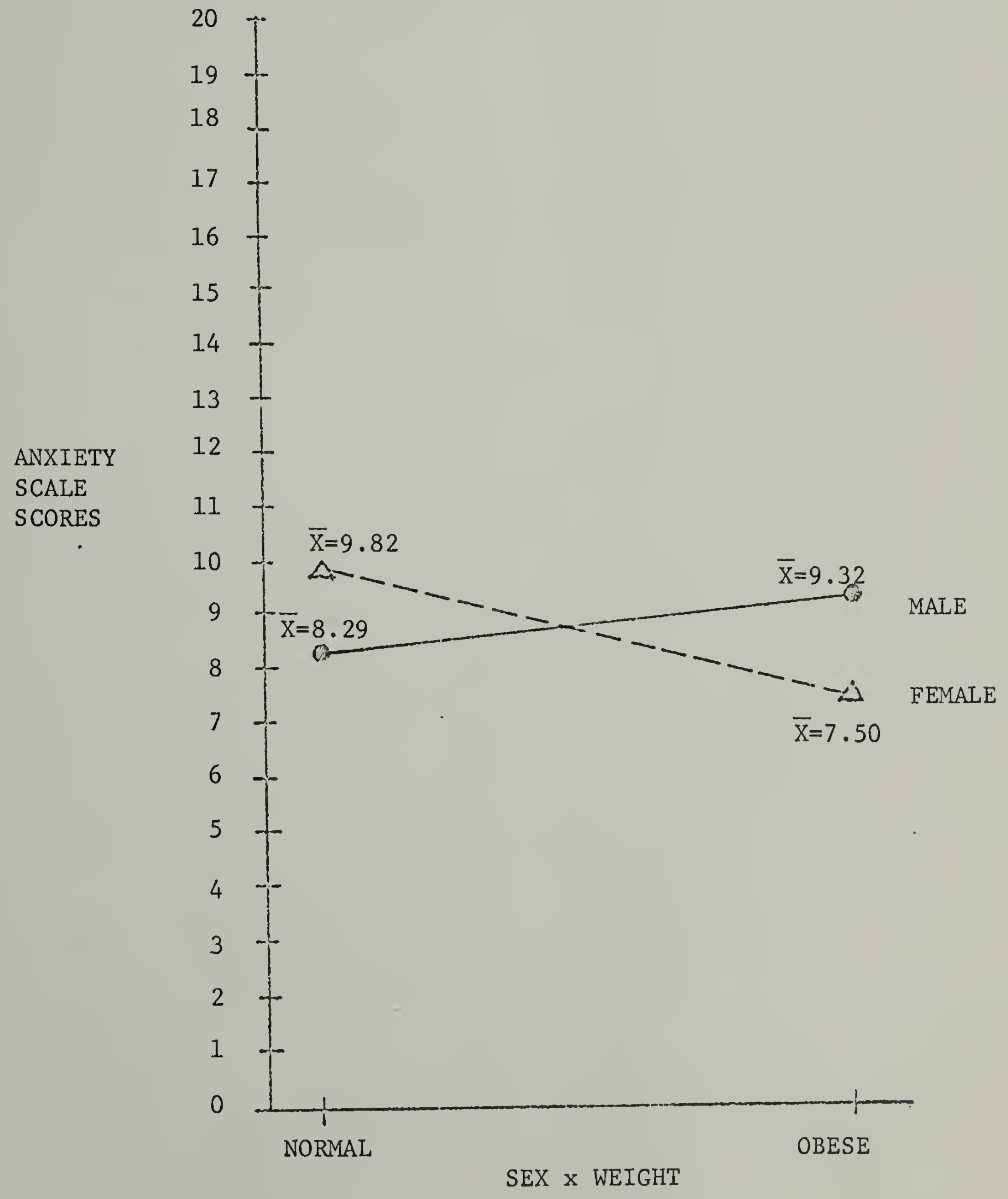


TABLE 26.

Anxiety Scale Scores as a Function of the Interaction of Gender and Weight: The Results of One Tail t-Tests (df=54) on the Difference between the Means.

	$\bar{X}_1-\bar{X}_2$	t	P
Female Normal - Female Obese	2.3215	1.9980	$<.025$
Male Normal - Male Obese	-1.0360	-1.0207	n.s.
Female Normal - Male Normal	1.5360	1.2890	$(<.10)$
Female Obese - Male Obese	-1.8215	-1.8560	$<.05$

TABLE 27.

Analysis of Variance of Depression Scores.

Source	df	MS	F	P
Sex	1	29.01	4.44	<.05
Weight	1	52.94	8.10	<.01
Cue	1	1.51	0.23	n.s.
Sex x Weight	1	2.58	0.39	n.s.
Sex x Cue	1	0.72	0.11	n.s.
Weight x Cue	1	0.08	0.01	n.s.
Sex x Weight x Cue	1	10.94	1.67	n.s.
Error (S/XWC)	104	6.54		

TABLE 28.

Cell Means and Standard Deviations of the Analysis of Variance of Depression Scores.

Source		Means (Standard Deviations)	
Sex		Female	Male
		11.95	10.93
Weight		Obese	Normal
		10.75	12.13
Cue		High	Low
		11.55	11.32
Sex x Weight		Obese	Normal
	Female	11.11	12.79
	Male	10.39	11.46
Sex x Cue		High	Low
	Female	12.14	11.75
	Male	10.96	10.89
Weight x Cue		High	Low
	Obese	10.89	10.61
	Normal	12.21	12.04
Sex x Weight x Cue		Female	
		High	Low
	Obese	11.64 (2.38)	10.57 (1.76)
	Normal	12.64 (2.47)	12.93 (3.10)
		Male	
	Obese	10.14 (2.26)	10.64 (2.87)
	Normal	11.79 (2.18)	11.14 (2.45)

FIGURE 13.

Mean Depression Scale Scores as a Function of Gender.

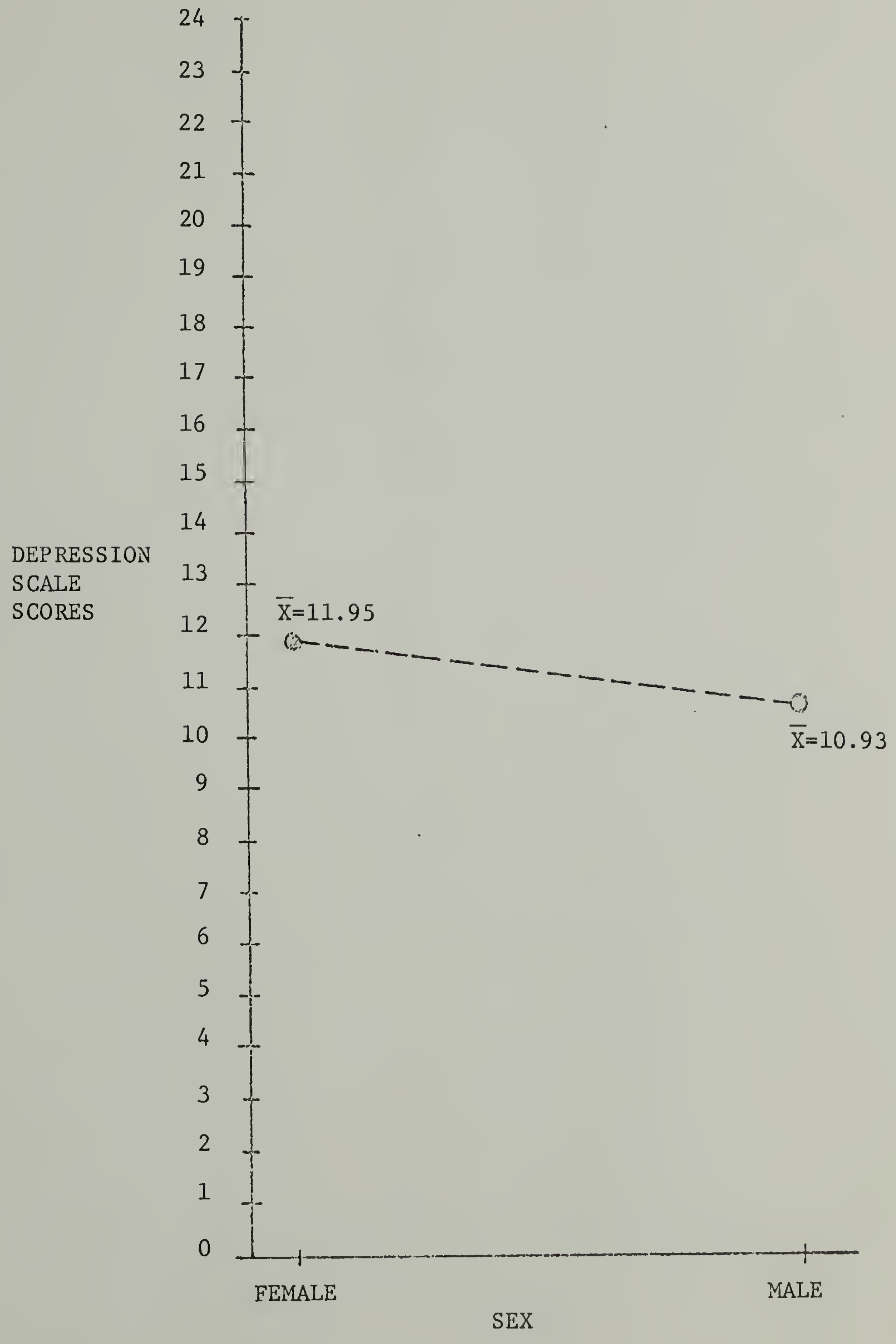


FIGURE 14.

Mean Depression Scale Scores as a Function of Weight.

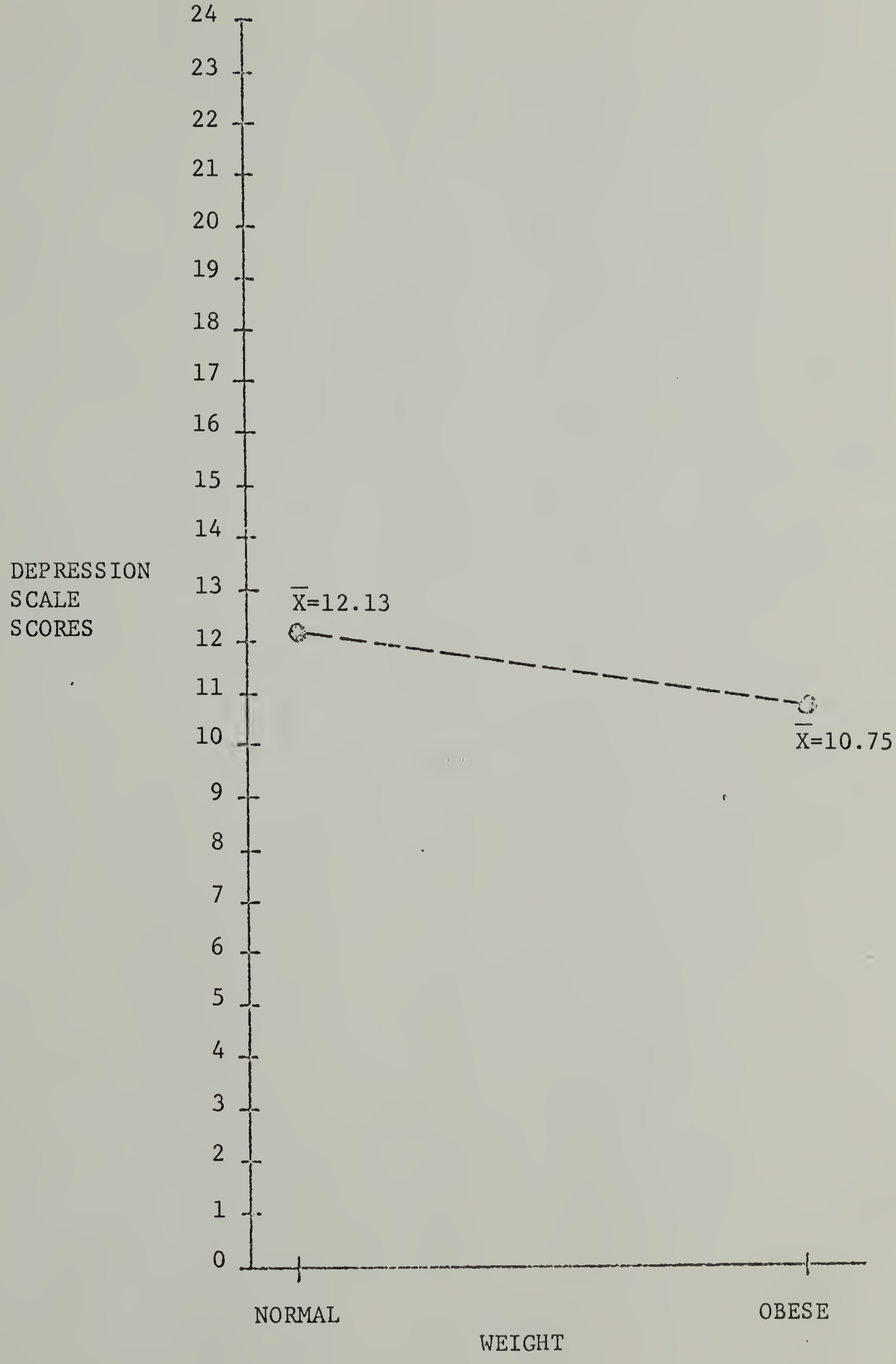


TABLE 29.

Analysis of Variance of Summed Anxiety and Depression Scores.

Source	df	MS	F	P
Sex	1	35.44	1.13	n.s.
Weight	1	87.51	2.79	n.s.
Cue	1	0.01	0.00	n.s.
Sex x Weight	1	84.01	2.68	n.s.
Sex x Cue	1	12.22	0.39	n.s.
Weight x Cue	1	55.72	1.79	n.s.
Sex x Weight x Cue	1	130.72	4.17	$<.05$
Error (S/XWC)	104	31.32		

TABLE 30.

Cell Means and Standard Deviations of the Analysis of Variance of Summed Anxiety and Depression Scores.

Source		Means (Standard Deviations)	
Sex		Female	Male
		20.86	19.73
Weight		Obese	Normal
		19.41	21.18
Cue		High	Low
		20.29	20.30
Sex x Weight		Obese	Normal
	Female	19.11	22.61
	Male	19.71	19.75
Sex x Cue		High	Low
	Female	21.18	20.54
	Male	19.39	20.07
Weight x Cue		High	Low
	Obese	20.11	18.71
	Normal	20.46	21.89
Sex x Weight x Cue		Female	
		High	Low
	Obese	21.21 (5.31)	17.00 (3.78)
	Normal	21.14 (4.98)	24.07 (7.47)
		Male	
	Obese	19.00 (5.18)	20.43 (5.22)
	Normal	19.79 (5.23)	19.71 (5.31)

FIGURE 15.

Mean Summed Anxiety and Depression Scale Scores as a Function of the Interaction of Gender, Weight, and Cue.

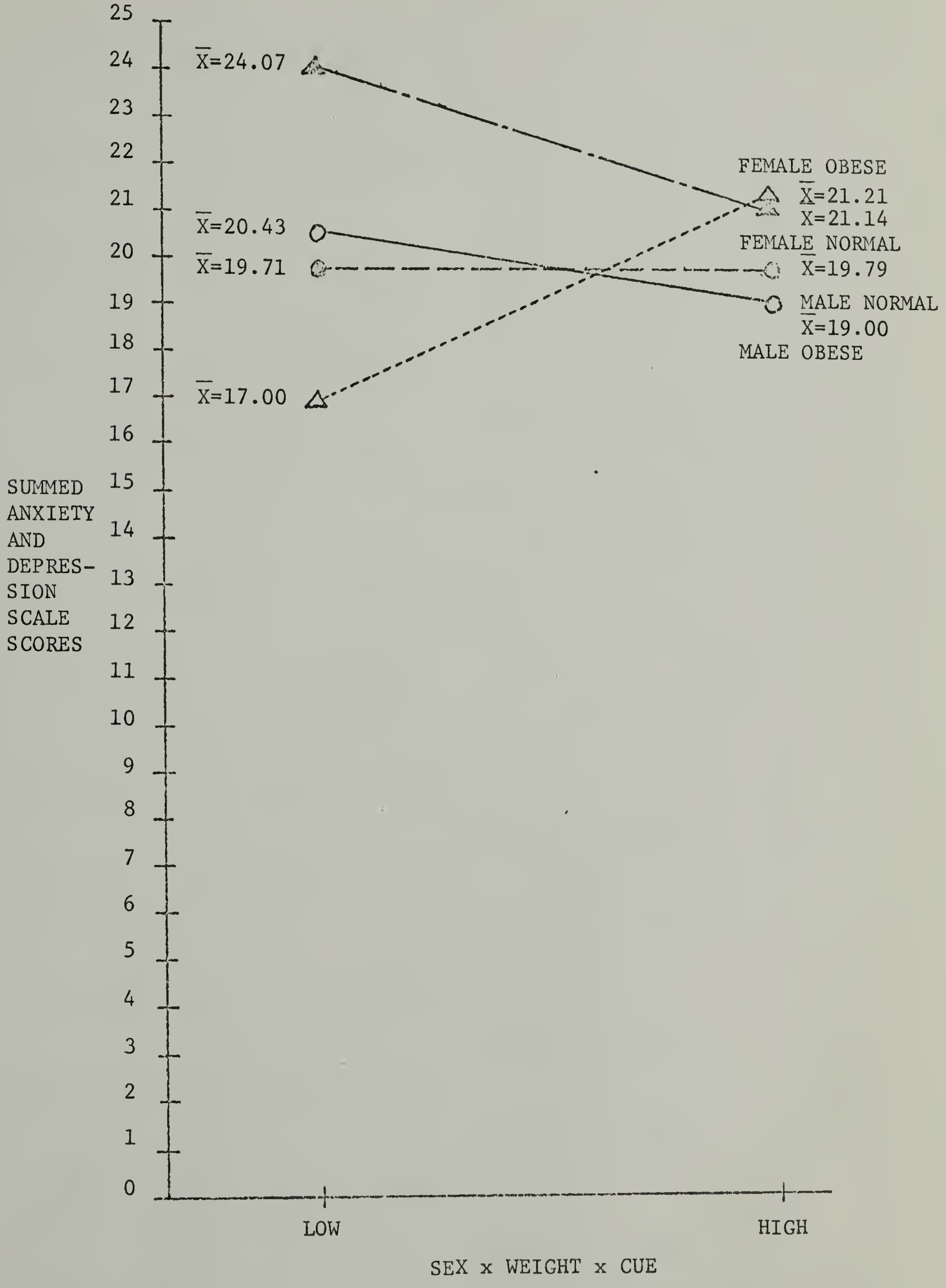


TABLE 31.

Summed Anxiety and Depression Scores as a Function of the Interaction of Gender, Weight, and Cue: The Results of One Tail t-Tests (df=26) on the Difference between the Means.

	$\bar{X}_1 - \bar{X}_2$	t	P
Low Female Normal - High Female Normal			
	2.9280	1.2200	(<.15)
Low Female Obese - High Female Obese			
	-4.2140	-2.4208	<.025
Low Male Obese - High Male Obese			
	1.4290	0.7273	n.s.
Low Male Normal - High Male Normal			
	-0.0720	-0.0361	n.s.
Low Female Normal - Low Female Obese			
	7.0710	3.1622	<.01
High Female Normal - High Female Obese			
	-0.0710	-0.0364	n.s.
Low Male Obese - Low Male Normal			
	0.7150	0.3592	n.s.
High Male Obese - High Male Normal			
	-0.7860	-0.3995	n.s.
High Female Obese - High Male Obese			
	2.2140	1.1168	(<.15)
High Female Normal - High Male Normal			
	1.3570	0.7035	n.s.
Low Female Normal - Low Male Obese			
	3.6400	1.4945	(<.10)
Low Female Normal - Low Male Normal			
	4.3600	1.7800	<.05

Table 31 continued on next page.

TABLE 31. (continued)

	$\bar{X}_1-\bar{X}_2$	t	P
Low Male Obese - Low Female Obese			
	3.4300	1.9913	$<.05$
Low Male Normal - Low Female Obese			
	2.7100	1.2112	$(<.15)$

DISCUSSION

Four questions were addressed by this study. First, was it possible to replicate the findings of Schachter and his associates when the results of the consumatory responses to external, food-related stimuli of both females and males were pooled? Second, if not, then how did the behavior of the females differ from that of the males? Third, did the self-concepts of males and females differ as a function of body weight? And fourth, did the obese differ significantly from normals in their self-reports of anxiety and depression?

An implicit assumption underlying Schachter's hypothesis is that all obese individuals tend to react in a similar fashion to the environmental cues associated with food. However, his position was extrapolated from data derived only from male subjects and recent studies (Schwabacher, 1973; Prescott and Foster, 1973), having found an overuse of male subjects in the development and testing of psychological theories and models, contend that the results of studies done on women have not always supported current psychological theories about human nature. This study, which used both male and female subjects, tends to support such a position since its results cast considerable doubt upon the validity of Schachter's assumption. The data analysis indicated that under certain conditions the consumatory behavior of the obese differed, in part, as a function of the overweight group's gender. The analysis also suggests that these behavioral differences were mediated by differences in self-concept.

Two dependent variables were used to measure consumatory behavior: 1) weight in ounces of total amount of food consumed; and 2) percentage of body weight in total amount of food consumed. The first was used in order to permit comparison of the results of this study to those of Nisbett and the second was utilized to compensate for gender-related differences in body size and thus permit comparison of male and female consumatory behavior. It will be seen that each male group consistently ate more in ounces of food than did its female counterpart group. The explanation for this difference is to be found in the Tables of Average Weights and of Weight Ranges where the average weights and the limits for obesity and normality for women are always less than the respective weights and limits for men of the same age and height. Thus, the male groups required more food in order to maintain an experimentally determined greater weight.

The first hypothesis predicted a replication of Nisbett's 1968b results. The performances of both the normal male and normal female subjects did provide support for the contention that irrespective of cue prominence level, normal weight subjects would eat equal amounts. Although the normals were somewhat responsive to external, food-related stimuli since they ate slightly more in the high prominent condition, this difference was not significant and therefore Schachter's contention was supported that normal weight people, whether male or female, responded primarily to the internal physiological cues associated with hunger. That is, normals ate when they experienced hunger and, irrespective of the external stimulus situation, stopped eating when sated.

On the other hand, the major prediction of the first hypothesis,

that the obese would eat more as the prominence of the external, food-related cues were increased, was not supported. Nisbett had obtained a significant increase in consumption by the obese males as cue prominence increased. In this study, as cue prominence increased, the obese males and obese females behaved in diametrically opposed fashion and therefore, when the effects of gender were not partialled out, there was <u>no significant difference in the consumatory behavior of the obese across level of cue</u>. Furthermore, contrary to Schachter's prediction, when the effects of gender were not considered, the low cue obese ate significantly more in ounces of food than did the low cue normals and there was no significant difference in the amount eaten between the high cue normals and obese.

In sum, when the effect of the <u>Ss</u>' sex was not examined, the first hypothesis was supported by the consumatory behavior of the normals but not by the eating behavior of the obese. The obese males and females did react to changes in external cue prominence, but not always in the directions predicted by Nisbett and Schachter. These differences are best discussed in reference to the second hypothesis.

The second hypothesis was tested using the same two dependent variables which were utilized for the first hypothesis. Results indicated that for normal males and females, within gender, there was no difference across cue level in either weight of food eaten or percentage of body weight consumed. There was, however, a significant difference across gender because the low and high cue normal male groups each ate significantly more ounces of food than did its female counterpart. As discussed above, differences in female and male constitutions and the built-in experimental biases of the Tables of Average Weights and of

Weight Ranges appear to account for this discrepancy between males and females in the actual amount of food consumed. Support for this explanation was provided by the fact that this difference became insignificant when weight in ounces of food eaten was converted to percentage of body weight consumed. Since the percentage data was originally chosen as a dependent variable in order to make female and male consumatory behaviors comparable, the results for the normal males and normal females supported that part of the second hypothesis which stated that in both the high and low prominent conditions, the normal weight females and normal weight males would eat equal amounts of food. This was further experimental support for Schachter's contention that _normal weight individuals_, _irrespective of gender_, _respond primarily to the internal cues associated with hunger and are not unduly influenced by the external cues associated with food_.

The data also supported that part of the second hypothesis which stated that minimization of external, food-related cues would result in obese females and obese males eating equal amounts of food. When the weight in ounces consumed by the low cue obese subjects, separated by gender, was examined, the low cue obese females had eaten significantly less than the low cue obese male group. But again the difference between low cue obese females and males disappeared when the percentage of body weight in food consumed was utilized as the dependent measure. As for that section of the second hypothesis which compared the consumatory behavior of the low cue obese groups with that of the obese in the high cue situation, it will be seen in the discussion of the latter that _the high cue obese males_, _as predicted by Schachter_, _ate significantly more than the obese males in the low_

cue condition while the high cue obese females, contrary to the prediction, ate less than did the low cue obese females.

The obese male performance replicated Nisbett's results, but the obese female behavior did not. The high cue obese males ate significantly more than did the high cue normal males in both weight in ounces and in percentage of body weight. The consumatory behavior of the high cue obese females, on the other hand, resulted in a gender-related difference which was neither predicted nor accounted for by Schachter's and Nisbett's research and hypothesis. Although the high cue obese females consumed less in actual weight in ounces of food than did the low cue obese females, this difference became insignificant when the amounts eaten were converted to percentage of body weight in food consumed. The analysis of percentage of body weight also led to no significant difference between the low cue obese females and the low cue normal females. However, because the high cue normal females increased their percentage and the high cue obese females decreased their percentage, the difference between the two groups became significant in the high cue situation. It was the direction of this difference in consumatory behavior across cue level between obese and normal females, and therefore between obese females and obese males, which was neither predicted by Schachter's hypothesis nor adequately explained by a simple claim that the obese are primarily under the control of external stimuli.

In general, Schachter's hypothesis was supported as far as the behaviors of the obese and normal males and normal females were concerned. The obese males ate significantly more as cue prominence was increased and both the normal males and females consumed approximately

the same amounts of food irrespective of cue prominence condition. However, as figures 2 and 28 illustrate, the obese females differed from the obese males in a diametrically opposed manner in their response to an increase in external, food-related stimuli.

Several factors, related to the experimental design, may have influenced these gender-related, differential consumatory responses by the obese to external food cues. Rosenthal (1966, 1968) has documented experimenter effects, one type involving "unconscious" distortion of the data by the experimenter independent of the event or subject being studied, and the other type involving the impact upon the data of the interaction of the experimenter and the subject. Although the experimental design of this study did not allow a statistical test for an experimenter effect, it was possible that the second type did occur in this study since a male experimenter only was utilized in the contacts with both the male and female subjects. It would be useful to investigate the impact of opposite-sex experimenters not simply for the purpose of replication but also to see if it is a possible potent factor in obesity treatment study outcomes.

A second experimental design factor was the "public" nature of the weighing of the subjects by the male experimenter. Another study utilizing a method of determining actual body weight both unobtrusively and overtly should be conducted in order to see if public weighing has a significant impact independent of an increase in cue prominence and the gender of the weigher upon the eating behavior of the female obese.

A third potential source of influence upon eating behavior which ought to be further explored is the effect of differences in socio-economic status. The inference was drawn from the various

cultural obesity studies (Moore, Stunkard, and Srole, 1962; Goldblatt, Moore, and Stunkard, 1965; Meyer and Tuchelt-Gallwitz, 1968; and Silverstone, 1969) that differences in socio-economic status have a differential influence upon the learned response bias to external, food-related stimuli of the obese versus the normals and males versus females. It was highly likely that such a difference existed between the subjects of this study and those of Schachter and Nisbett. The former attended a state-supported university while the latter attended expensive, privately endowed colleges. Studies exploring the relationship between socio-economic status and overt eating behavior would be useful. A recent experiment (Penick, Filion, Fox, and Stunkard, 1971) indicated via diagrams, but without comment, that such a relationship did exist. The study, which demonstrated the greater effectiveness of behavior modification techniques over insight-oriented therapies in the treatment of obesity, also suggested that behavior modification was even more successful among low socio-economic status subjects than among high socio-economic status subjects.

Another factor to be considered was the possible differential use of accurate versus inaccurate feedback data in the self-control of manifest behavior. Serendipity resulted in the discovery that underweight and normal weight females used more non-multiples of five to self-report their weight more accurately than did obese females who tended to use, as did all three male groups, multiples of five to inaccurately report their weight (see Appendix). If the use of non-multiples of five reflected a tendency of the subject to weigh herself more often and thus to have more accurate information about any changes in actual body weight, it could be hypothesized that normal and

underweight females, but not males and obese females, use accurate body weight as feedback data to help in the exercise of self-control over food-intake and thereby either maintaining or altering body weight. Overweight females, on the other hand, appeared to "lie" about, or distort, their weight, but this may have reflected not intentional lying but rather an avoidance of an aversive stimulus situation. By not weighing themselves frequently, the obese females had older, less accurate, less aversive information to use in a feedback loop involving eating behavior. In this study the weighing of the subjects just prior to providing food may have produced an external, aversive, food-related cue (e.g. body weight registered visibly on a scale) which the obese females used to control, albeit maladaptively, their eating behavior when faced with large amounts of food. This behavior was maladaptive because, unlike the high cue obese males who simply ate more, the high cue obese females went on an instant diet in which they literally stopped eating and unlike cigarette smoking, eating cannot be prudently controlled by simply ceasing to engage in the activity without longterm dire consequences. There is a need for further research on the use of veridical and nonveridical feedback data as a means of influencing the self-control of consumatory behavior.

The cultural obesity studies, the acquisition of identity literature (Fisher, 1973), and this study provide data which suggested that the aversiveness of veridical body weight data for obese females may be the result of the difference in social attitudes toward excess adiposity between males and females. The cultural studies, through investigation of the socio-economic status strata effects on socially

static and upwardly mobile males and females, indicated that different socio-economic levels differentially reinforce obesity both positively and negatively. As one moved up socio-economically, obesity was more negatively reinforced. The data from this study (see figure 7) indicated that at least on one socio-economic level the social conditioning histories appeared to have had predictable differentiating effects on the development of the potency part of the self-concepts of male and female normals and obese.

Fisher, (1973), in a review of the literature on the acquisition of feminine identification, pointed out that sexual identity was a component of general identity and cited Kohlberg's (1966) assertion that what was basic to sex-role differentiation was that children are born with structurally different bodies which consistently elicit from others in the social environment the differentiating labels "girl" and "boy". According to Kohlberg the core of feminine identity was the fact that her body was labelled as female. Other researchers (Kagan and Moss, 1962) have discovered that the closer the adherence to the stereotypic feminine role, in which physical appearance plays an important role, the greater the increase in worrying and discomfort. This finding has been replicated by others. Webb (1963) found a high positive correlation between high anxiety in adolescent girls and high femininity scores on the Gough (1957) Femininity Scale. Another investigator, Gray (1957), obtained a similar result when girls in grades 6-7 were rated for anxiety and femininity. Douvan and Adelson (1966) discovered that high-feminine girls exceeded low-feminine girls "in being self blaming, worrying, experiencing discomfort during menstruation, being narcissistic, and worrying about their physical

appearance" (cited in Fisher, 1973, p. 111). The results of this study would appear to reconfirm these findings.

The fourth hypothesis predicted the obese would report less anxiety and depression than the nonobese would report. The score obtained on Shipman and Plesset's Anxiety-Depression Scale was the dependent variable utilized. The female, but not the male, anxiety data supported the hypothesis. There was no significant difference between normal and obese males in the amount of anxiety reported. The obese females, however, reported significantly less anxiety than that of the males. The latter difference approached significance. These results supported the contention that the more closely a female approximated the stereotypic feminine role, the greater her worrying and discomfort. No such relationship was found for the males, normal or obese.

The analysis of the depression data revealed a relationship between negative effect and approximation of the stereotypic feminine role. Females were significantly more depressed than males and the normals were significantly more depressed than the obese. Again the normal females reported the most depression of the four experimental groups.

When the anxiety and depression scores were pooled as a general expression of negative feeling, a significant sex x weight x cue interaction occurred. Again the male data failed to support the hypothesis since there was no significant difference between the males on the bases of weight or cue prominence. The low cue female data did support the hypothesis. The normal females reported feeling significantly more negative than both male groups and the obese females.

Furthermore the latter reported themselves as feeling less negatively than either of the male groups. There was no significant difference across level of cue prominence in the amount of negative effect reported by the normal female group but the level of negative effect reported by the obese females increased significantly with the increase in cue prominence. This increase in negative effect, of worry and discomfort, may have been the result of the aversiveness of a stimulus situation containing both veridical body weight information and large amounts of readily available food which the high cue obese females denied themselves.

Certain aspects of the Semantic Differential results also suggested that the aversiveness of veridical body weight data was a function of, and mediated by, certain aspects of the subjects' self-concepts. The analysis of the Semantic Differential data along the evaluative and activity dimensions supported, for the most part, that section of the third hypothesis which predicted the self-concepts of the normal weight subjects would not differ as a function of gender. Along these two dimensions the pattern of self-ratings was equivalent for both normal females and males: the Ideal Me ratings were higher than the Personal Me and Public Me ratings which were approximately the same.

Along the potency dimension, however, there was a significant shift in the patterns across genders. There was no significant difference between the normal male and female Personal Me and Public Me ratings. The normal females, except for wishing they were "lighter", appeared to be satisfied with their level of potency since their Ideal Me rating was approximately the same as for the Personal Me

and Public Me ratings. The normal males, however, significantly increased their Ideal Me rating over their Personal Me and Public Me scores. These normal males wished they were "stronger", "heavier", and "larger" than they perceived themselves to be. It would appear that these were socially highly desirable masculine attributes.

That part of the third hypothesis which predicted the self-concepts of the obese subjects would be more negative than those of the normal weight subjects was rejected along the evaluative and activity dimensions and supported along the potency dimension. On the evaluative and activity dimensions the patterning of the self-concept ratings for normals and obese were equivalent: the Personal Me and Public Me ratings were about the same for both weight groups and there was a significant similar increase for both groups in the Ideal Me scores. Both weight groups wanted to be even "better" and more "active" than they perceived themselves to be and as they perceived others as seeing them, but neither group saw itself significantly more negatively than the other. This part of the third hypothesis was supported in an unusual manner along the potency dimension.

Osgood, et al (1957), the developers of the Semantic Differential, assumed that the higher the score the more positive the self-concept and the lower the score the more negative the self-concept. However, the results of the data analysis suggested that this assumption may not always be valid and that under certain conditions a higher score may represent a more negative self-image (see Appendix). Whereas the pooled obese ratings across all three self-concepts for the potency dimension gave the obese a significantly higher overall score than the normals obtained (figure 6), the normals wanted ideally to be more

of how they described themselves personally and publicly while the obese wished ideally to be less of what they perceived themselves to be personally and publicly. For the normals a positive valence was implied in the self-evaluation for they wanted to be more of what they already perceived themselves to be. For the obese a negative valence was implied for the same descriptive terms of the bipolar scales since the obese wished to be less than they described themselves to be. Furthermore, the lower Ideal Me ratings by the obese occurred only on certain bipolar adjective scales. Both the obese males and obese females wanted to be "lighter" and "smaller". On the other potency bipolar scales the obese rated themselves either as, or more positively than, did the normals.

The third part of the third hypothesis, predicting that the self-concepts of the female obese subjects would be more negative than those of the male obese subjects, was supported. When the obese were differentiated on the basis of gender, the male obese, except for wanting to be somewhat "lighter", tended to be satisfied with how they and others perceived them. The obese females, on the other hand, were greatly dissatisfied with their Personal and Public Selves in terms of size and weight. They wanted to be much "smaller" and "lighter". The females accounted for almost all the negative self-evaluation among the obese on the potency dimension and this did not differ as a function of cue level. This finding would appear to be incongruent with the data indicating that the normal females report more negative effect in the form of anxiety and depression than do the obese females. However, the Total Semantic Differential Scores (figure 11) showed that the negative aspects of the obese females'

self-concepts found along the potency dimension were hidden by self-rating. Furthermore, the obese females, who reported the least amount of anxiety and depression, also showed the least amount of discrepancy between the three self-concepts rated. The normal females, normal males, and obese males, all of whom tended to reveal more negative effect than the obese females, also all showed the largest increases in what they wished to be over what they and others perceived themselves to be.

A comparison of figures 7 and 2 shows, in the former, that _the obese males, the obese females, the normal males, and the normal females each had a distinctive self-evaluation pattern which did not vary as a function of cue level_. Figure 2, on the other hand, shows that _each of these groups had a distinctively different overt eating pattern that also varied as a function of cue level_. The data thus raises serious reservations about the generality of Schachter's hypothesis regarding the difference in response between obese and normal subjects to external, food-related cues. The data, however, also tends to support his more general theoretical position that there is not a one-to-one relationship between a set or pattern of physiological processes (i.e. low blood sugar, gastric motility) and a specific behavior (i.e. eating) or psychological state (i.e. self-concept), that both cognitive (i.e. processing of feedback) and situational factors (i.e. cue prominence) determine what label (i.e. hunger, anxiety, depression) is applied by the individual to his or her state of physiological arousal.

The data certainly support the need for revision of Schachter's specific hypothesis that the behavior of the obese person, irrespective of gender, responds in a consistent manner to external, food-related cues such as sight, smell, taste, and time while being relatively

insensitive to the physiological correlates of food-deprivation. It is obvious that the same food stimuli and veridical body weight feedback elicited a different overt consumatory reaction from the obese females than from the obese males. Schachter's hypothesis does not allow for these gender differences. The data from this study do not permit hard and fast conclusions regarding the differential influence on response to food-related cues of constitutional versus learned sex-role differences and, in fact, actually raise many questions for further research. Certainly the series of studies done by Nisbett, Schachter, and their associates should be redone using both female and male subjects. It could also be inferred from the results of this experiment that the gender of the subject and certain aspects of his or her self-concepts must be seriously considered in any treatment program whose goal is, as Harris (1969) suggests, "the development of self-control through altering the stimulus conditions under which the behavior occurs and generating self-produced consequences of the behavior" (p. 264). This study seems to demonstrate that differences in self-control, as reflected in consumatory behavior, are mediated by differences in self-concept. It would also appear that this study has made a start in defining the extent and effect of sex differences in responsiveness to internal and external food-related cues.

SUMMARY

A review of the obesity literature raised questions about the general applicability of Schachter's hypothesis which states: (1) the consumatory behavior of normal weight Ss is primarily under the control of internal, food-related stimuli since normals accurately label the physiological state of arousal associated with hunger; and (2) the eating behavior of the obese Ss, who do not label their visceral state accurately, is essentially under the control of external, food-related cues. The doubt was elicited because the experimental data supporting the hypothesis was obtained from male Ss only, yet the obesity literature suggested that gender was an important influence on obese Ss' overt consumatory behavior which was also related to differences in self-concepts between normals and obese. The literature also indicated that the reporting of anxiety and depression differed between the obese and the normals.

The following hypotheses were promulgated and tested. 1. (a) When external, food-related cues are prominent, food-deprived obese Ss will eat more than food-deprived normal weight Ss; (b) when external, food-related cues are minimized, food-deprived obese Ss will eat less than food-deprived normal weight Ss; and (c) irrespective of cue level prominence, normal weight Ss will eat equal amounts. 2. (a) When external, food-related cues are prominent, food-deprived obese females will eat more than food-deprived obese males; (b) when external, food-related cues are minimized, the obese females and the obese males

will eat equal amounts of food and this will be less than either group will eat in the high prominent situation; and (c) in both the high prominent and the low prominent food cue conditions, the normal weight females and normal weight males will eat equal amounts of food. 3. (a) The self-concepts of the obese Ss will be more negative than those of the normal weight Ss; (b) the self-concepts of the female obese Ss will be more negative than those of the male obese Ss; and (c) the self-concepts of the normal weight Ss will not differ as a function of gender. 4. The obese will report less anxiety and depression than the nonobese will report.

One hundred and twelve Ss were selected on the basis of gender (male and female) and weight (obese and normal). They were exposed to two levels (high and low) of stimulus (food) prominence thus giving eight groups of 14 Ss each. The dependent variables were (1) weight in ounces of food consumed, (2) percent of body weight in food consumed, and the scores from a questionnaire consisting of (3) the Semantic Differential, (4) Shipman and Plesset's Anxiety-Depression Scale, and (5) Rotter's Social Reaction Inventory. The study's apparatus and procedure essentially replicated those of Nisbett (1968b).

Analyses of variance showed that the consumatory behavior of the males (obese and normal) and the normal females replicated Nisbett's results, but the eating behavior of the obese females was opposite to that predicted by Schachter's hypothesis. The obese males increased their food consumption as cue prominence increased, the normal Ss ate the same irrespective of cue prominence and gender, but the obese females ate less in the high cue condition than in the low cue

situation. Along the potency dimension, but not the evaluative and activity dimensions of the Semantic Differential, the self-concepts of the obese were more negative than those of the normals and the self-concepts of the female obese were more negative than those of the male obese. The self-concepts of the normals did not differ as a function of gender along the three dimensions except for the normal males wanting, ideally, to be more potent. Analyses of variance also provided partial support for hypothesis 4 and revealed gender-related differences. The obese reported significantly less depression than did the normals and males reported less depression than did females. Obese females reported less anxiety than normal females, but there was no difference in the reporting of anxiety between obese and normal males.

Rosenthal's (1966,1968) experimenter effects, the "public" nature of the weighing of the Ss, socio-economic factors, the differential use of accurate versus inaccurate feedback data in the self-control of manifest behavior, and the acquisition of feminine identity were discussed as possible influencing factors in the departure of the obese females' behavior from that predicted by Schachter. The anxiety and depression results replicated, and were discussed in the context of, the findings of studies investigating the affective impact of deviation by females from the stereotypic feminine body image. The mediation of the aversive veridical bodyweight data via the Ss' self-concept pattern; the challenge to the validity of Osgood, et al's (1957) assumption that higher self-concept scores necessarily meant more positive self-images; and the distinctive self-concept patterns which each of the experimental groups (obese males, normal

males, obese females, and normal females) produced and which did not vary as a function of cue level, although consumatory behavior did, were all discussed in terms of the Semantic Differential results.

It was concluded that the results supported the contention that revision of Schachter's hypothesis was necessary since it failed to predict the obtained weight- and gender-related consumatory behavior, that further research was needed in this area, and that the preliminary findings have important implications for obesity treatment research.

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APPENDIX

APPENDIX

LIST OF TABLES

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Significance of Weight Differences between Normal and Obese Groups and between Self-Reported and Measured Weight.

When the obese and normal groups were compared statistically on the basis of percent of weight deviation from the standards for normal weight as listed in the Table of Average Weights (see Appendix), each of the groups was well within the range limits for either obesity or normal weight as defined by Nisbett (1968a, 1968b). No member of the obese groups weighed less than the lower limit of 15 percent above the normal average weight for his or her combination of height and age. The average weight for the obese group as a whole as 27.30 percent above the normal standard. The normal weight group averaged just 2.79 percent below the normal standard but this was well within the limits set by Nisbett for this group of 10 percent above and below the average weight. As indicated in tables 32 and 33, when male and female percents of over- and under-weight were pooled across cue prominence the single significant difference between the obese and normal groups was on the basis of weight alone ($p < .001$) with no significant differences as a function of gender, cue, or their interactions.

When the measured weight in pounds was examined, certain differences between the groups became apparent (see tables 34, 35, and 36 and figures 16 and 17). These differences were hidden in the percent over- and under-weight measure where the standard weights, from which the percentage was calculated, differed for men and women. These differences were: (1) pooled normal and obese males weighing more than their pooled female counterparts ($p < .001$); (2) pooled male

and female obese weighing more than the pooled normals ($p < .001$); (3) the obese males increasing more in weight over the normal males than did the obese females over the normal females ($p < .01$); and (4) pooled obese males weighing significantly more ($p < .001$) than the pooled obese females. Thus, the statistical evaluation of measured weight in pounds indicated there were significant differences on the bases of weight, sex, and the interaction of sex and weight. That these differences were unavoidable and, in fact, predetermined may be seen by examining the Table of Average Weights for Men and Women (see Appendix) and the Table of Weight Ranges for Normal Weight and Overweight Men and Women (see Appendix). In the former table the average weight for women is always less than the weight for men of the same height and age. The table of weight ranges also indicates that the limits for both normals and obese are lower for women than for men of equal height.

Initially the members of each group had been pre-selected on the basis of self-reported weight. However, self-report proved to be an inaccurate measure for when the scores based on the difference between reported weight and actual weight were analyzed (tables 37 and 38; figures 18 and 19), there were significant main effects due to sex ($p < .05$) and weight ($p < .05$). Females misreported their weights to a greater extent than did males and the obese underestimated their actual weights more than did the normals.

The necessity for reporting one's height (tables 39, 40, 41, and 42; figures 20 and 21) did not produce the same discrepancy between self-report and actual measurement as did weight. There was no significant main effect due to weight. Although there was a significant

sex main effect ($p < .025$) this may have been the result of writing errors since only two subjects, one obese female and one normal female, significantly over-reported their heights and, in both cases, the discrepancy was an extraordinary 12 inches.

The self-reports of weight on the screening questionnaire produced another, quite serendipitous sex difference which merits further investigation. When self-reported weights given in non-multiples of five pounds were examined, a significant sex main effect and a sex by wieght interaction effect affecting accuracy resulted (table 43; figure 22). Only 14.7 percent of the males used non-multiples of five to report their weights while the average percentage for females was 30 percent. Furthermore, although males did not differ much as a function of weight in their reporting, females shifted from 46 percent of the underweight to 33 percent of the normals to only 11.1 percent of the obese using non-multiples of five to report their respective weights.

While the significant weight difference between the obese and normal groups had been prearranged and the concomitant significantly lesser weight of females for any given experimental condition was built into the Table of Average Weights, weight matching across the sexes proved to be impossible for several other reasons as well. First, there was an extremely limited sample of obese females from which to draw. Second, there was a somewhat limited sample of overweight males available. Third, there was no way to know prior to the subject's actual appearance and weighing just how much he or she really weighed. The discrepancies between reported and measured weight turned out to be greater for the obese females than for the

overweight males and larger for the obese than for the normals. It was necessary to compensate for this matching problem and still permit a comparison of results between this study which used both female and male subjects and those experiments of Schachter and Nisbett which used only male subjects. Therefore the differences between the cells were evaluated using both the "weight in ounces of total amount of food consumed" as Schachter and Nisbett had and the "percent of body weight in total amount of food consumed". The former dependent variable permitted the direct comparison of the results of this study to the results obtained by Schachter and his associates. The second dependent variable was employed to overcome the weight matching problem and thus make the eating behaviors of the female and male subjects more comparable.

TABLE 32.

Analysis of Variance of Percent Over- and Under-weight.

Source	df	MS	F	P
Sex	1	10.94	0.12	n.s.
Weight	1	25350.22	278.75	<.001
Cue	1	157.94	1.74	n.s.
Sex x Weight	1	37.72	0.41	n.s.
Sex x Cue	1	135.08	1.49	n.s.
Weight x Cue	1	58.58	0.64	n.s.
Sex x Weight x Cue	1	31.08	0.34	n.s.
Error (S/XWC)	104	90.94		

TABLE 33.

Cell Means and Standard Deviations of the Analysis of Variance of Percent Over- and Under-weight.

Source		Means (Standard Deviations)	
Sex		Female	Male
		12.57	11.95
Weight		Obese	Normal
		27.30	-2.79
Cue		High	Low
		13.45	11.07
Sex x Weight		Obese	Normal
	Female	27.03	-1.89
	Male	27.57	-3.68
Sex x Cue		High	Low
	Female	14.86	10.29
	Male	12.04	11.86
Weight x Cue		High	Low
	Obese	29.21	25.39
	Normal	-2.32	-3.25
Sex x Weight x Cue		Female	
		High	Low
	Obese	30.57 (15.24)	23.50 (4.91)
	Normal	-0.86 (5.53)	-2.93 (6.20)
		Male	
	Obese	27.86 (12.04)	27.29 (12.76)
	Normal	-3.79 (4.28)	-3.57 (4.90)

TABLE 34.

Analysis of Variance of Measured Weight.

Source	df	MS	F	P
Sex	1	34756.51	94.98	<.001
Weight	1	56385.44	154.08	<.001
Cue	1	695.01	1.90	n.s.
Sex x Weight	1	2536.51	6.93	<.01
Sex x Cue	1	0.22	0.00	n.s.
Weight x Cue	1	122.22	0.33	n.s.
Sex x Weight x Cue	1	157.94	0.43	n.s.
Error (S/XWC)	104	365.95		

TABLE 35.

Cell Means and Standard Deviations of the Analysis of Variance of Measured Weight.

Source		Means (Standard Deviations)	
Sex		Female	Male
		139.57	174.80
Weight		Obese	Normal
		179.63	135.74
Cue		High	Low
		159.68	154.70
Sex x Weight		Obese	Normal
	Female	157.25	121.89
	Male	202.00	147.61
Sex x Cue		High	Low
	Female	142.11	137.04
	Male	177.25	172.36
Weight x Cue		High	Low
	Obese	181.07	178.18
	Normal	138.29	131.21
Sex x Weight x Cue		Female	
		High	Low
	Obese	159.93 (21.74)	154.57 (9.63)
	Normal	124.29 (7.61)	119.50 (11.91)
		Male	
	Obese	202.21 (25.20)	201.79 (33.96)
	Normal	152.29 (8.40)	142.93 (9.74)

FIGURE 16.

Mean Measured Weight in Pounds as a Function of Weight.

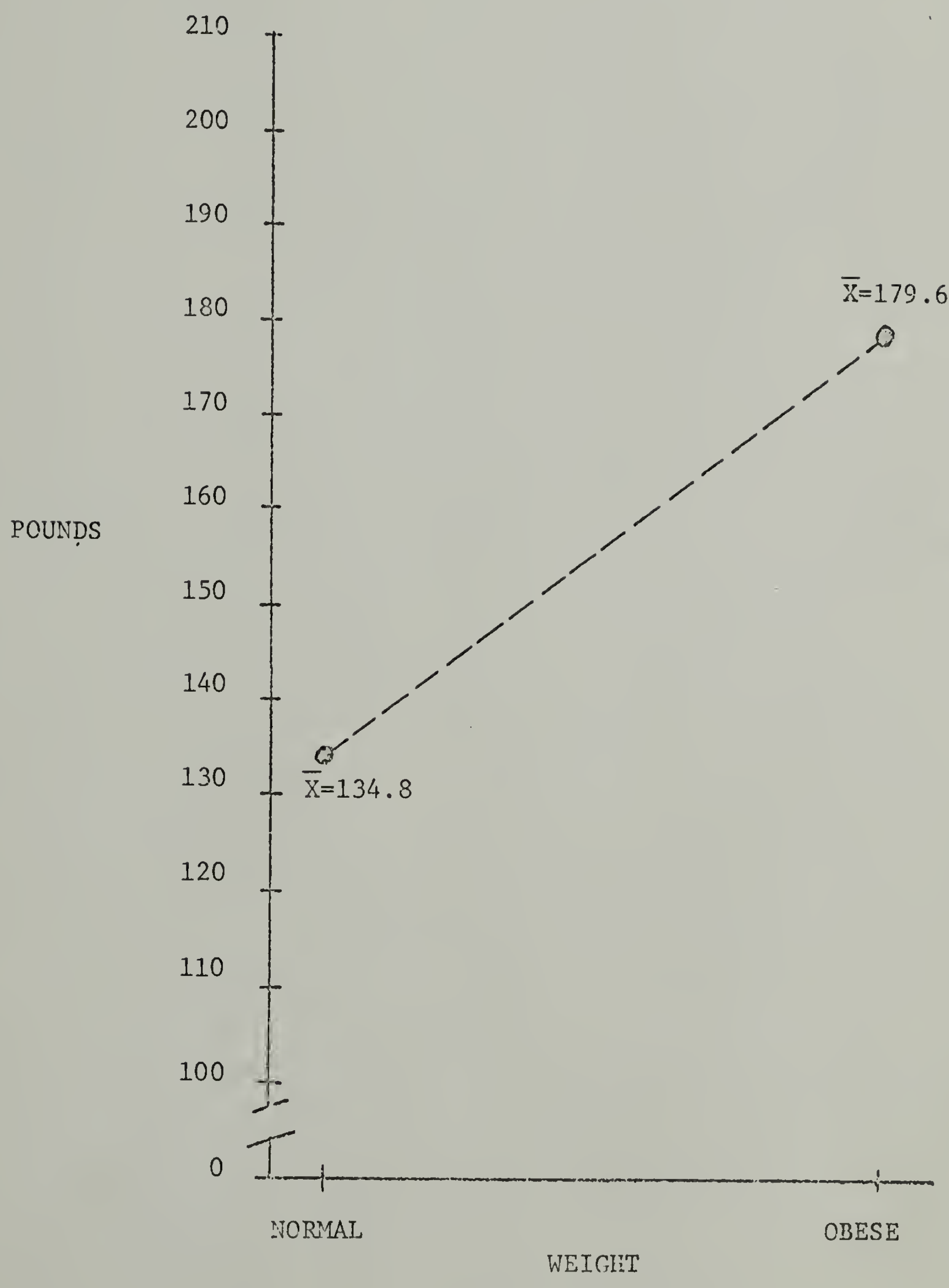


FIGURE 17.

Mean Measured Weight in Pounds as a Function of the Interaction of Gender and Weight.

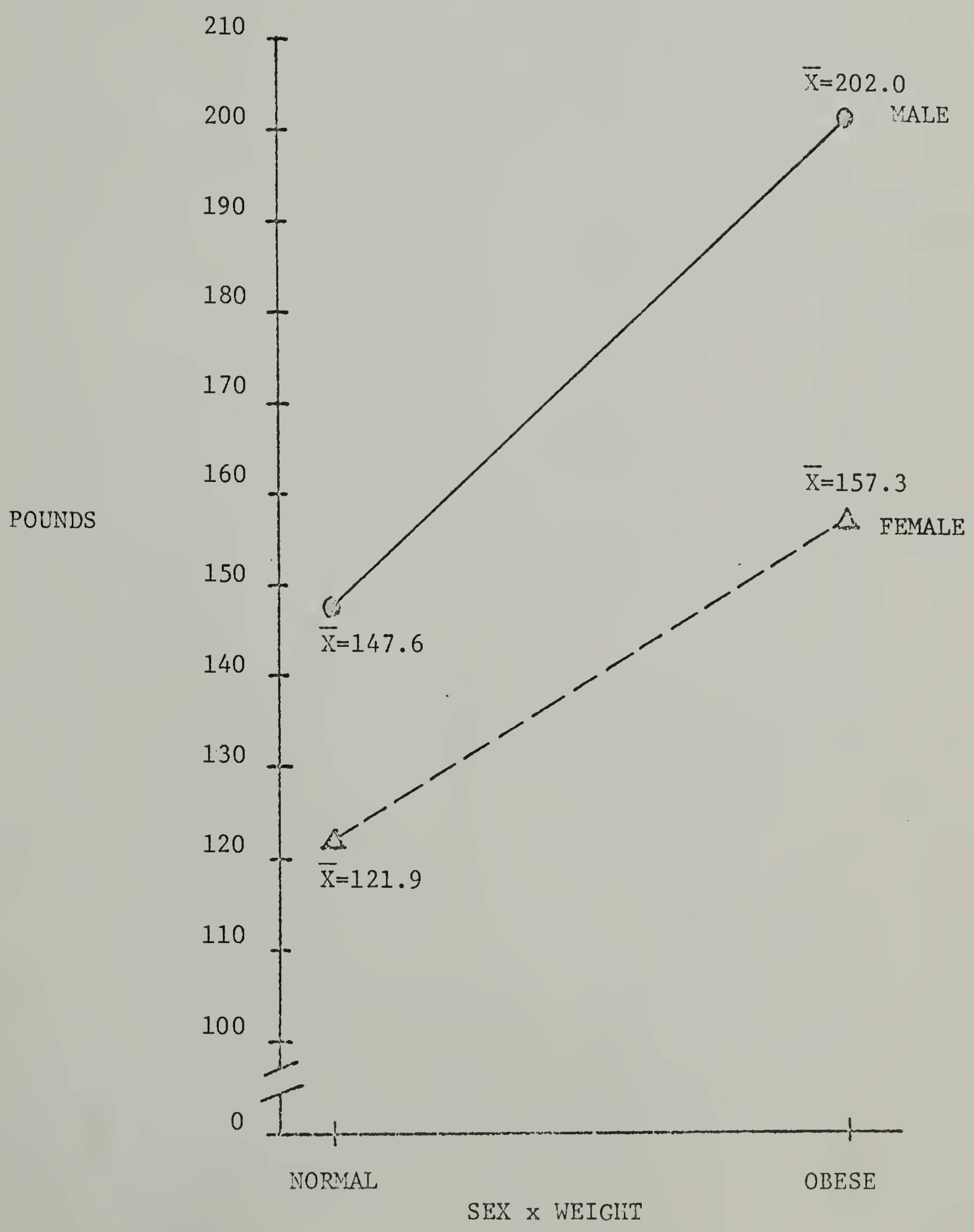


TABLE 36.

Measured Weight in Pounds as a Function of the Interaction of Gender and Weight: The Results of One Tail t-Tests (df=54) on the Difference between the Means.

	$\bar{X}_1-\bar{X}_2$	t	P
Male Normal - Male Obese	-54.3930	-9.2066	$<.001$
Female Normal - Female Obese	-35.3570	-9.5870	$<.001$
Male Normal - Female Normal	25.7140	10.0720	$<.001$
Male Obese - Female Obese	44.7500	6.9041	$<.001$
Male Normal - Female Obese	-9.6430	-2.6643	$<.005$

TABLE 37.

Analysis of Variance of the Difference Score of Reported Weight Minus Measured Weight.

Source	df	MS	F	P
Sex	1	228.57	4.49	<.05
Weight	1	222.89	4.38	<.05
Cue	1	180.04	3.54	n.s.
Sex x Weight	1	72.32	1.42	n.s.
Sex x Cue	1	8.04	0.16	n.s.
Weight x Cue	1	112.00	2.20	n.s.
Sex x Weight x Cue	1	17.29	0.34	n.s.
Error (S/XWC)	104	50.89		

TABLE 38.

Cell Means and Standard Deviations of the Analysis of Variance of Weight Difference Scores.

Source		Means (Standard Deviations)	
Sex		Female	Male
		-7.86	-5.00
Weight		Obese	Normal
		-7.84	-5.02
Cue		High	Low
		-7.70	-5.16
Sex x Weight		Obese	Normal
	Female	-10.07	-5.64
	Male	-5.61	-4.39
Sex x Cue		High	Low
	Female	-9.39	-6.32
	Male	-6.00	-4.00
Weight x Cue		High	Low
	Obese	-10.11	-5.57
	Normal	-5.29	-4.75
Sex x Weight x Cue		Female	
		High	Low
	Obese	-13.00 (12.82)	-7.14 (6.35)
	Normal	-5.79 (4.86)	-5.50 (5.50)
		Male	
	Obese	-7.21 ((6.91)	-4.00 (3.44)
	Normal	-4.79 (5.45)	-4.00 (5.43)

FIGURE 18.

Mean Difference Scores (Reported Weight Minus Measured Weight) in Pounds as a Function of Gender.

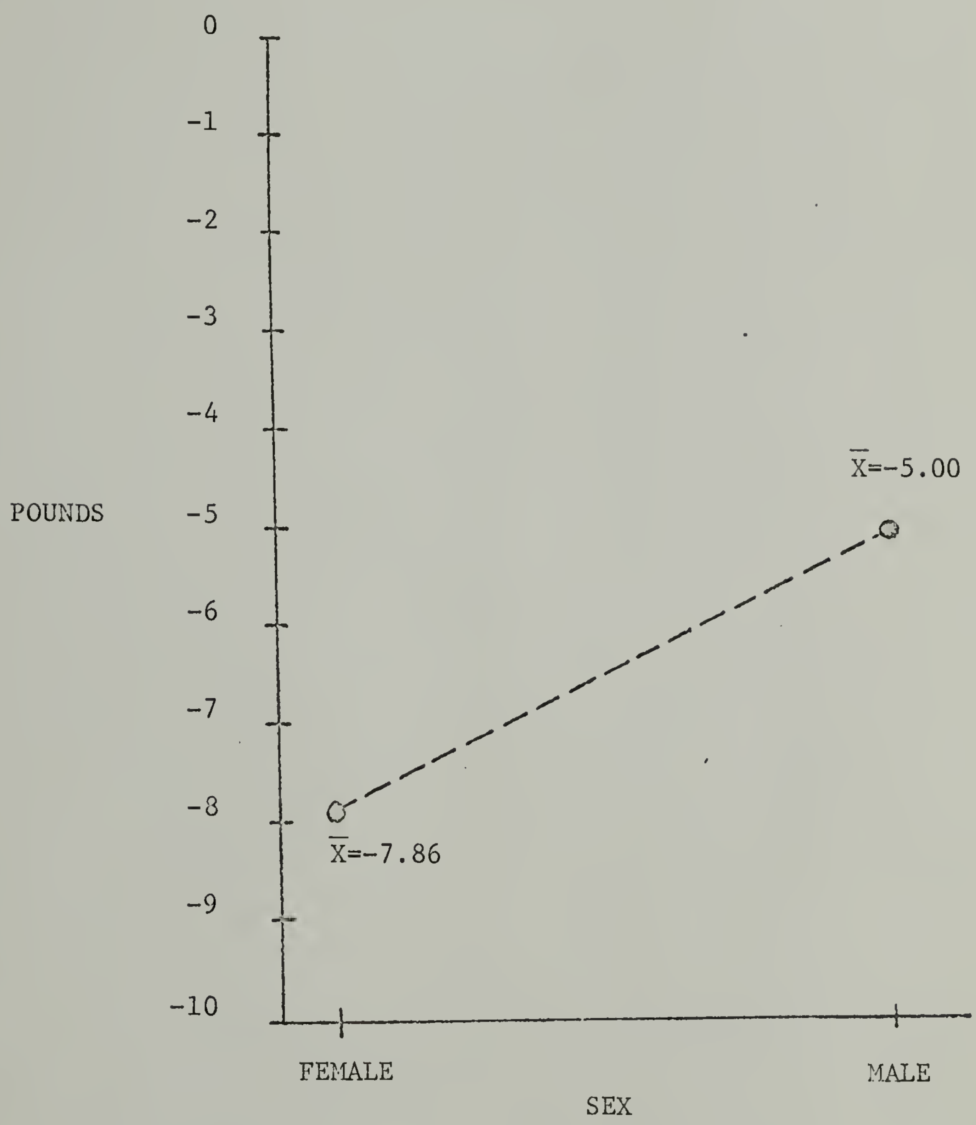


FIGURE 19.

Mean Difference Scores (Reported Weight Minus Measured Weight) in Pounds as a Function of Weight.

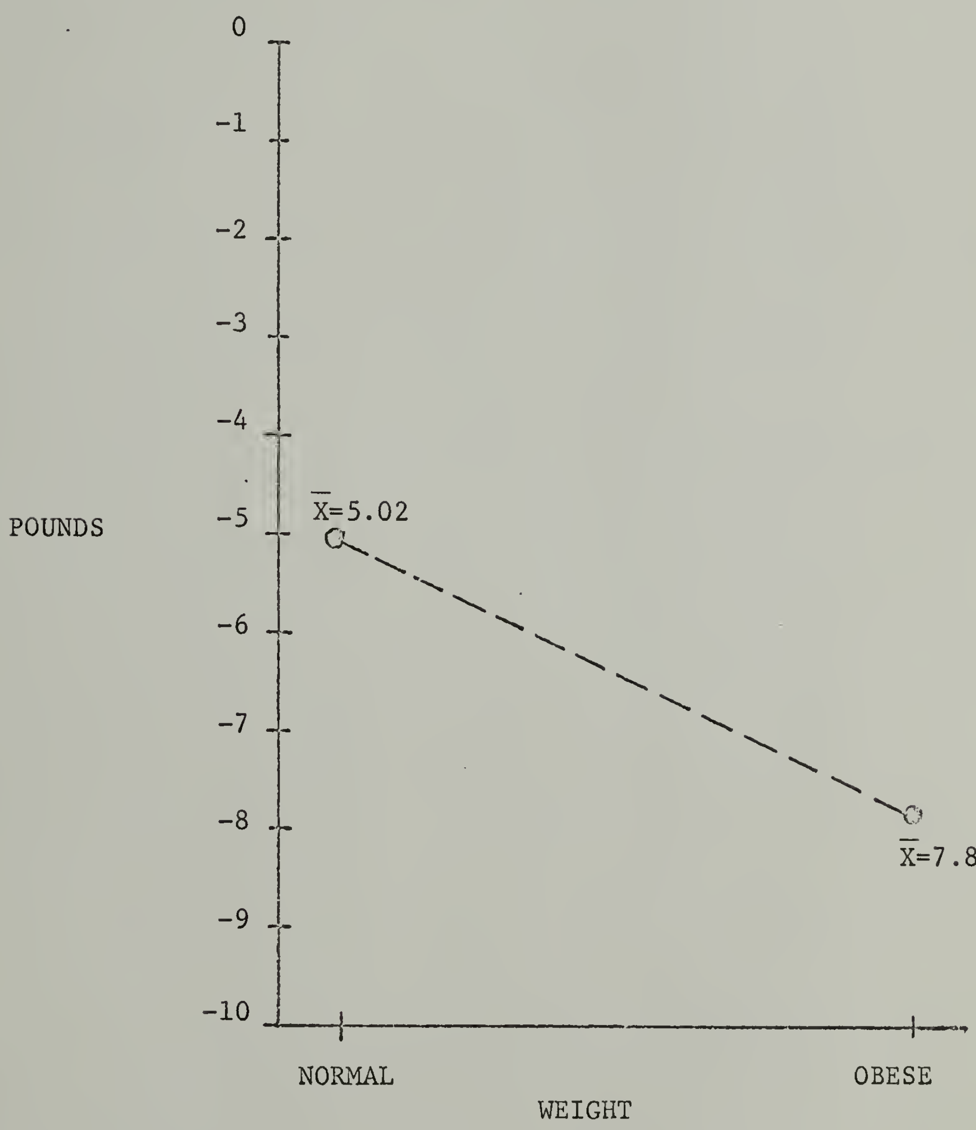


TABLE 39.

Analysis of Variance of Measured Height.

Source	df	MS	F	P
Sex	1	687.56	104.49	$<$.001
Weight	1	9.43	1.43	n.s.
Cue	1	16.90	2.57	n.s.
Sex x Weight	1	14.29	2.17	n.s.
Sex x Cue	1	12.22	1.86	n.s.
Weight x Cue	1	25.08	3.81	n.s.
Sex x Weight x Cue	1	2.43	.37	n.s.
Error (S/XWC)	104	6.58		

TABLE 40.

Cell Means and Standard Deviations of the Analysis of Variance of Measured Height.

Source		Means (Standard Deviations)	
Sex		Female	Male
		64.64	69.59
Weight		Obese	Normal
		67.41	66.83
Cue		High	Low
		67.50	66.73
Sex x Weight		Obese	Normal
	Female	64.57	64.71
	Male	70.24	68.95
Sex x Cue		High	Low
	Female	64.70	64.59
	Male	70.31	68.88
Weight x Cue		High	Low
	Obese	67.32	67.49
	Normal	67.69	65.96
Sex x Weight x Cue		Female	
		High	Low
	Obese	64.30 (2.44)	64.84 (1.56)
	Normal	65.09 (1.87)	64.32 (2.83)
		Male	
	Obese	70.34 (2.85)	70.14 (3.82)
	Normal	70.29 (2.04)	67.61 (1.47)

FIGURE 20.

Mean Measured Height as a Function of Gender.

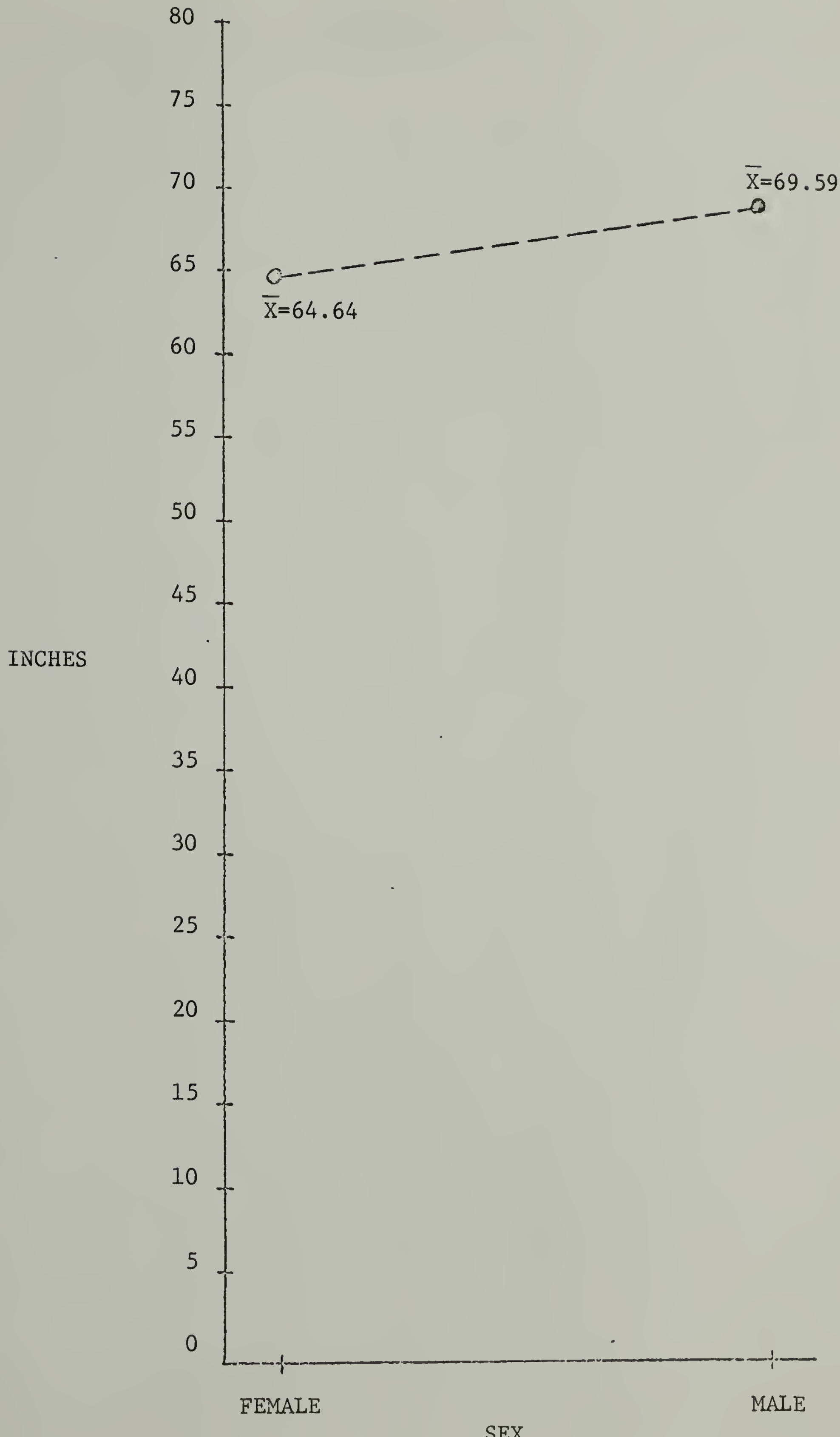


TABLE 41.

Analysis of Variance of the Difference Score of Reported Height Minus Measured Height.

Source	df	MS	F	P
Sex	1	15.94	5.28	$<.025$
Weight	1	3.14	1.04	n.s.
Cue	1	0.00	0.00	n.s.
Sex x Weight	1	0.85	0.28	n.s.
Sex x Cue	1	1.45	0.48	n.s.
Weight x Cue	1	10.17	3.37	n.s.
Sex x Weight x Cue	1	1.34	0.44	n.s.
Error (S/XWC)	104	3.02		

TABLE 42.

Cell Means and Standard Deviations of the Analysis of Variance of Height Difference Scores

Source		Means (Standard Deviations)	
Sex		Female	Male
		-0.73	0.02
Weight		Obese	Normal
		-0.19	-0.52
Cue		High	Low
		-0.36	-0.35
Sex x Weight		Obese	Normal
	Female	-0.65	-0.81
	Male	0.28	-0.23
Sex x Cue		High	Low
	Female	-0.85	-0.62
	Male	0.13	-0.09
Weight x Cue		High	Low
	Obese	-0.49	0.12
	Normal	-0.22	-0.82
Sex x Weight x Cue		Female	
		High	Low
	Obese	-1.18 (3.14)	-0.13 (0.60)
	Normal	-0.52 (0.57)	-1.11 (3.17)
		Male	
	Obese	0.20 ().64)	0.36 (0.57)
	Normal	0.07 (0.95)	-0.54 (0.44)

FIGURE 21.

Mean Height Difference Scores (Reported Height Minus Measured Height) as a Function of Gender.

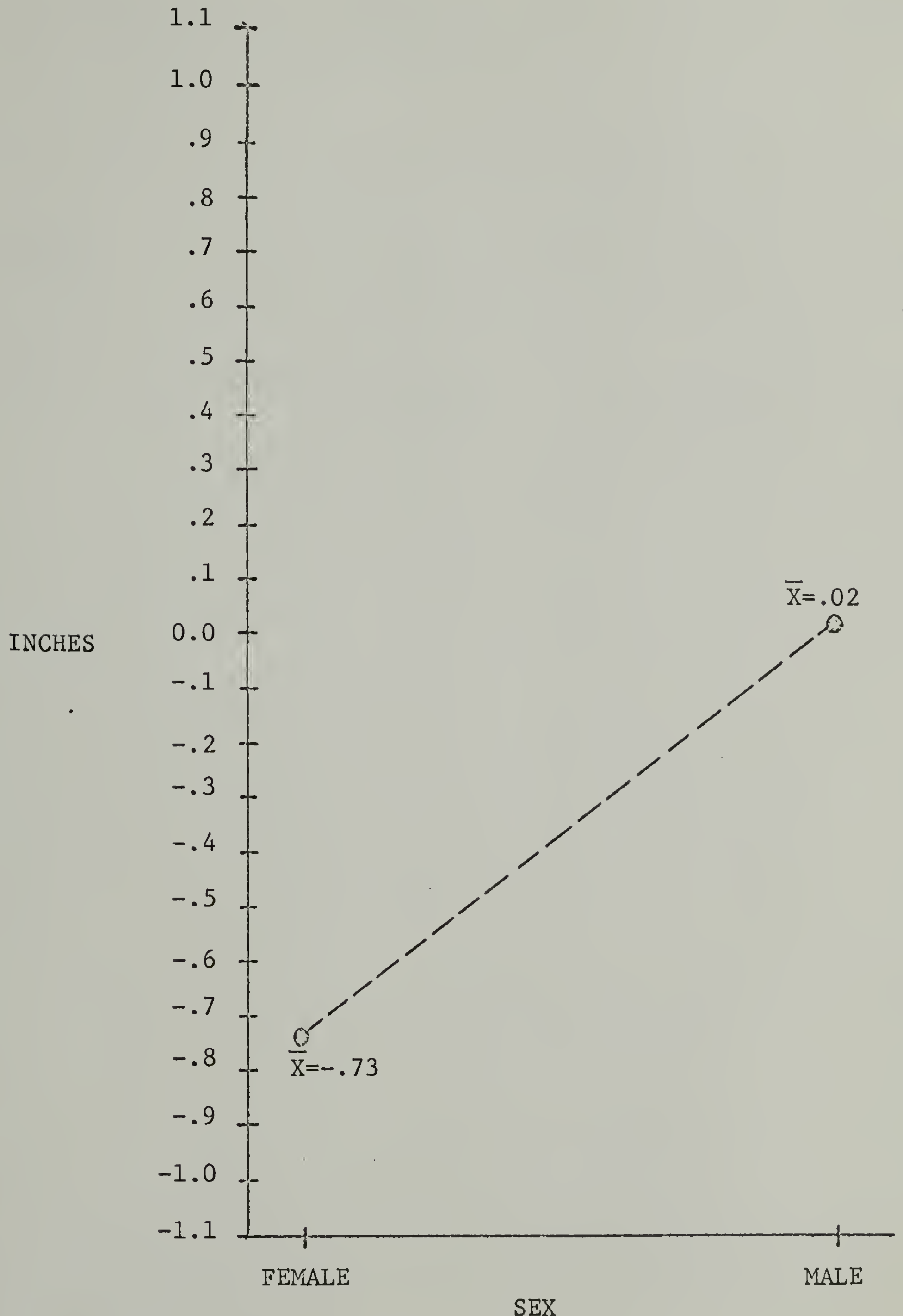


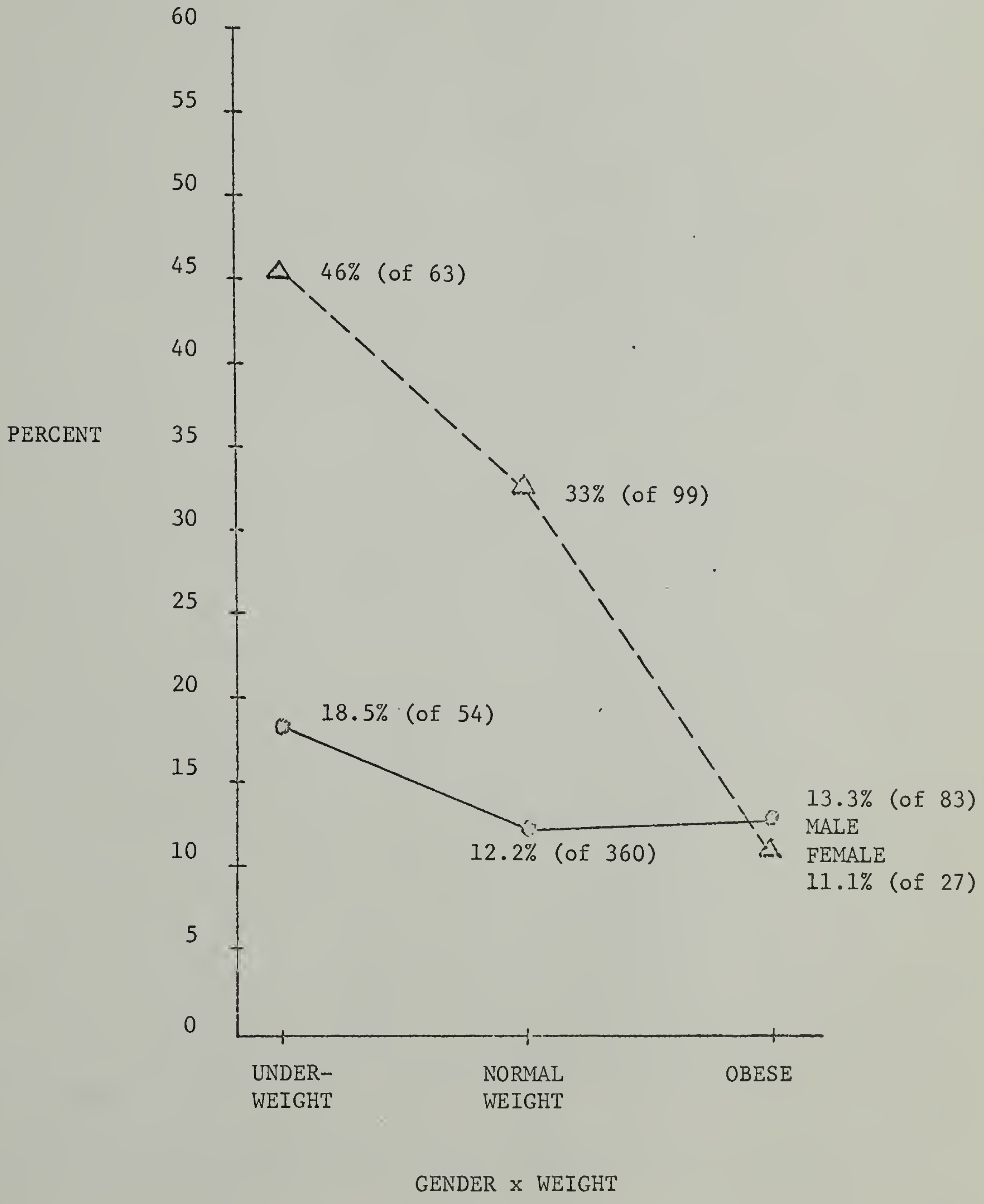
TABLE 43.

Percentage of Subjects Responding to Questionnaire Who Reported Their Weight in Non-Multiples of 5.

	Underweight	Normal Weight	Obese
Female	46% (of 63 Ss)	33% (of 99 Ss)	11.1% (of 83 Ss)
Male	18.5% (of 54 Ss)	12.2% (of 360 Ss)	13.2% (of 27 Ss)

FIGURE 22.

Percentage of Subjects Responding to the Questionnaire Who Reported Their Weight in Non-multiples of Five as a Function of the Interaction of Gender and Weight.



Statistical Analysis Using Weight in Ounces of Food Taken from Cooler and Consumed.

One of Schachter's contentions was that food-deprived obese individuals would not "work" for food, e.g. would not physically exert themselves for food that was present but neither visible nor within easy reach. According to Schachter, the obese might consume all food in sight in both high and low cue prominence situations but they would not "work" for more food even if still hungry. On the other hand, food-deprived normals who failed to be sated under the low cue condition would "work" for more food until sated. In the high cue situation where it was probably the normals would be sated it would be as unlikely for the normals as for the obese to "work" for more food.

Schachter's prediction about the eating behavior in the low cue condition was not supported by the results of this study. Subjects did leave the experimental room, did go to the cooler, and did take more food only in the low cue situation (tables 44 and 45; figure 23). The main effect of cue did approach significance ($p < .10$). But the two effects, weight and weight x cue, predicted by Schachter's corollary were not significant. Rather the main effect of sex and the sex x cue interaction both approached significance ($p < .10$). Figure 23 shows, first, that only males, no females, went to the cooler. This gender difference was not predicted by Schachter. Second, within the low cue male group a result opposite to that predicted by Schachter occurred. The obese male group rather than the normal weight group took and consumed the most food from the cooler with the dif-

ference only barely approaching significance ($p < .15$) as shown in table 46. Furthermore, the raw data showed that _more_ low cue obese males than normal males went to the cooler. Third, the high cue results did partially support Schachter in that no member of any of the four high cue situation groups went to the cooler for more food.

TABLE 44.

Analysis of Variance of Weight in Ounces of Food Taken from Cooler and Consumed.

Source	df	MS	F	P
Sex	1	4.13	3.72	(<.10)
Weight	1	1.63	1.47	n.s.
Cue	1	4.13	3.72	(<.10)
Sex x Weight	1	1.63	1.47	n.s.
Sex x Cue	1	4.13	3.72	(<.10)
Weight x Cue	1	1.63	1.47	n.s.
Sex x Weight x Cue	1	1.63	1.47	n.s.
Error (S/XWC)	104	1.11		

TABLE 45.

Cell Means and Standard Deviations of the Analysis of Variance of the Weight in Ounces of Food Taken from Cooler and Consumed.

Source		Means (Standard Deviations)	
Sex		Female	Male
		0.00	0.38
Weight		Obese	Normal
		0.31	0.07
Cue		High	Low
		0.00	0.38
Sex x Weight		Obese	Normal
	Female	0.00	0.00
	Male	0.63	0.14
Sex x Cue		High	Low
	Female	0.00	0.00
	Male	0.00	0.77
Weight x Cue		High	Low
	Obese	0.00 (0.00)	0.63 (1.34)
	Normal	0.00 (0.00)	0.14 (0.52)
Sex x Weight x Cue		Female	
		High	Low
	Obese	0.00 (0.00)	0.00 (0.00)
	Normal	0.00 (0.00)	0.00 (0.00)
		Male	
	Obese	0.00 (0.00)	1.25 (2.68)
	Normal	0.00 (0.00)	0.29 (1.03)

FIGURE 23.

Mean Weight in Ounces of Food Taken from Cooler and Consumed as a Function of the Interaction of Gender, Weight, and Cue.

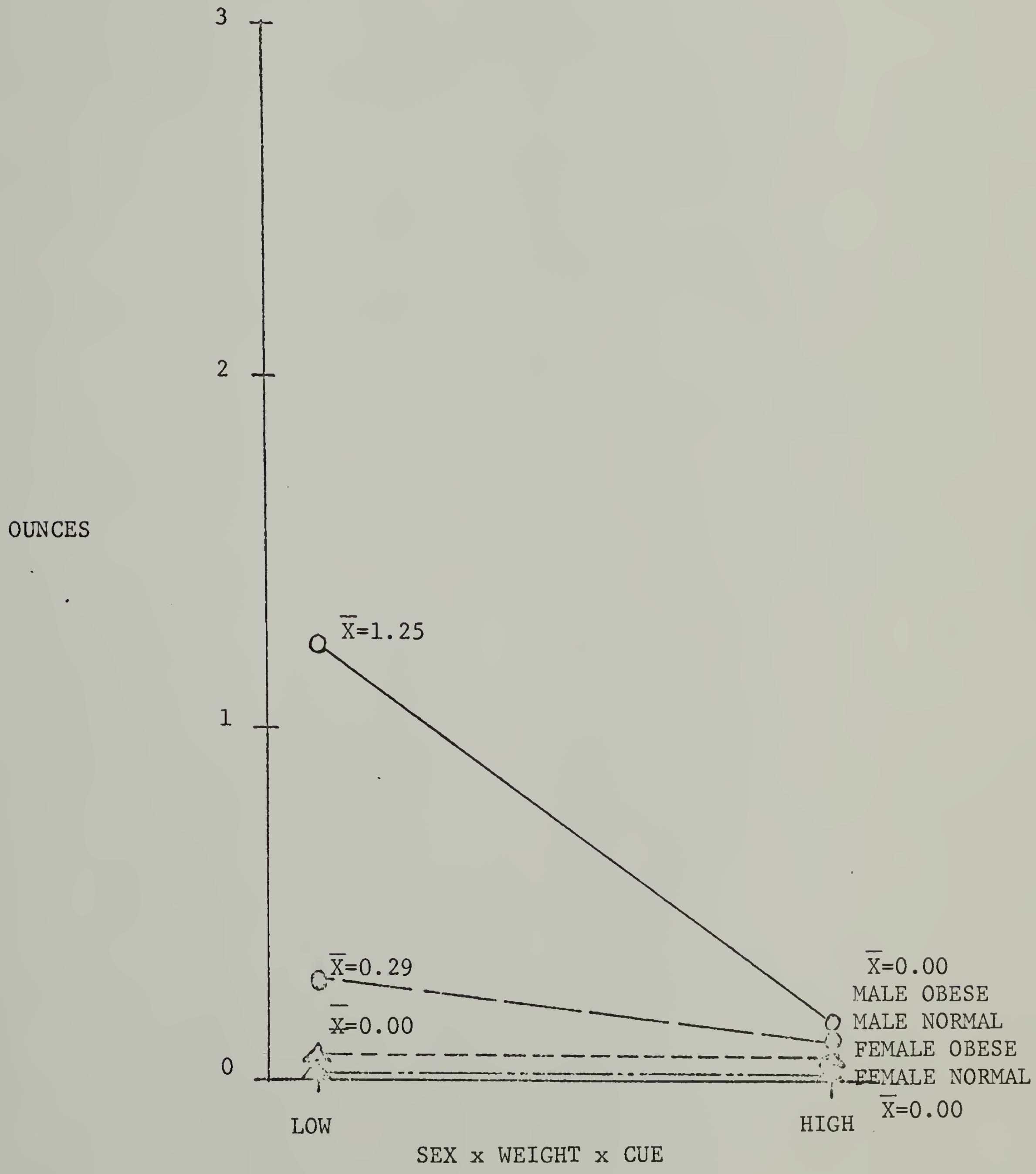


TABLE 46.

Mean Weight in Ounces of Food Taken from Cooler and Consumed as a Function of the Interaction of Gender, Weight, and Cue: The Results of One Tail t-Tests (df=26) on the Difference between the Means.

	$\bar{X}_1-\bar{X}_2$	t	P
Low Male Obese - Low Male Normal	0.9600	1.2511	($<$.15)
Low Male Normal - Low Female Normal	0.2900	1.0530	n.s.
Low Male Normal - High Male Normal	0.2900	1.0530	n.s.

<u>Statistical Analysis Using Percent (Multiplied by 10,000) of Body Weight in Food Taken from Cooler and Consumed</u>.

The data analysis based upon this dependent variable (tables 47 and 48; figure 24) and the conclusions drawn from this analysis replicated those of the Statistical Analysis Using Weight in Ounces of Food Taken from Cooler and Consumed (see pp.143-144).

TABLE 47.

Analysis of Variance of Percent (Multiplied by 10,000) of Body Weight in Food Taken from the Cooler and Consumed.

Source	df	MS	F	P
Sex	1	45.01	3.57	($<$.10)
Weight	1	10.94	0.87	n.s.
Cue	1	45.01	3.57	($<$.10)
Sex x Weight	1	10.94	0.87	n.s.
Sex x Cue	1	45.01	3.57	($<$.10)
Weight x Cue	1	10.94	0.87	n.s.
Sex x Weight x Cue	1	10.94	0.87	n.s.
Error (S/XWC)	104	12.61		

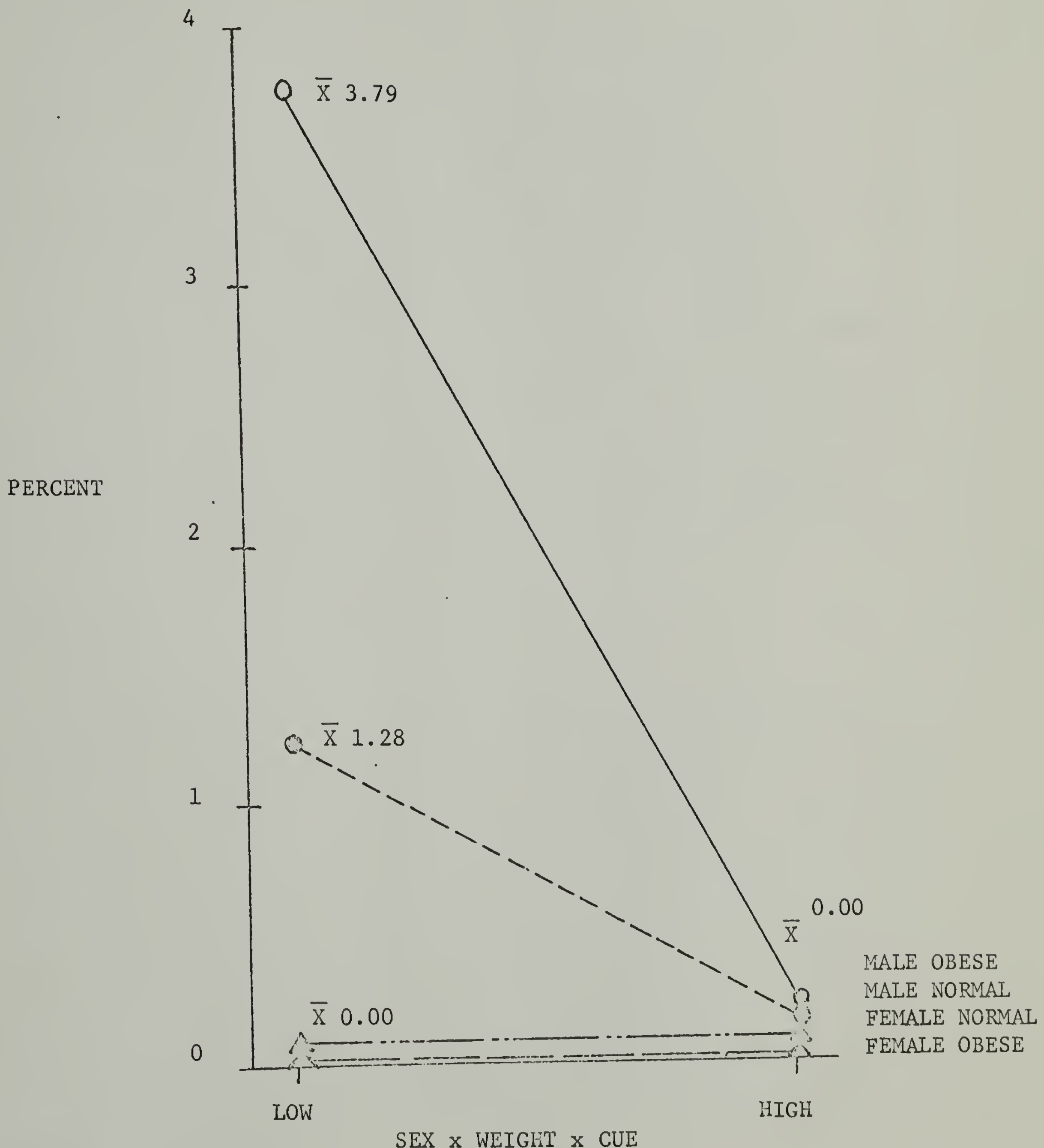
TABLE 48.

Cell Means and Standard Deviations of the Analysis of Variance of Percent (Multiplied by 10,000) of Body Weight in Food Taken from the Cooler and Consumed.

Source		Means (Standard Deviations)	
Sex		Female	Male
		0.00	1.27
Weight		Obese	Normal
		0.95	0.32
Cue		High	Low
		0.00	1.27
Sex x Weight		Obese	Normal
	Female	0.00	0.00
	Male	1.89	0.64
Sex x Cue		High	Low
	Female	0.00	0.00
	Male	0.00	2.53
Weight x Cue		High	Low
	Obese	0.00 (0.00)	1.89 (4.25)
	Normal	0.00 (0.00)	0.64 (2.32)
Sex x Weight x Cue		Female	
		High	Low
	Obese	0.00 (0.00)	0.00 (0.00)
	Normal	0.00 (0.00)	0.00 (0.00)
		Male	
	Obese	0.00 (0.00)	3.79 (8.50)
	Normal	0.00 (0.00)	1.28 (4.64)

FIGURE 24.

Mean Percent (Multiplied by 10,000) of Body Weight in Food Taken from Cooler and Consumed as a Function of the Interaction of Gender, Weight, and Cue.



Statistical Analysis Using Percent (Multiplied by 10,000) of Body Weight in Total Amount of Food Consumed.

The percent was multiplied by 10,000 to enable the University of Massachusetts computer to handle the small decimal values resulting from dividing "weight of food consumed" by "body weight" and multiplying by 100. It should also be kept in mind that the data upon which the percent was based was subject to uncontrollable variability. While it was possible to weigh the small amount of food involved carefully to the nearest ounce, the weight of the individual had to be to the nearest pound. The body weight figure was also subject to differences from subject to subject in weights of clothing and of items carried in pockets. With these reservations about the accuracy of the data in mind, the statistical analysis of this dependent variable also indicated that Schachter's hypothesis required revision.

Hypothesis 1.

The weight x cue interaction (tables 49 and 50); figure 27) required by Schachter's hypothesis was not significant when males and females were pooled. However, the main effects of sex ($p < .025$) and weight ($p < .05$) were significant. Thus, as figure 25 shows, pooled obese and normal males not only consumed more food than females as noted when "total food in ounces consumed" was analyzed, but they also ate in food a higher percentage of their body weight than did the females. Figure 26 indicates that the food eaten by normals pooled across cue was a greater percentage of their body weight than was the case for the pooled obese. This apparent anomaly was in part a function of the ceiling effect built into the low cue condition

where the food available for consumption was limited. Thus, since the normals and the obese each had an equal amount of food available and each tended to eat most of the food available in the low cue situation, the normals because they weighed less automatically ate an amount which constituted a higher percentage of their body weight.

Figure 27 and table 51 show the results of pooling across gender: the normals in both cue conditions ate a larger percentage than did the obese and the differences approached significance ($p < .10$). When this data was pooled across gender and cue (tables 49 and 50; figure 26), the difference between the higher percentage normals and the lower percentage obese became significant ($p < .05$).

In sum, using the data obtained from all the Ss and taking into account the percent ceiling effect in the low cue condition, Schachter's predictions tended to hold true for normals of both sexes but not for the obese.

Hypothesis 1(a) predicted that "when external food-related cues are prominent, food-deprived obese subjects will eat more than food-deprived normal weight subjects...". This prediction was not supported when subjects were pooled across gender (figure 27; table 51). The high cue normals consumed a higher percentage than the high cue obese and this difference approached significance ($p < .10$). Thus, when the behavior of the female subjects was not analyzed separately Schachter's results failed to be replicated.

Hypothesis 1(b) stated that "when external food-related cues are minimized, food-deprived obese subjects will eat less than food-deprived normal weight subjects...". Again the data analysis failed to significantly support Schachter when the results of female and

male behavior was pooled. The low cue normals did eat a higher percent of their body weight in food than did the low cue obese (figure 27; table 51) but the difference only approached significance ($p < .10$).

According to hypothesis 1(c), "irrespective of cue prominence level, normal weight subjects will eat equal amounts." As when the dependent variable was "weight in ounces of total amount of food consumed", this part of Schachter's hypothesis relating to the eating behavior of normals was statistically supported (figure 28; table 52). The differences between the low male normal group and the high male normal group, and between the concomitant female groups, were not significant.

Hypothesis 2.

As with the analysis of data based upon the first dependent variable, the prediction of a difference in eating behavior between obese females and obese males was supported but not the direction of the differences (figure 18; table 24).

It was predicted that "when external food-related cues are prominent, food-deprived obese females will eat more than food-deprived obese males." Although the difference in percent of body weight in total food consumed between high cue obese females and high cue obese males was highly significant ($p < .005$), the difference was in the opposite direction to that predicted. That is, the high cue obese males ate a higher, not lower as predicted, percentage than did the equivalent female group.

The second part of the second hypothesis predicted that "when

external food-related cues are minimized, the obese females and the obese males will eat equal amounts of food and this will be less than either group will eat in the high prominent situation." In general, the data supported this prediction (figure 28; table 52) but, where it did not, the difference again was based on gender. The low cue female obese group was not significantly different from the low cue male obese in percent of body weight in total food consumed. As predicted, the low cue male obese ate significantly less ($p < .005$) than the high cue male obese but, unpredicted, there was no significant difference in the percent between low cue female obese and high cue female obese. Furthermore, the latter actually ate less, not more as predicted, than did the low cue female obese. It would appear that using "percent of body weight" rather than "weight in ounces" eliminated the matching problem discussed above (pp. 23-24) since the previously obtained significant difference between the low cue obese females and low cue obese males did not happen here. However, a similar difference between males and females in the direction of shift from low cue to high cue occurred again.

The third part of the second hypothesis stated that "in both the high prominent and low prominent food cue conditions, the normal weight females and the normal weight males will eat equal amounts of food" and the statistical analysis (figure 28; table 52) provided support for the prediction. Although the male normals in both high and low cue conditions tended to consume an amount of food constituting a higher percentage of their body weight than the equivalent female groups, the differences were not significant. As predicted there were no significant differences between the four normal groups. Again,

the use of percent of body weight rather than weight of food in ounces eliminated a matching problem and a previously obtained significant difference between normal males and females (p. 24) disappeared.

TABLE 49.

Analysis of Variance of Percent (Multiplied by 10,000) of Body Weight in Total Amount of Food Consumed.

Source	df	MS	F	P
Sex	1	2760.14	6.43	$<.025$
Weight	1	1824.14	4.25	$<.05$
Cue	1	594.32	1.38	n.s.
Sex x Weight	1	200.89	0.47	n.s.
Sex x Cue	1	1032.14	2.40	n.s.
Weight x Cue	1	69.14	0.16	n.s.
Sex x Weight x Cue	1	1442.89	3.36	n.s.
Error (S/XWC)	104	429.52		

TABLE 50.

Cell Means and Standard Deviations of the Analysis of Variance of Percent (Multiplied by 10,000) of Body Weight in Total Amount of Food Consumed.

Source		Means (Standard Deviations)	
Sex		Female	Male
		49.98	59.91
Weight		Obese	Normal
		50.91	58.98
Cue		High	Low
		57.25	52.64
Sex x Weight		Obese	Normal
	Female	44.61	55.36
	Male	57.21	62.61
Sex x Cue		High	Low
	Female	49.25	50.71
	Male	65.25	54.57
Weight x Cue		High	Low
	Obese	52.43 (22.29)	49.39 (13.92)
	Normal	62.07 (23.53)	55.89 (16.49)
Sex x Weight x Cue		Female	
		High	Low
	Obese	39.50 (27.58)	49.71 (18.62)
	Normal	59.00 (23.06)	51.71 (21.85)
		Male	
	Obese	65.36 (17.00)	49.07 (9.22)
	Normal	65.14 (24.00)	60.07 (11.13)

FIGURE 25.

Mean Percent (Multiplied by 10,000) of Body Weight in Total Amount of Food Eaten as a Function of Gender.

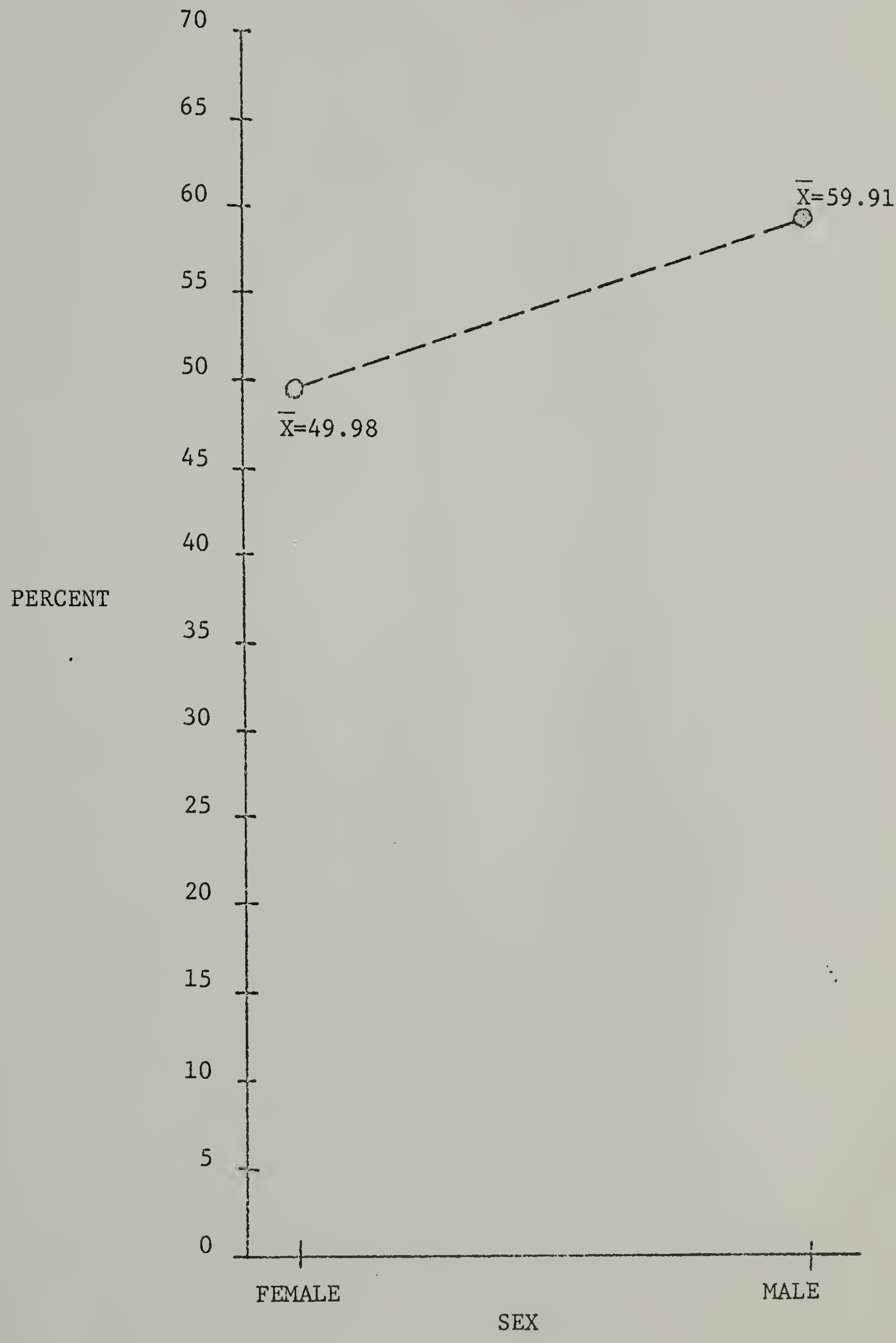


FIGURE 26.

Mean Percent (Multiplied by 10,000) of Body Weight in Total Amount of Food Consumed as a Function of Weight.

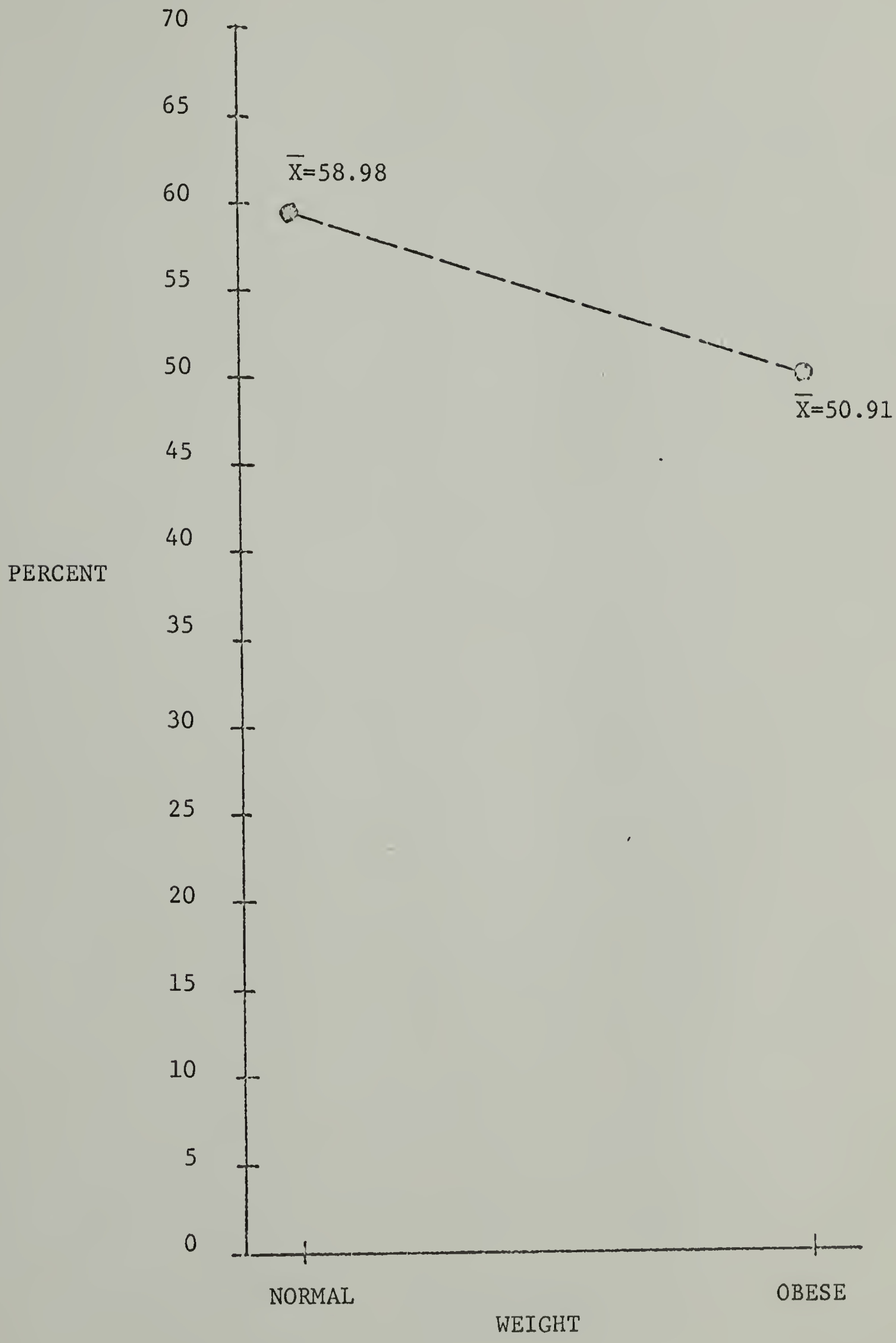


FIGURE 27.

Mean Percent (Multiplied by 10,000) of Body Weight in Total Amount of Food Consumed as a Function of the Interaction of Weight and Cue.

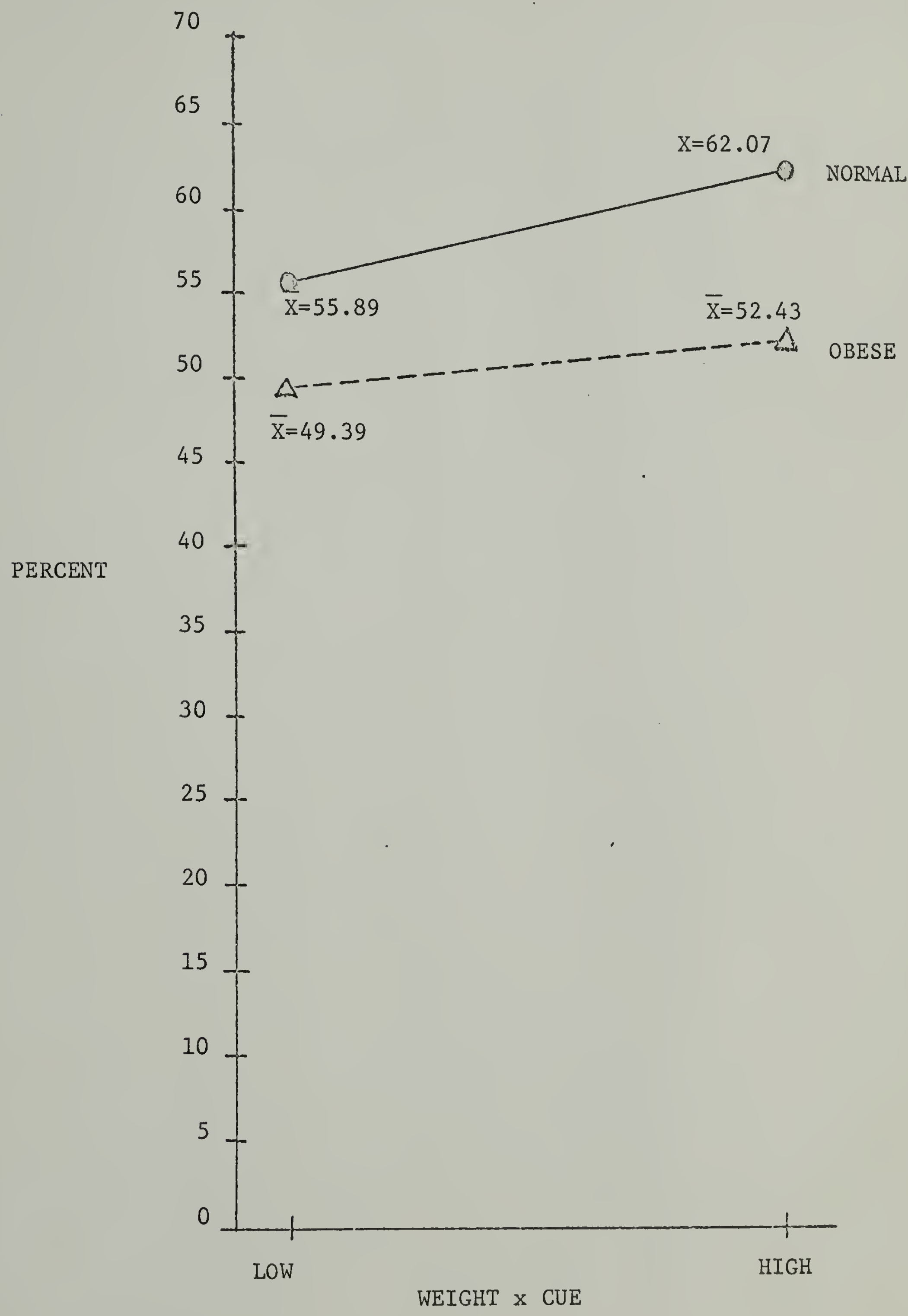


TABLE 51.

Mean Percent (Multiplied by 10,000) of Body Weight in Total Amount of Food Consumed as a Function of the Interaction of Weight and Cue: The Results of One Tail t-Tests (df-54) on the Difference between the Means.

	$\overline{X}_1-\overline{X}_2$	t	P
High Normal - High Obese	9.6400	1.5738	($<$.10)
Low Normal - Low Obese	6.5000	1.5938	($<$.10)
High Normal - Low Normal	6.1800	1.1381	($<$.15)
High Obese - Low Obese	3.0400	0.5884	n.s.

FIGURE 28.

Mean Percent (Multiplied by 10,000) of Body Weight in Total Amount of Food Consumed as a Function of the Interaction of Gender, Weight, and Cue.

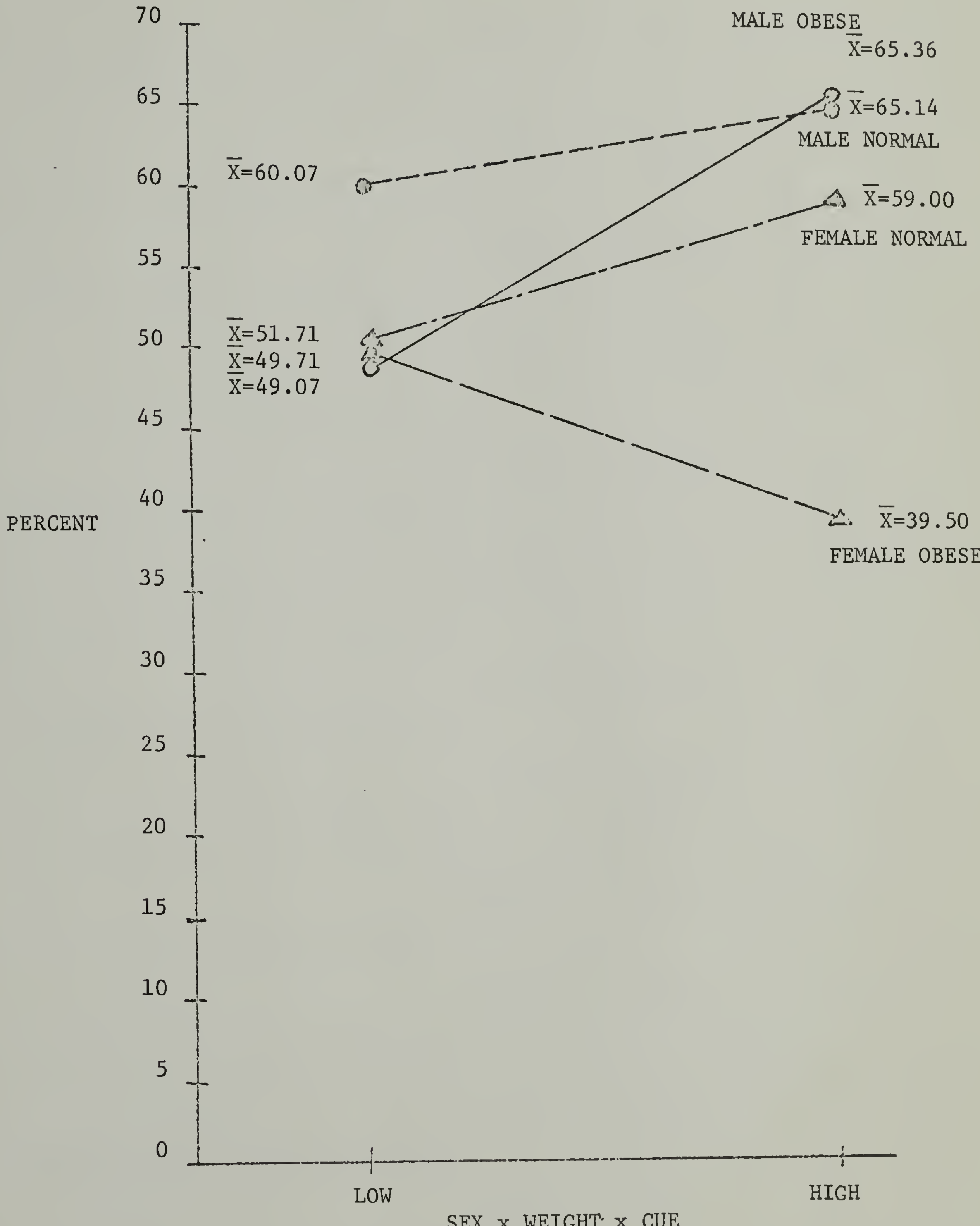


TABLE 52.

Mean Percent (Multiplied by 10,000) of Body Weight in Total Amount of Food Consumed as a Function of the Interaction of Gender, Weight, and Cue: The Results of One Tail t-Tests (df=26) on the Difference between the Means.

	$\bar{X}_1-\bar{X}_2$	t	P
Low Male Obese - High Male Obese			
	-16.2860	-3.1509	<.005
Low Male Normal - High Male Normal			
	-5.0720	-0.7173	n.s.
Low Female Obese - High Female Obese			
	10.2140	1.1483	n.s.
Low Female Normal - High Female Normal			
	-7.2860	-0.8582	n.s.
Low Female Normal - Low Male Obese			
	2.6430	0.4169	n.s.
Low Female Normal - Low Male Normal			
	-8.3570	-1.2752	n.s.
Low Female Normal - Low Female Obese			
	2.0000	0.2607	n.s.
Low Male Normal - Low Female Obese			
	10.3570	1.7865	<.05
Low Male Normal - Low Male Obese			
	11.0000	2.8480	<.005
Low Female Obese - Low Male Obese			
	0.6430	0.1158	n.s.
High Male Obese - High Male Normal			
	0.2140	.0272	n.s.

Table 52 continued on next page.

TABLE 52 (continued)

	$\overline{X}_1-\overline{X}_2$	t	P
High Male Obese - High Female Normal			
	6.3570	0.8302	n.s.
High Male Obese - High Female Obese			
	25.8570	2.9861	$<.005$
High Male Normal - High Female Normal			
	6.1430	0.6906	n.s.
High Male Normal - High Female Obese			
	25.6430	2.6241	$<.01$
High Female Normal - High Female Obese			
	19.5000	2.0295	$<.05$

Further Statistical Analysis Using Semantic Differential Scores.

Osgood, et al (1957) the developers of the Semantic Differential, assumed that the higher the score the more positive the self-concept and the lower the score the more negative the self-concept. However, the results of the following data analysis suggested that this assumption may not always be valid and that under certain conditions a higher score may represent a more negative self-image.

If it was assumed that the Ideal Self score, in relation to the Personal Self and Public Self scores, represented the most positive value along that particular bipolar scale, then the cell means of the bipolar adjective scales (see Appendix: figures 29-36 and tables 53-60) represented a strong challenge to the assumption of the higher the score the more positive the self-concept. For two of the eight groups used in this study, one average bipolar score along the potency dimension of the Ideal Self was less than the same bipolar scale scores representing the Personal Self and Public Self. Both the low and high cue female normal group Ideal Self scores were in the direction of "Light" on the numerically lower end of the "Light-Heavy" scale of the potency dimension (Appendix: figures 33 and 34; tables 57 and 58). The Ideal Self scores for four groups on two bipolar scales along the potency dimension were less than for either of the other two Selves. The low cue female obese group (Appendix: figure 35; table 54), the high cue female obese group (Appendix: figure 36; table 60), the low cue male obese group (Appendix: figure 29; table 53), and the high cue male obese group (Appendix: figure 30; table 54) each scored lower ideally along both the "Light-Heavy" and the "Small-Large" scales of the potency dimension than each did along the same scales personally

and publicly. These scores seemed to indicate that all the female groups, both normal and obese, and the obese males perceived being lighter than they actually were as more desirable and therefore more positive. Only for the two normal weight male groups (Appendix: figure 31 and 32; tables 55 and 56) were all the Ideal Self adjective scale scores higher than for the Personal Self and the Public Self along all three dimensions. These results seemed to indicate not only do self-concepts as well as overt eating behaviors differ as a function of gender and weight but that under certain conditions a higher Semantic Differential score, as a function of gender and weight, may represent a more negative self-concept. Further investigation of these relationships would appear to be warranted.

Along the evaluative dimension (tables 5 and 6) only Repetition was significant ($p < .001$). All subjects tended to perceive themselves (Me) as "good" as they thought the world (Public Me) saw them. However, ideally all subjects wished to be significantly "better" (figure 37). An examination of the pattern of the sex x weight x cue x repetition scores (figure 3) did not reveal any striking deviations from this pattern by any of the eight groups used in this study. The only differences occurred in the size of the scores forming the pattern. Out of 36 one-tailed t-tests performed on these scores (tables 7 and 8), only those performed on the differences between the high cue normal male group and high cue normal female group ($p < .05$) and between the high cue normal female group and low cue normal female group ($p < .025$) resulted in significance.

The potency dimension presented quite a different picture. The main effect of sex was significant (tables 9 and 10) at less than the

.025 level with males scoring themselves higher than did females (figure 38). Weight was also a significant ($p < .001$) factor with the obese scoring higher than the normals (tables 8 and 10; figure 4). Thus it appeared that males and the obese had more positive self-concepts than, respectively, females and the normal weight subjects.

The other two significant results suggested something else. The sex x repetition interaction was highly significant at better than the .005 level (tables 9 and 10). Figure 5 and table 11 show that males and females did not differ significantly in their Personal Self and Public Self concepts. However, their respective Ideal Selves differed significantly ($p < .001$) with males increasing significantly over male Me ($p < .001$) and male Public Me ($p < .001$) while females decreased significantly below female Me ($p < .005$) and female Public Me ($p < .05$). Thus, males wanted to be more potent while females wished they were less potent.

The sex x repetition interaction pattern was reversed in the significant ($p < .005$) weight x repetition interaction pattern (figure 6). Table 13 shows that obese and normals did differ significantly in their Personal Self ($p < .001$) and Public Self ($p < .001$) concepts with the obese scoring higher on both (table 12). Ideally, however, the obese wished to be significantly less potent than both the obese Me ($p < .005$) and the obese Public Me ($p < .025$) while the normals wanted to be significantly more potent than either the normal Me ($p < .001$) and the Normal Public Me ($p < .001$). This resulted in no significant difference between the scores of the obese Ideal Me and the normal Ideal Me.

In sum, it appeared that for males and normals "potency" was desirable while for females and the obese it was less desirable.

Figure 7 indicates the relationships were not quite that simple. The obese males scored themselves high and essentially the same across all three self-concepts. Table 13 shows that no significant Me and Public Me differences occurred between the female obese and male obese. The same table, however, indicates that an extremely significant difference ($p < .0005$) resulted between Ideal Me male obese and Ideal Me female obese with the latter showing a precipitous decrease in score. It was obvious, therefore, the obese females accounted for the significance of the lower obese Ideal Me score obtained in the significant weight x repetition interaction (figure 6; table 12).

An inversion of the obese groups' pattern of response was found when an analysis of the normal groups' weight scores was done. Here the normal females scored themselves low and with no significant differences taking place between high cue and low cue female normals across all three concepts. While there was no significant difference between each pair of high and low cue male normal scores for each self-concept, there was a sharp increase in the normal weight male groups' Ideal Me scores over the other two self-concept scores. Thus, the scores of normal weight males accounted for all the significance in the increase of normal Ideal Me scores over normal Me and normal Public Me scores (figure 6; table 12).

Now it would appear that the feelings about potency were more complicated than indicated in the sex x repetition analysis. These feelings did not differ much for male obese across all three self-concepts. These two groups, the high and low cue obese males, rated themselves relatively high on this dimension personally, publicly, and ideally. The two obese female groups, on the other hand, rated

themselves highly on potency personally and publicly, but certainly wished they were significantly less potent. The situation was inverted for the normal groups with the females rating themselves low on potency across all three concepts and the males scoring themselves low personally and publicly but ideally wanting to be more potent. These results suggest strongly there were strong sex differences as a function of weight in the direction of the ideal positive valance of potency. These striking differences merit further investigation.

The analysis of variance of activity scores (tables 15 and 16) resulted in only repetition being found significant ($p < .001$). As graphed in figure 39, when all subjects were pooled they tended to see themselves as being as active as others saw them, but ideally they wished to be more active insofar as activity was defined by the bipolar scales used.

As seen in figure 8 and tables 17 and 18, the pattern of sex x weight x cue x repetition scores along the activity dimension differed markedly from that for the potency dimension but was the same as the pattern of the same interaction along the evaluative dimension. That it, the activity Personal Self and Public Self scores were essentially the same while the Ideal Self score was significantly higher. When comparisons were made between obese males and obese females (table 17) only two of the 18 comparisons were significant. The low cue obese males saw themselves, personally, as significantly more active ($p < .01$) than did the high cue female obese. The low cue obese males also rated their Public Selves significantly higher ($p < .05$) than did the high cue female obese. None of the 18 comparisons between normal weight females and males (table 18) were significant.

The only notable difference between the evaluative and activity dimensions was that the three self-concept scores of the evaluative dimension (figure 3) were each higher than the respective score along the activity dimension (figure 8). For both these dimensions, if the Ideal Me was assumed to represent the most positive self-concept, then a higher score was more positive since the Ideal Self was consistently rated higher than the Personal and Public Self by all the experimental groups. The pattern of the potency self-concept scores (figure 7) was not only much different from the patterns of the other two dimensions, but the potency self-concept scores also tended to be lower than those of the activity and evaluative dimensions. Not only was potency rated the least positively of the three dimensions, but the meaning and direction of "positive" differed as a function of the interaction of gender and weight within the potency dimension.

Summing the evaluative, potency and activity scores resulted in a total score. The analysis of variance (tables 19 and 20) produced weight as a significant ($p < .001$) main effect where the obese rated themselves higher than did the normal weight subjects (figure 9). Repetition (figure 40) was also significant ($p < .001$). Although the pooled subjects rated their Personal and Public Selves the same, they scored their Ideal Selves significantly higher. When the significant ($p < .001$) sex x repetition interaction was examined (figure 41; table 61) there was no significant difference between self-ratings of males and females for the personal and public self-concepts, but both males and females scored their Ideal Selves significantly higher ($p < .001$ for each). There was a sex difference here, however, because the male group scored its Ideal Self significantly higher ($p < .001$) than did the female group.

The fourth significant ($p < .001$) source was the weight x repetition interaction effect (figure 10; table 21). Here the reverse of the sex x repetition pattern occurred. The obese rated both their Personal and Public Selves approximately the same but significantly higher than did the normals with each difference significant at better than the .001 level. Both the obese and the normals significantly ($p < .001$) increased their respective Ideal Self ratings, however, the normal Ideal Self score increased about twice as much as did the obese rating with the result that the difference between the two was no longer significant.

Thus, the total Semantic Differential scores presented a deceptive image of the self-concepts of males, females, obese, and normals. The higher total scores across all three self-concepts, coupled with the significant Ideal Self increase over the Personal and Public Self ratings, seemed to indicate that the obese had a more positive self image than normals (figure 10) but previous results discussed in relation to the potency dimension made clear that along certain scales the obese wanted to be less potent, e.g. lighter and smaller (see Appendix: figures 29, 30, 35, and 36). Their personal and public self-concepts along the potency dimension were <u>higher</u> but experienced as <u>negative</u> and <u>less desirable</u>. Similarly, the total score sex x repetition interaction (figure 41), because of the significant increase in the Ideal Me score for both males and females, seemed to suggest that higher score and positive were synonymous. It will be recalled that the statistical analysis of the potency dimension scores revealed that only for both the high and low cue normal weight males were the Ideal Self scores higher than the scores for the Personal and Public Selves. All the

obese males and females wanted to be lighter and smaller and both the low and high cue normal females wanted to be lighter. Again, Personal and Public Selves along the potency dimension were higher but experienced as negative.

Although the interaction effect of sex x weight x cue x repetition was not significant, an examination of figure 11 shows the effect on the total scores of the significant but hidden decrease along the potency dimension of the Ideal Me ratings for the low and high cue female obese groups previously seen in figure 7. The rate of increase for these groups in total Ideal Me scores over Me and Public Me scores was significantly less than fo- all the other six groups.

FIGURE 29.

Low Cue Male Obese: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

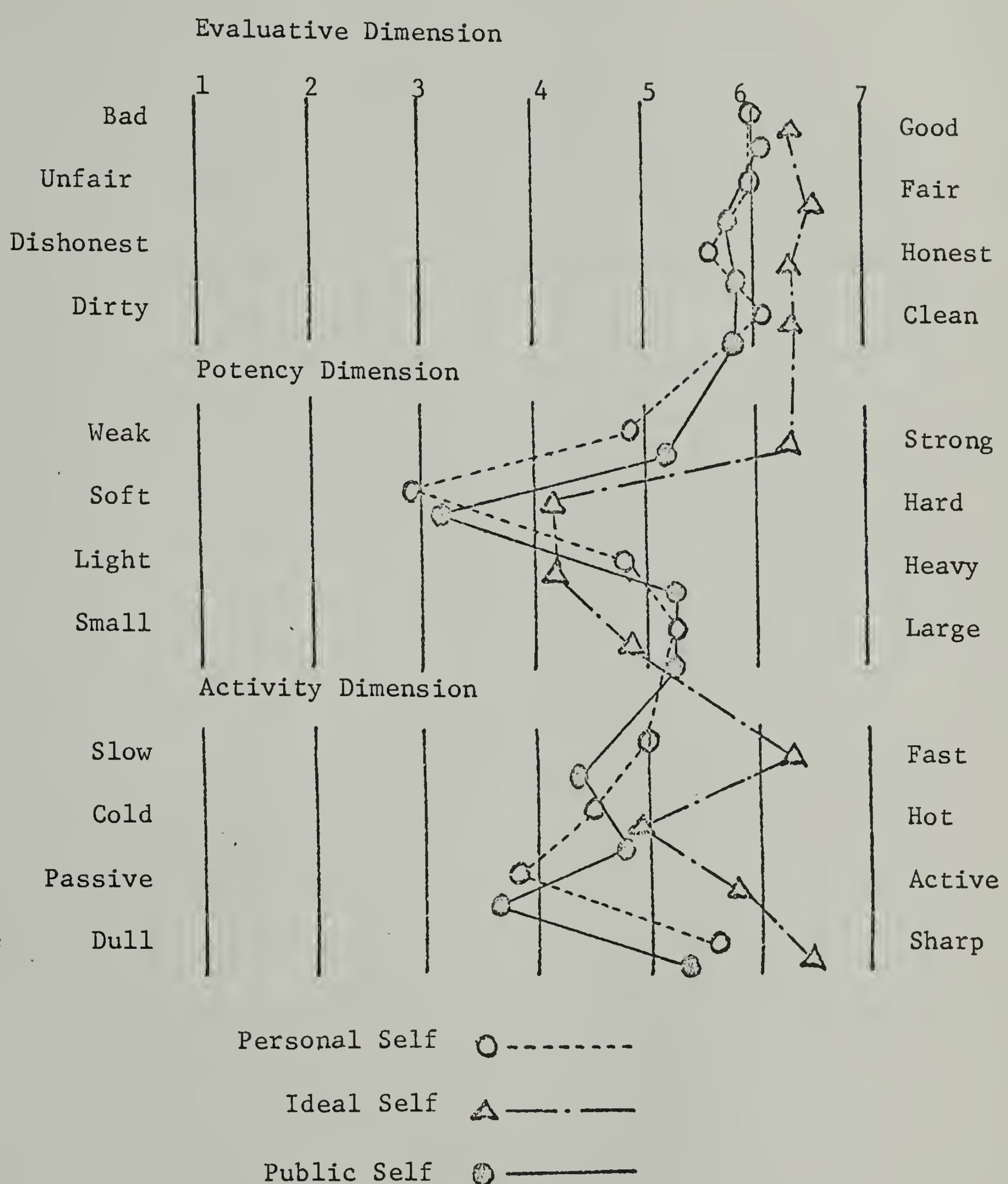


TABLE 53.

Low Cue Male Obese: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

Evaluative Dimension

	Personal Self	Ideal Self	Public Self	
Bad	6.00	6.43	6.07	Good
Unfair	6.00	6.57	5.79	Fair
Dishonest	5.57	6.29	5.86	Honest
Dirty	6.07	6.36	5.79	Clean

Potency Dimension

	Personal Self	Ideal Self	Public Self	
Weak	4.93	6.36	5.14	Strong
Soft	3.00	4.21	3.21	Hard
Light	4.79	4.21	5.29	Heavy
Small	5.29	4.93	5.29	Large

Activity Dimension

	Personal Self	Ideal Self	Public Self	
Slow	5.00	6.43	4.43	Fast
Cold	4.50	5.00	4.79	Hot
Passive	3.86	5.86	3.64	Active
Dull	5.57	6.50	5.29	Sharp

FIGURE 30.

High Cue Male Obese: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

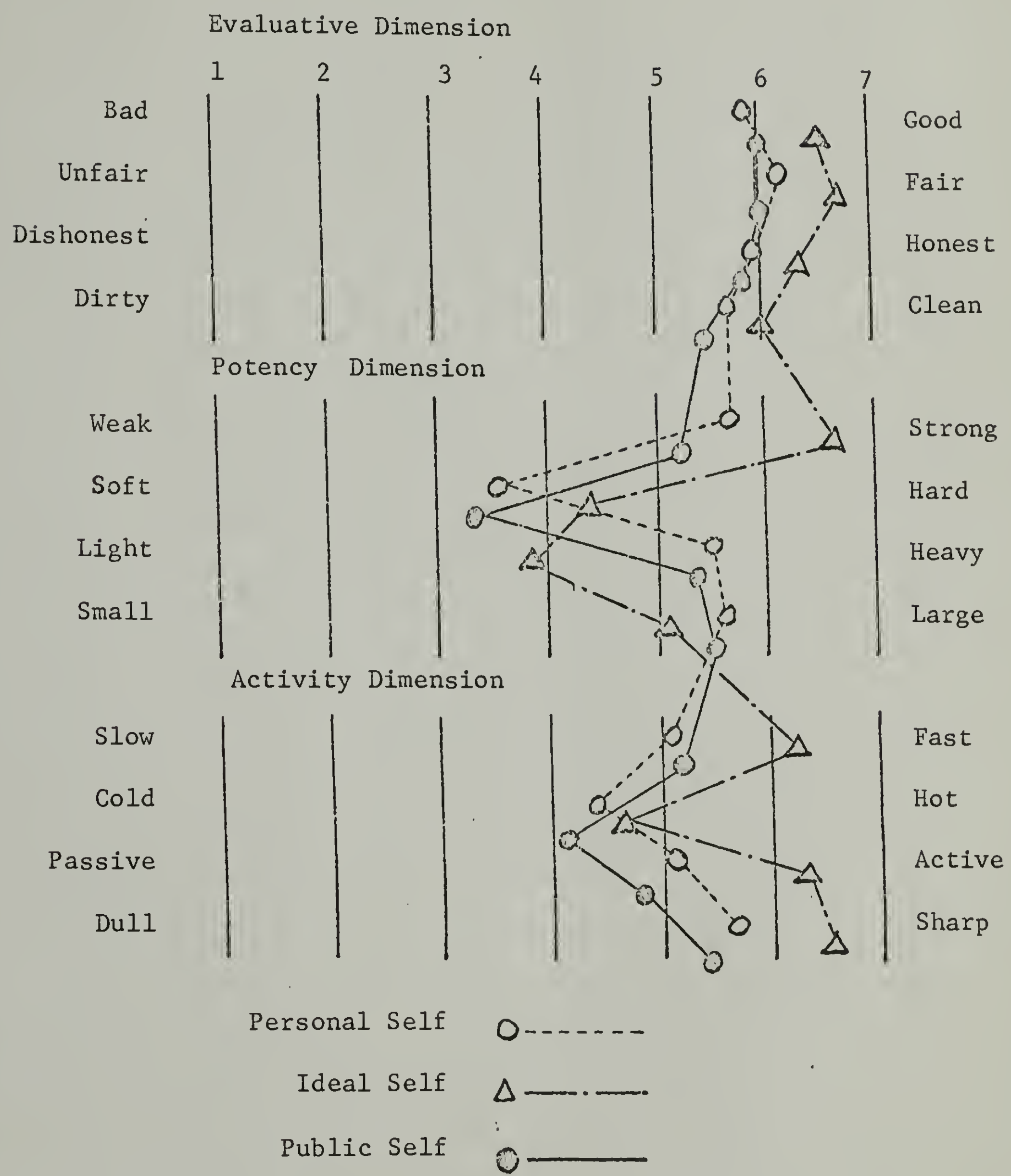


TABLE 54.

High Cue Male Obese: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

Evaluative Dimension

	Personal Self	Ideal Self	Public Self	
Bad	5.86	6.50	6.00	Good
Unfair	6.14	6.64	6.00	Fair
Dishonest	5.93	6.36	5.86	Honest
Dirty	5.64	6.00	5.43	Clean

Potency Dimension

Weak	5.71	6.64	5.21	Strong
Soft	3.57	4.36	3.36	Hard
Light	5.50	3.93	5.36	Heavy
Small	5.64	5.07	5.57	Large

Activity Dimension

Slow	5.07	6.29	5.14	Fast
Cold	4.43	4.64	4.14	Hot
Passive	5.07	6.36	4.86	Active
Dull	5.71	6.64	5.43	Sharp

FIGURE 31.

Low Cue Male Normal: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

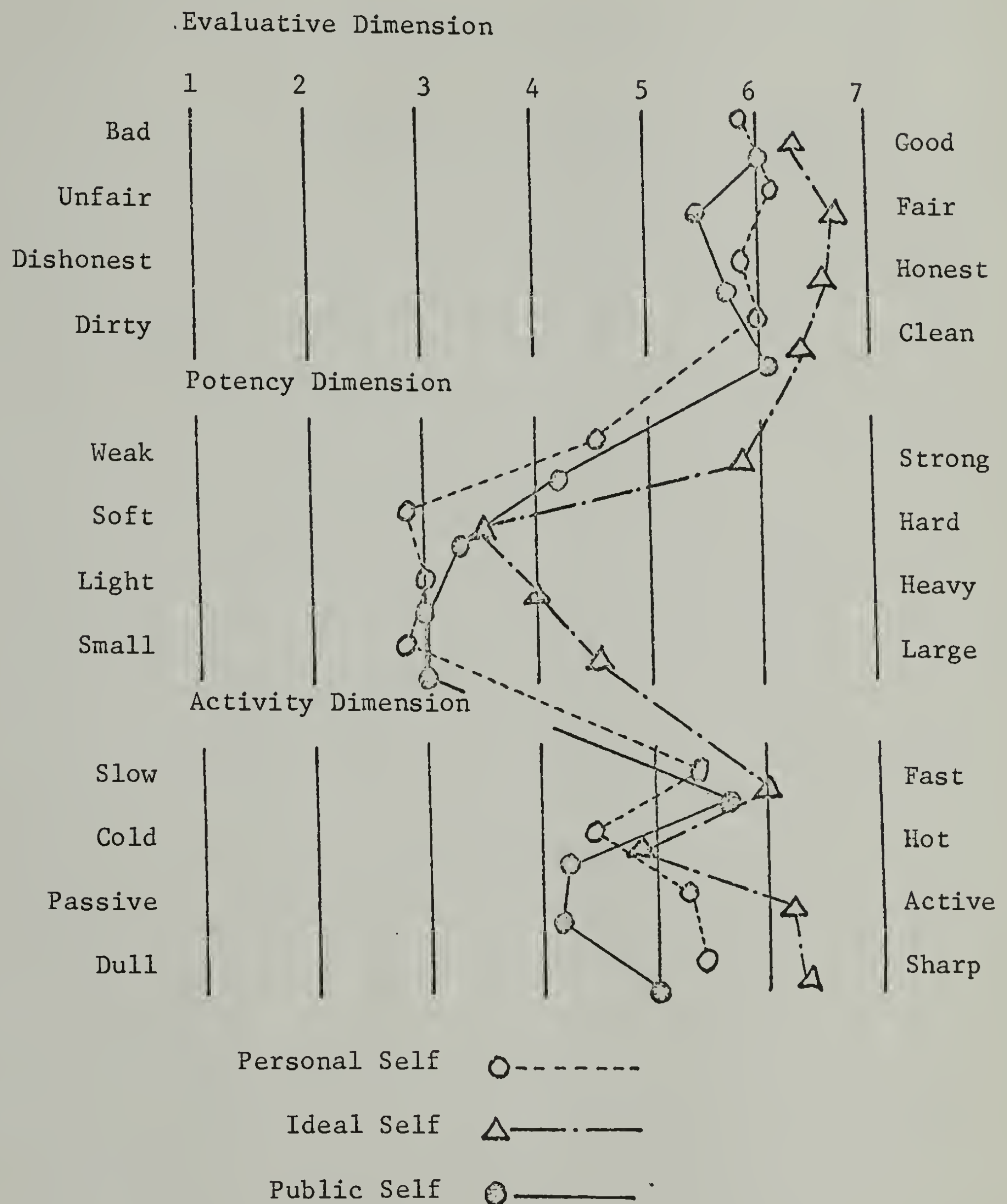


TABLE 55.

Low Cue Male Normal: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

Evaluative Dimension

	Personal Self	Ideal Self	Public Self	
Bad	5.86	6.29	6.00	Good
Unfair	6.07	6.71	5.43	Fair
Dishonest	5.79	6.57	5.71	Honest
Dirty	6.00	6.36	6.07	Clean

Potency Dimension

Weak	4.50	5.86	4.21	Strong
Soft	2.86	3.50	3.29	Hard
Light	3.00	4.00	3.00	Heavy
Small	2.79	4.50	3.00	Large

Activity Dimension

Slow	5.36	6.00	5.57	Fast
Cold	4.43	4.79	4.21	Hot
Passive	5.21	6.14	4.14	Active
Dull	5.36	6.36	5.00	Sharp

FIGURE 32.

High Cue Male Normal: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

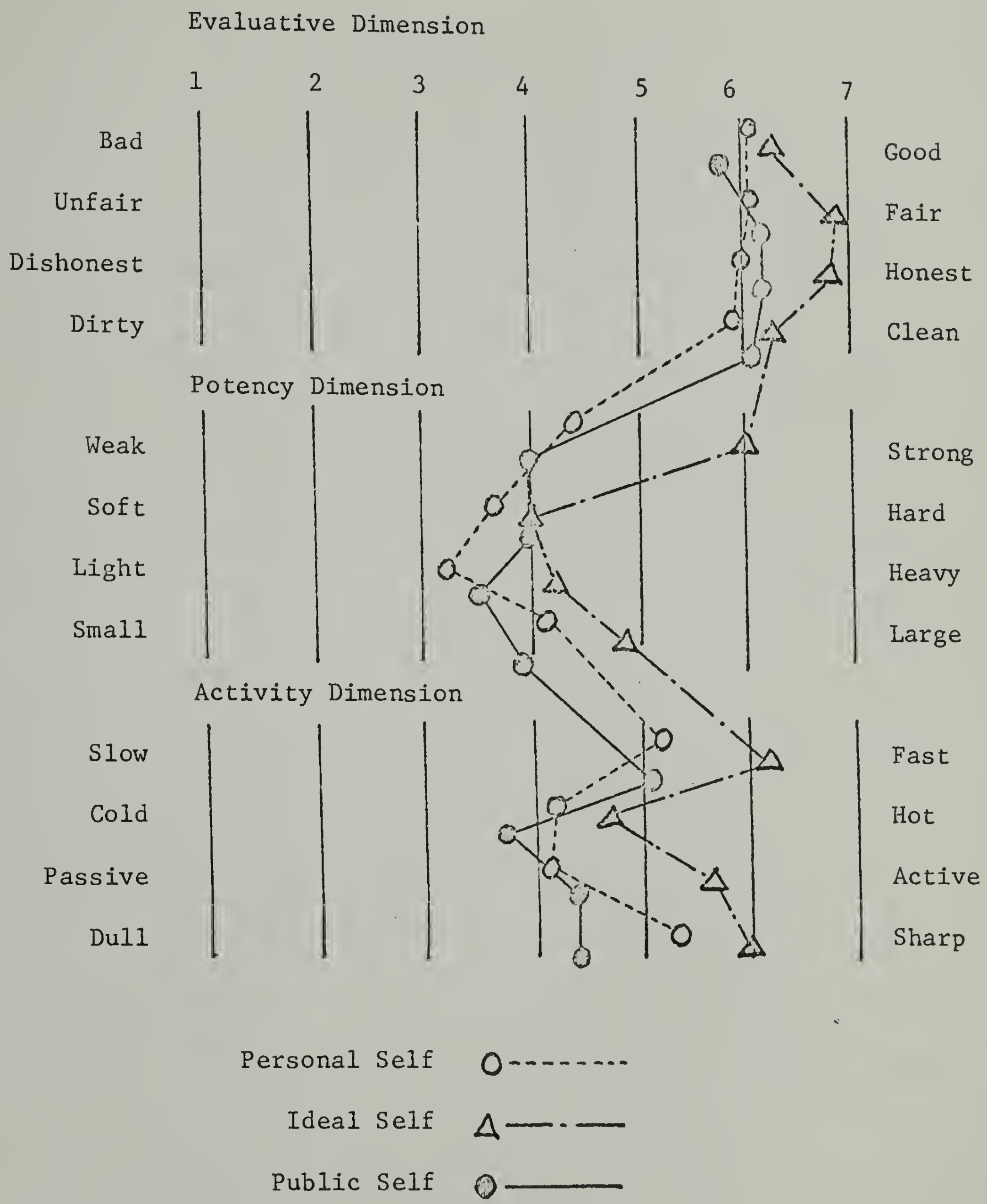


TABLE 56.

High Cue Male Normal: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

Evaluative Dimension

	Personal Self	Ideal Self	Public Self	
Bad	6.07	6.29	5.82	Good
Unfair	6.07	6.93	6.14	Fair
Dishonest	6.00	6.86	6.14	Honest
Dirty	5.93	6.21	6.07	Clean

Potency Dimension

	Personal Self	Ideal Self	Public Self	
Weak	4.43	6.00	4.00	Strong
Soft	3.64	4.00	4.00	Hard
Light	3.21	4.21	3.50	Heavy
Small	4.07	4.93	3.93	Large

Activity Dimension

	Personal Self	Ideal Self	Public Self	
Slow	5.21	6.21	5.07	Fast
Cold	4.21	4.71	3.79	Hot
Passive	4.14	5.64	4.43	Active
Dull	5.29	6.00	4.43	Sharp

FIGURE 33.

Low Cue Female Normal: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

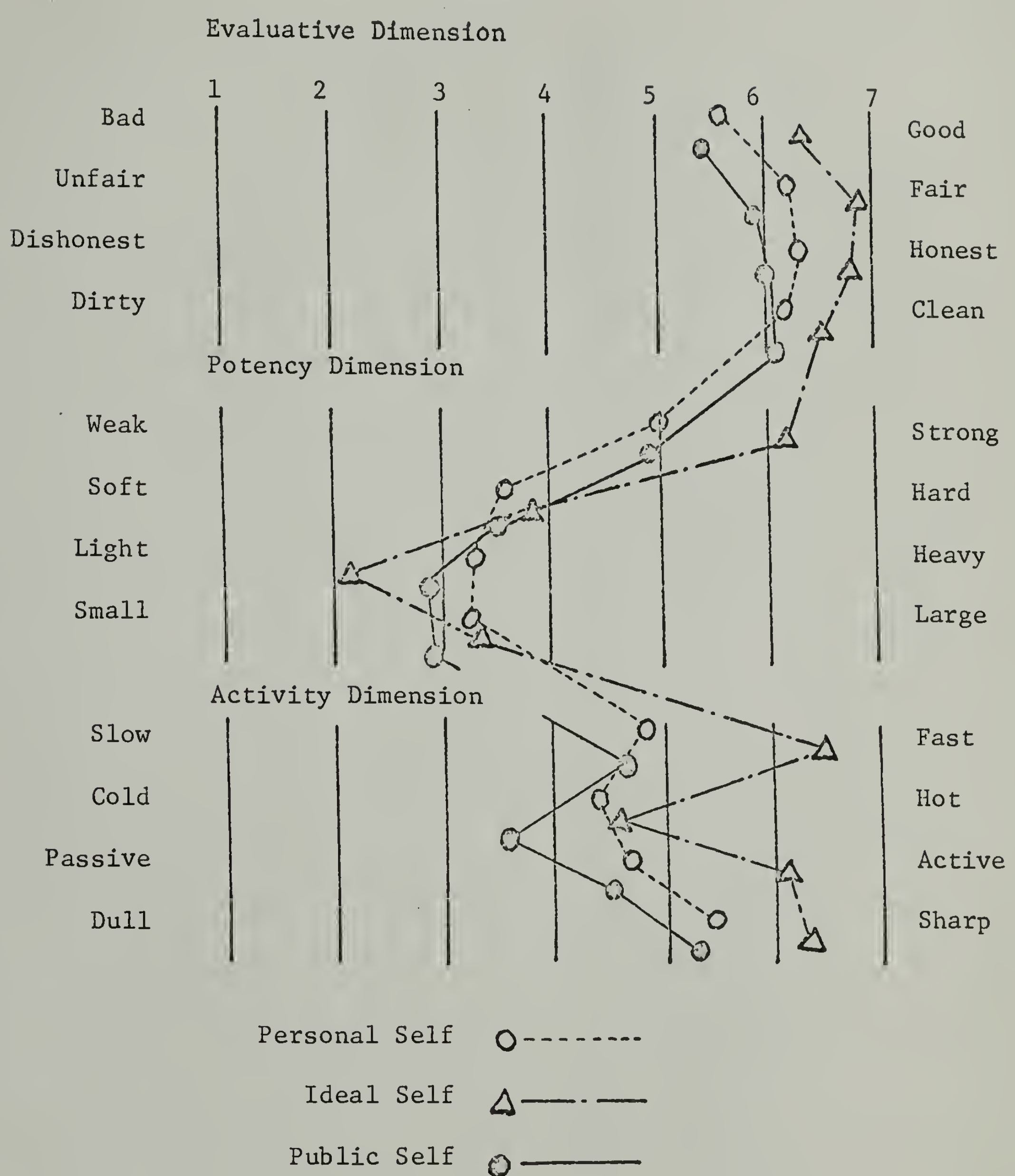


TABLE 57.

Low Cue Female Normal: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

	Personal Self	Ideal Self	Public Self	
	Evaluative Dimension			
Bad	5.64	6.36	5.43	Good
Unfair	6.21	6.93	5.93	Fair
Dishonest	6.29	6.86	6.00	Honest
Dirty	6.21	6.57	6.14	Clean
	Potency Dimension			
Weak	5.00	6.21	4.93	Strong
Soft	3.57	3.86	3.50	Hard
Light	3.29	2.14	2.93	Heavy
Small	3.29	3.36	2.93	Large
	Activity Dimension			
Slow	4.86	6.50	4.71	Fast
Cold	4.43	4.57	3.64	Hot
Passive	4.64	6.07	4.50	Active
Dull	5.43	6.36	5.36	Sharp

FIGURE 34.

High Cue Female Normal: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

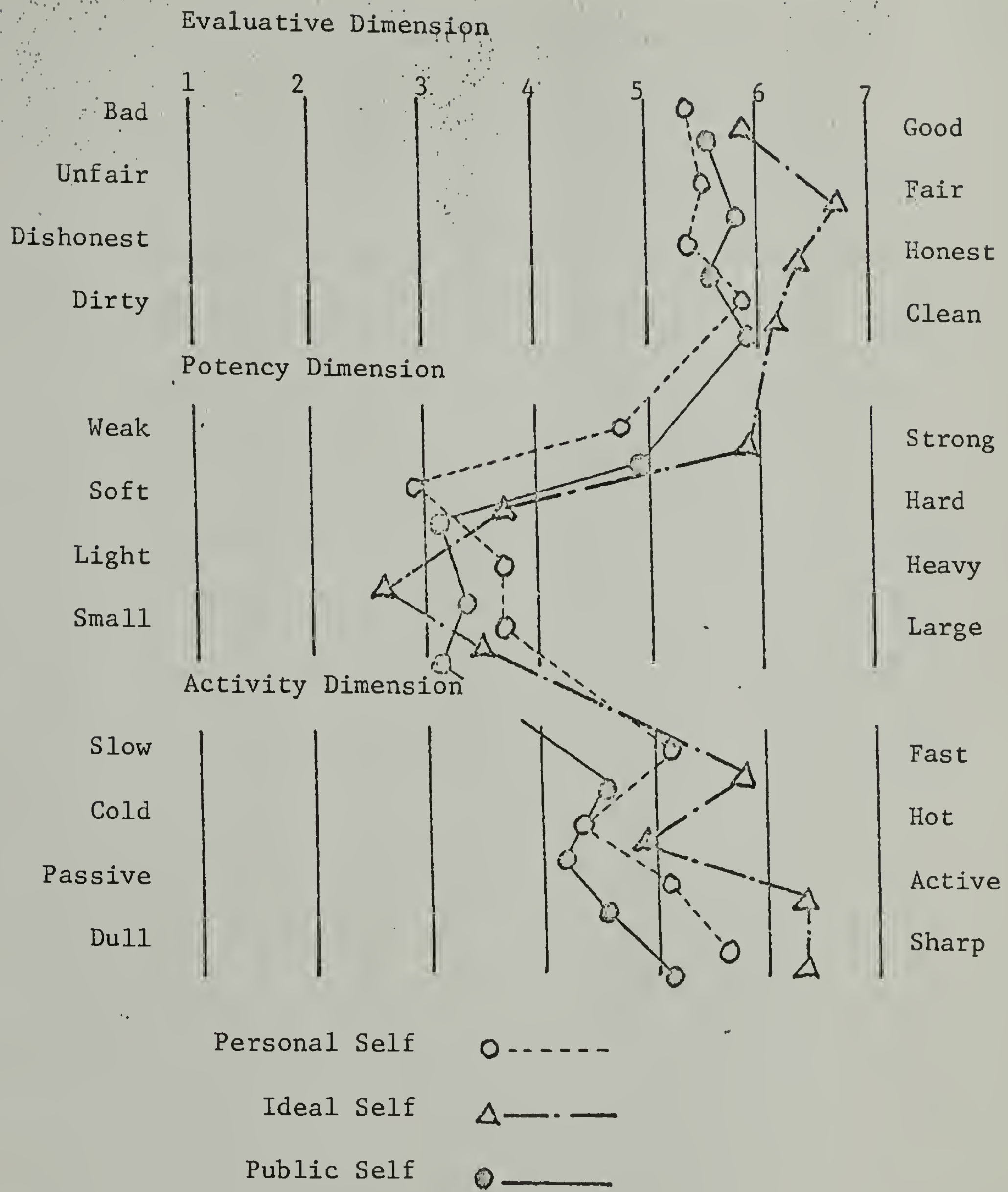


TABLE 58.

High Cue Female Normal: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

Evaluative Dimension

	Personal Self	Ideal Self	Public Self	
Bad	5.29	5.93	5.50	Good
Unfair	5.50	6.79	5.79	Fair
Dishonest	5.36	6.36	5.57	Honest
Dirty	5.86	6.14	5.86	Clean

Potency Dimension

Weak	4.71	5.93	4.93	Strong
Soft	2.93	3.64	3.07	Hard
Light	3.71	2.64	3.36	Heavy
Small	3.64	3.50	3.14	Large

Activity Dimension

Slow	5.14	5.86	4.57	Fast
Cold	4.29	4.93	4.21	Hot
Passive	5.07	6.36	4.57	Active
Dull	5.64	6.29	5.14	Sharp

FIGURE 35.

Low Cue Female Obese Group: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

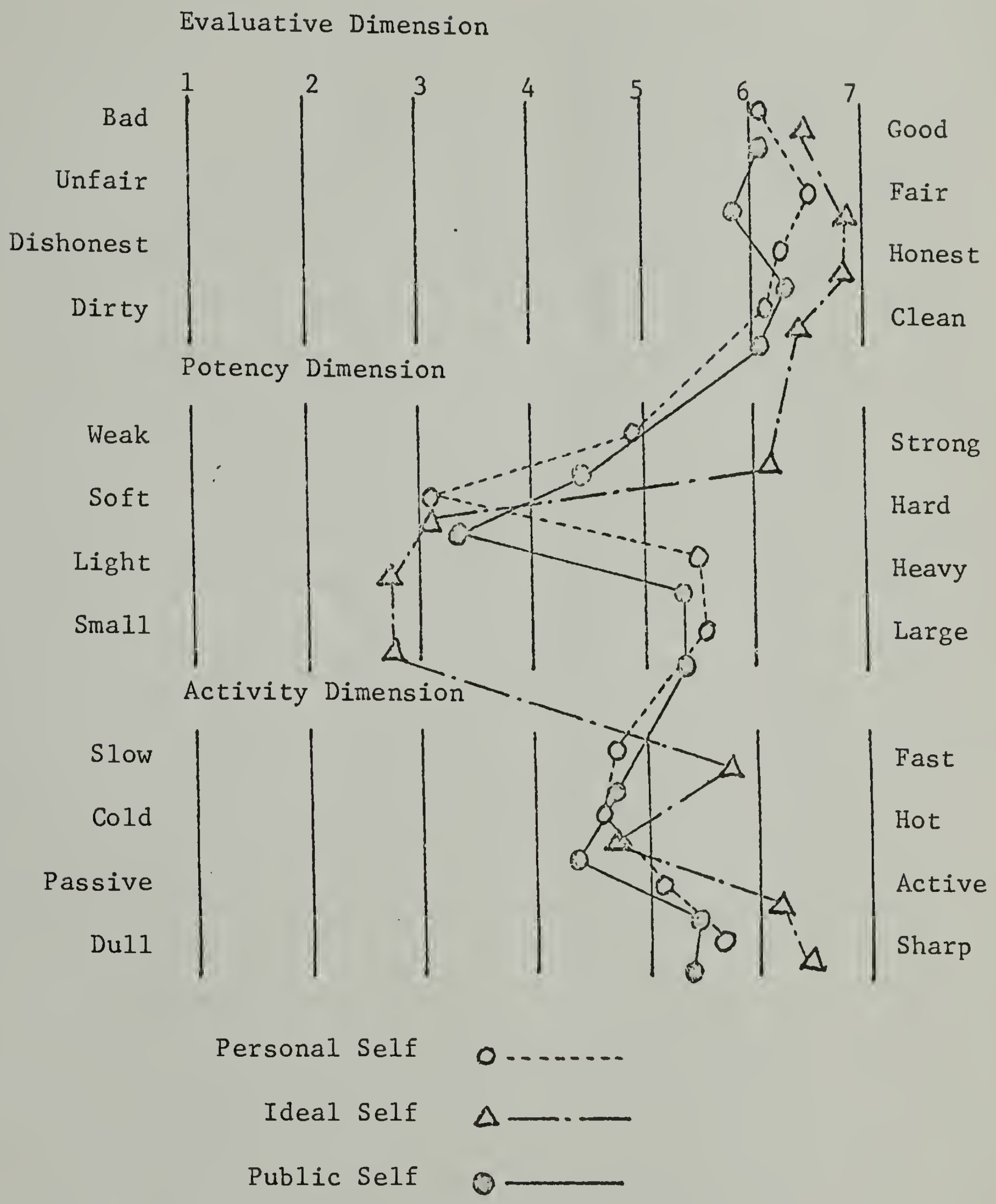


TABLE 59.

Low Cue Female Obese Group: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

Evaluative Dimension

	Personal Self	Ideal Self	Public Self	
Bad	6.07	6.50	6.00	Good
Unfair	6.50	6.93	5.86	Fair
Dishonest	6.29	6.79	6.36	Honest
Dirty	6.14	6.43	6.07	Clean

Potency Dimension

	Personal Self	Ideal Self	Public Self	
Weak	4.93	6.21	4.43	Strong
Soft	3.07	3.07	3.36	Hard
Light	5.50	2.71	5.29	Heavy
Small	5.57	2.79	5.36	Large

Activity Dimension

	Personal Self	Ideal Self	Public Self	
Slow	4.71	5.79	4.71	Fast
Cold	4.57	4.64	4.36	Hot
Passive	5.14	6.21	5.43	Active
Dull	5.57	6.43	5.36	Sharp

FIGURE 36.

High Cue Female Obese Group: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

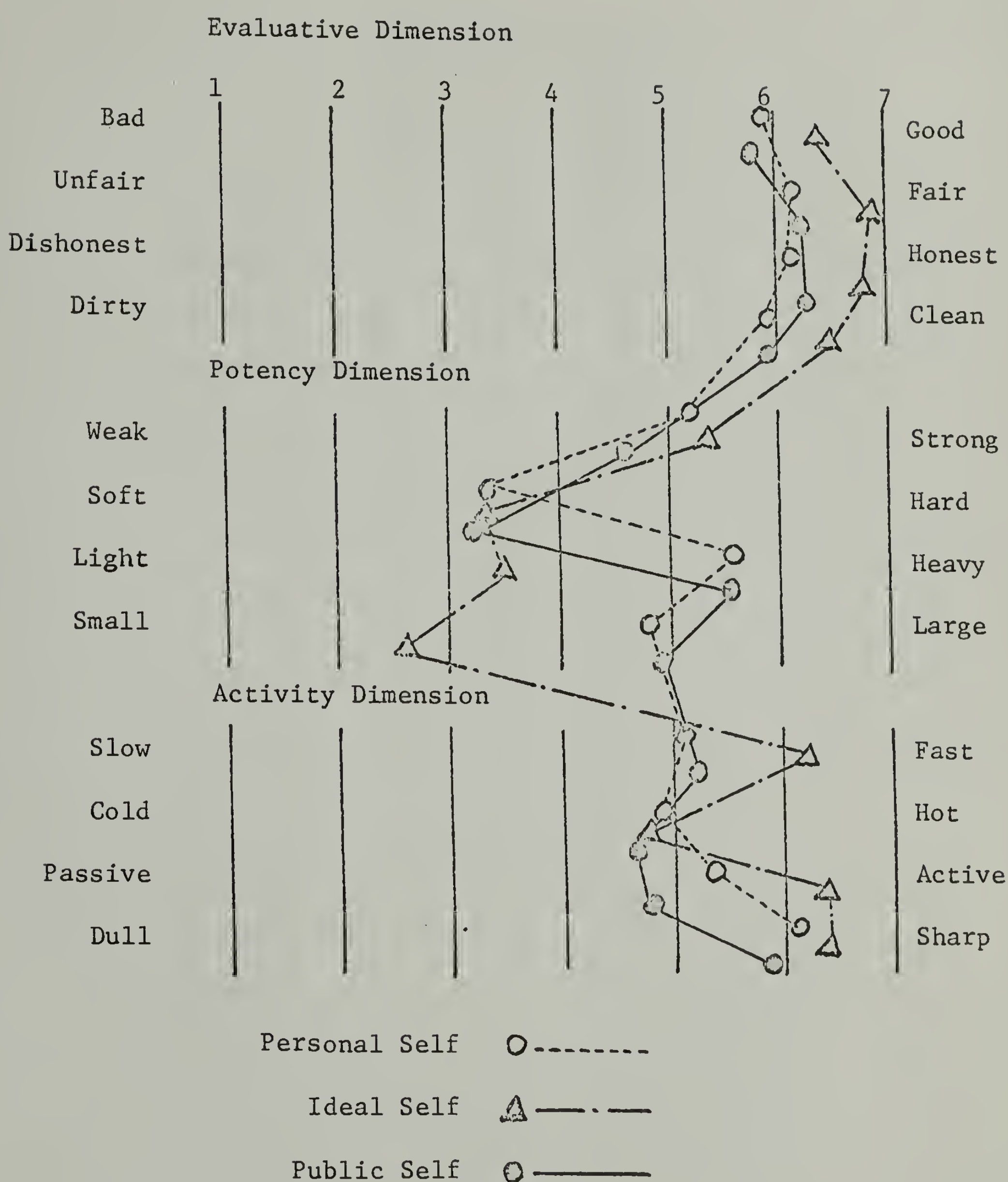


TABLE 60.

High Cue Female Obese Group: Cell Means of the Bipolar Adjective Scales of the Semantic Differential.

	Personal Self	Ideal Self	Public Self	
	Evaluative Dimension			
Bad	5.86	6.36	5.71	Good
Unfair	6.00	6.93	6.14	Fair
Dishonest	6.00	6.79	6.14	Honest
Dirty	5.93	6.50	5.93	Clean
	Potency Dimension			
Weak	5.14	5.36	4.57	Strong
Soft	3.29	3.29	3.07	Hard
Light	5.57	3.43	5.57	Heavy
Small	4.79	2.57	4.93	Large
	Activity Dimension			
Slow	5.00	6.21	5.07	Fast
Cold	4.93	4.79	4.57	Hot
Passive	5.36	6.29	4.71	Active
Dull	6.00	6.43	5.86	Sharp

FIGURE 37.

Mean Evaluative Scores from the Semantic Differential as a Function of Repetition.

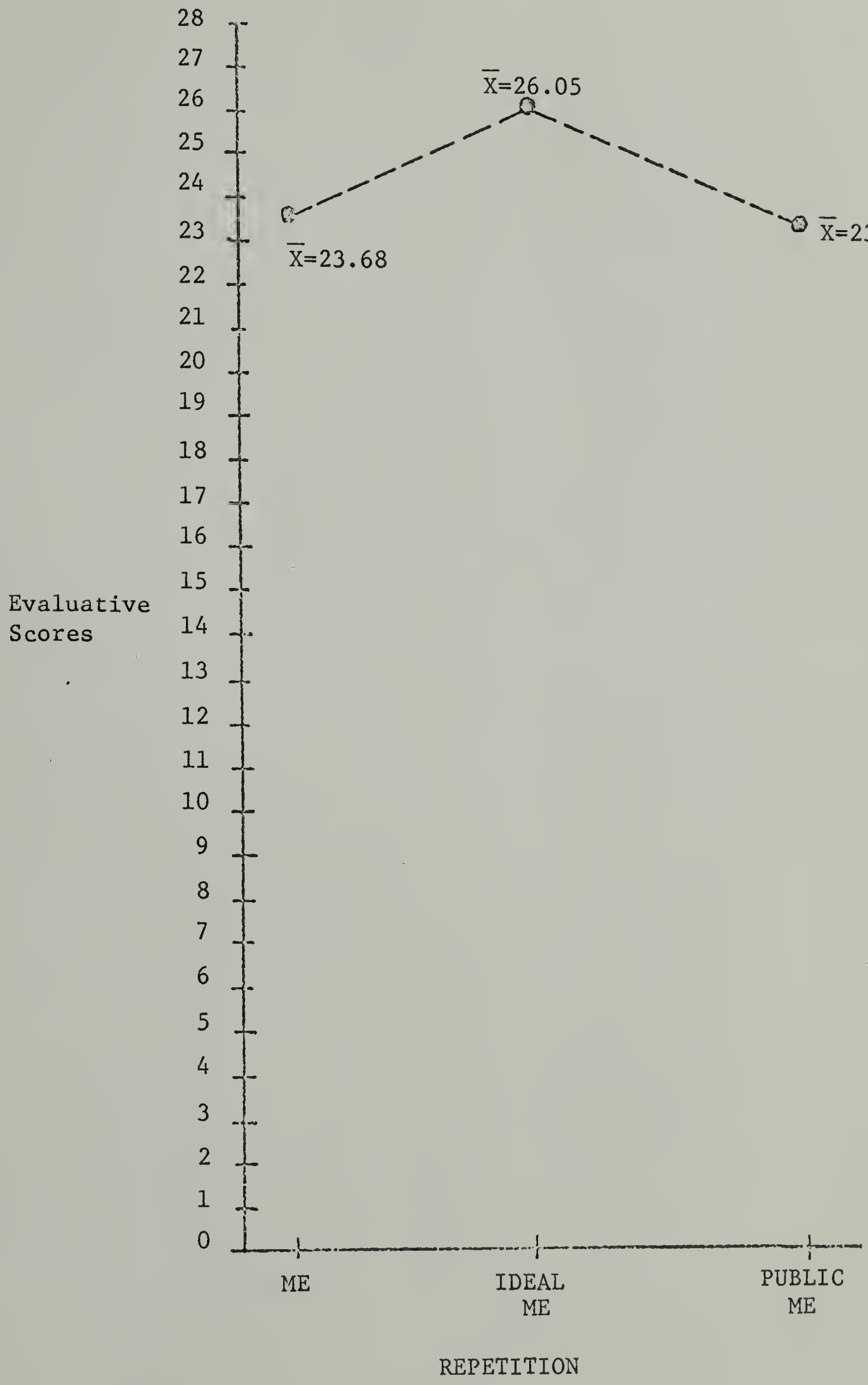


FIGURE 38.

Mean Potency Scores from the Semantic Differential as a Function of Gender.

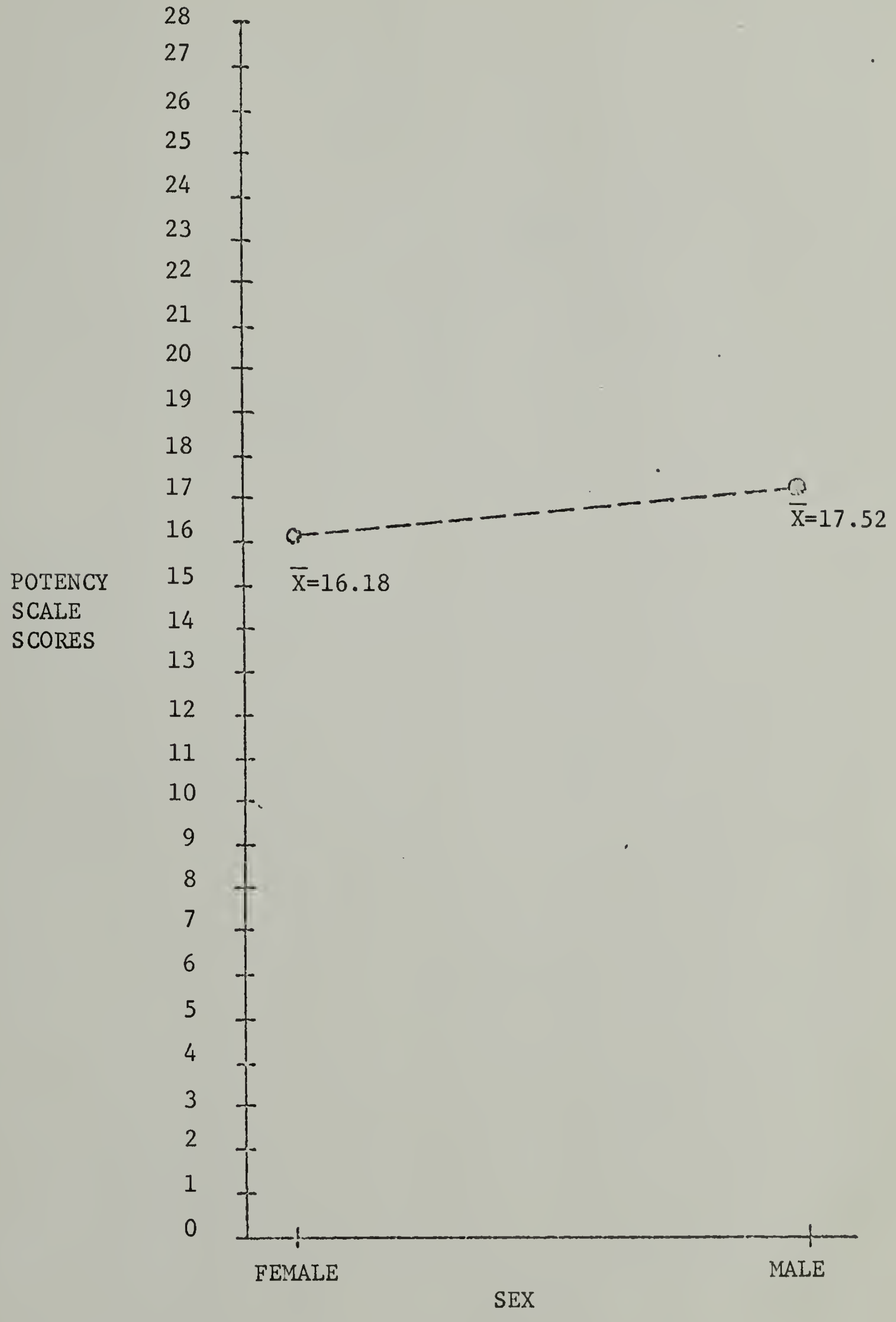


FIGURE 39.

Mean Activity Scores from the Semantic Differential as a Function of Repetition.

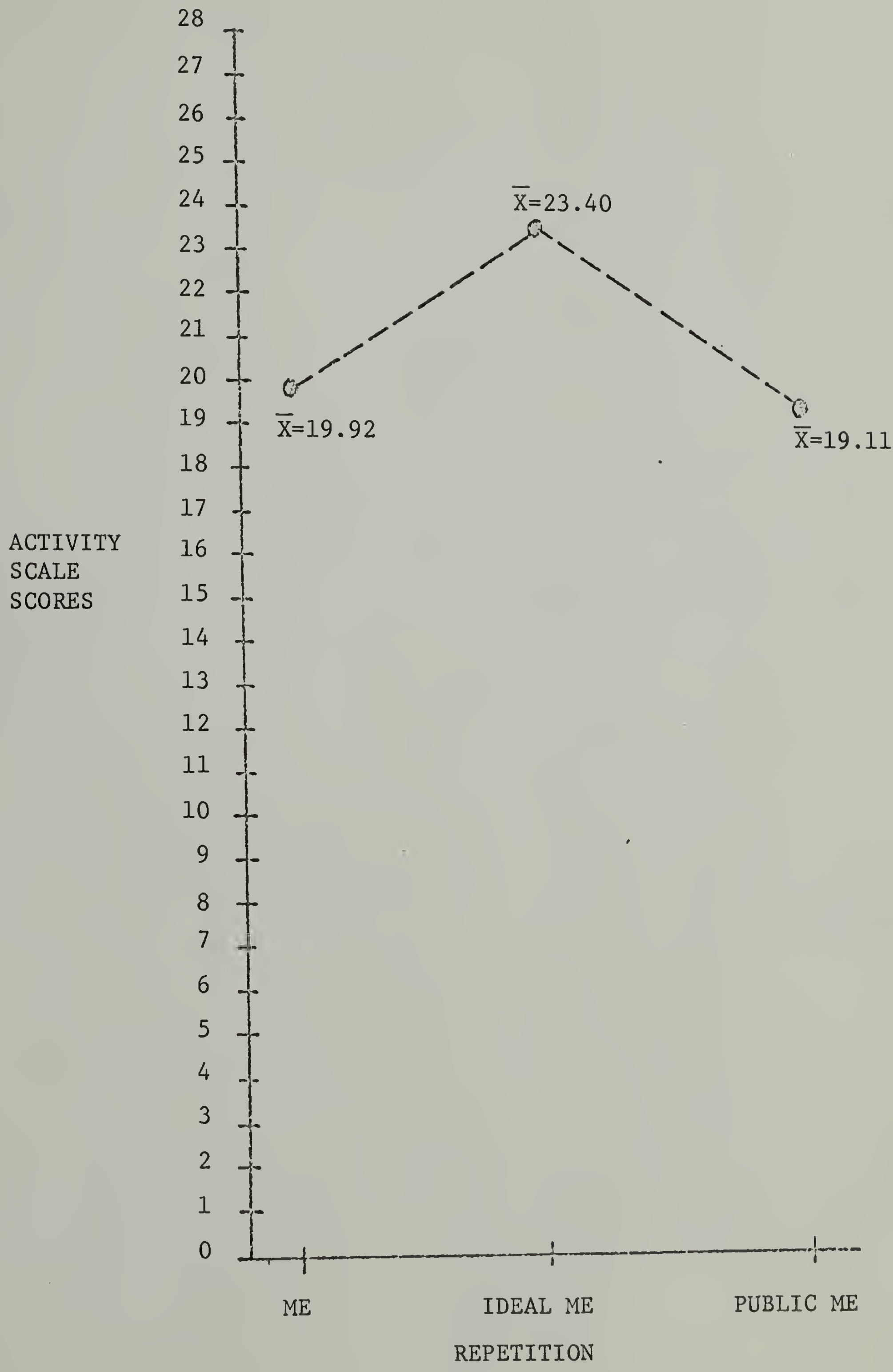


FIGURE 40.

Mean Total Semantic Differential Scores as a Function of Repetition.

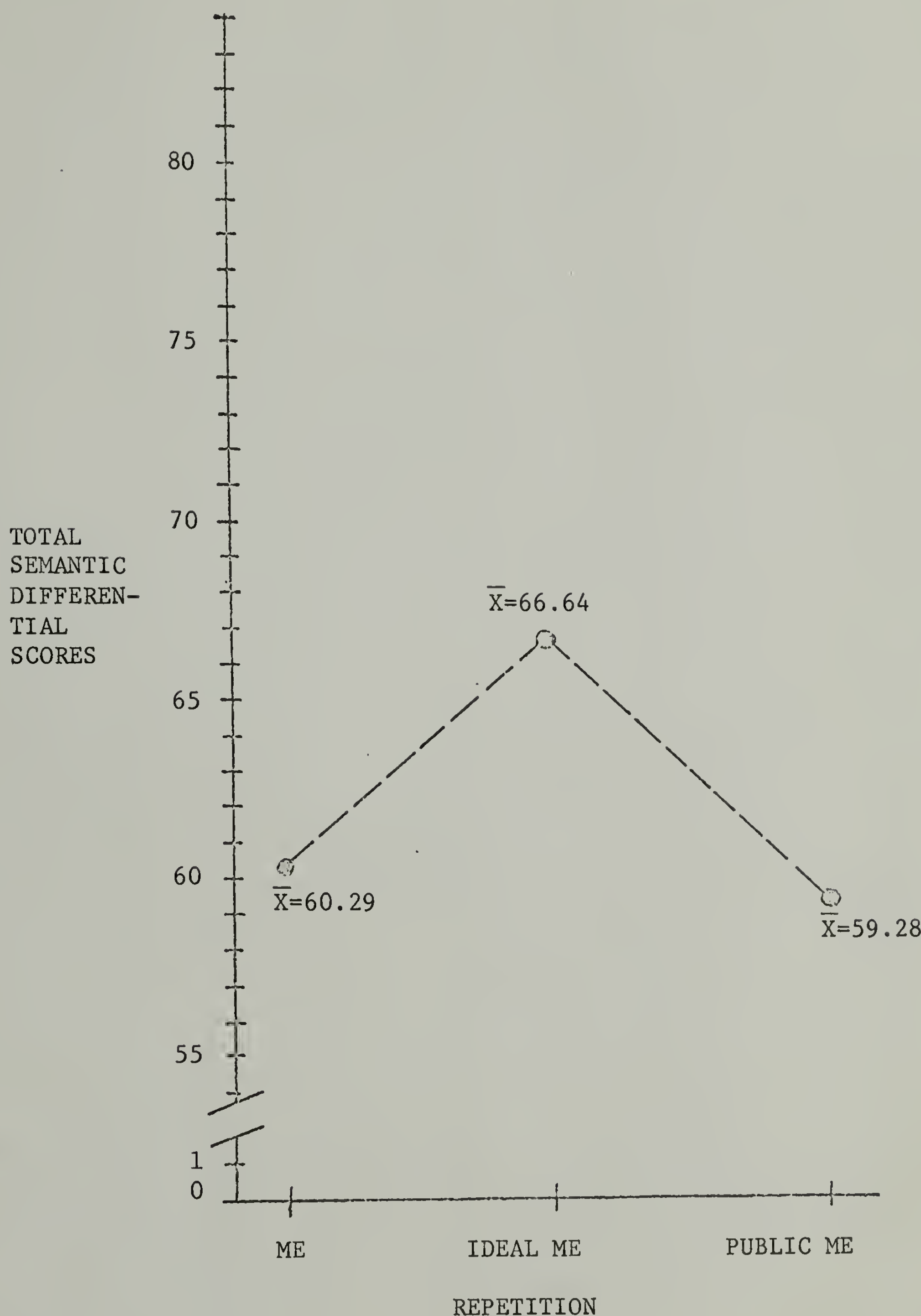


FIGURE 41.

Mean Total Semantic Differential Scores as a Function of the Interaction of Gender and Repetition.

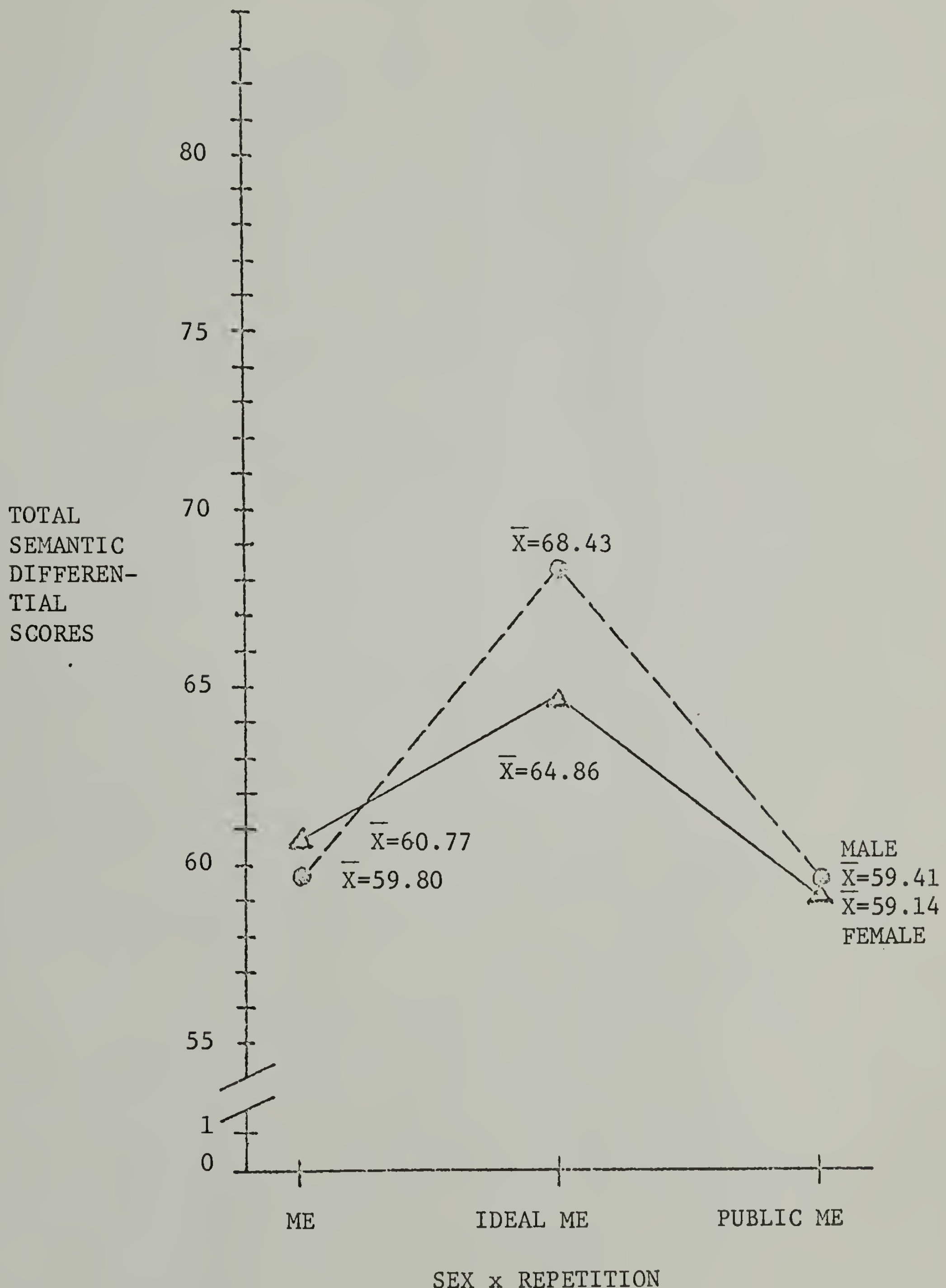


TABLE 61.

Semantic Differential Total Scores as a Function of the Interaction of Gender and Repetition: The Results of One Tail t-Tests (df=104) on the Difference between the Means.

	$\overline{X}_1-\overline{X}_2$	t	P
Male (Me) - Female (Me)			
	-0.9642	-0.9110	n.s.
Male (Ideal Me) - Female (Ideal Me)			
	3.5717	4.5285	<.001
Male (Public Me) - Female (Public Me)			
	0.2678	0.-239	n.s.
Female (Me) - Female (Ideal Me)			
	-4.0893	-4.5155	<.001
Female (Me) - Female (Public Me)			
	1.6250	1.5423	(<.10)
Female (Ideal Me) - Female (Public Me)			
	5.7143	6.0654	<.001
Male (Me) - Male (Ideal Me)			
	-8.6252	-9.0005	<.001
Male (Me) - Male (Public Me)			
	0.3930	0.3275	n.s.
Male (Ideal Me) - Male (Public Me)			
	9.0182	8.3734	<.001

TABLE 62.

Analysis of Variance of Rotter Scale Scores.

Source	df	MS	F	P
Sex	1	2.01	0.12	n.s.
Weight	1	8.58	0.53	n.s.
Cue	1	0.44	0.03	n.s.
Sex x Weight	1	0.08	0.00	n.s.
Sex x Cue	1	0.01	0.00	n.s.
Weight x Cue	1	6.51	0.40	n.s.
Sex x Weight x Cue	1	3.22	0.20	n.s.
Error (S/XWC)	104	16.23		

TABLE 63.

Cell Means and Standard Deviations of the Analysis of Variance of Rotter Scale Scores.

Source		Means (Standard Deviations)	
Sex		Female	Male
		10.89	11.16
Weight		Obese	Normal
		11.30	10.75
Cue		High	Low
		10.96	11.09
Sex x Weight		Obese	Normal
	Female	11.14	10.64
	Male	11.46	10.86
Sex x Cue		High	Low
	Female	10.82	10.96
	Male	11.11	11.21
Weight x Cue		High	Low
	Obese	11.00	11.61
	Normal	10.93	10.57
Sex x Weight x Cue		Female	
		High	Low
	Obese	11.00 (3.91)	11.29 (3.84)
	Normal	10.64 (3.58)	10.64 (4.51)
		Male	
	Obese	11.00 (3.09)	11.93 (4.59)
	Normal	11.21 (4.66)	10.50 (2.23)

SCREENING QUESTIONNAIRE

PLEASE PRINT YOUR ANSWERS

Name: ______________________________

Campus Address: ______________________

Campus Telephone Number: ________________

Female: ____

Male: ____

Age: ____

Weight: ____

Height: ______(feet)______(inches)

Are you a member of a university athletic team? Yes:____ No:____

If "yes", which team? ____________________

Were you a member of a high school athletic team? Yes:____ No:____

If "yes", which team? ____________________

SEMANTIC DIFFERENTIAL

INSTRUCTIONS

Please rate yourself on the series of two-word scales found on the next three pages. Here is how you use these scales:

1. Read the title of the page (for example: ME).

2. If you feel that the title at the top of the page is very closely related to one end of the scale, place your "X" mark as follows:

dishonest _X_:___:___:___:___:___:___honest

OR

dishonest ___:___:___:___:___:___:_X_honest

3. If you feel that the title is quite closely related to one or the other end of the scale (but not extremely), place your "X" mark as follows:

dishonest ___:_X_:___:___:___:___:___honest

OR

dishonest ___:___:___:___:___:_X_:___honest

4. If the title seems only slightly related to one side as opposed to the other side (but is not really neutral), put an "X" as follows:

dishonest ___:___:_X_:___:___:___:___honest

OR

dishonest ___:___:___:___:_X_:___:___honest

The direction toward which you "X", of course, depends upon which of the two ends of the scale seems most characteristic of the thing you are judging.

5. If you consider the title to be neutral on the scale, both sides of the scale equally associated with the title, or if the scale is completely unrelated to the title, then place your "X" mark in the middle space:

dishonest ___:___:___:_X_:___:___:___honest

6. IMPORTANT: (a) Place the "X" mark in the middle of the space, not on the boundaries:

NOT THIS

THIS X

dishonest ___:_X_:___:___:___:___:___honest

(b) Be sure to put an "X" between each pair of words under each title. DO NOT LEAVE OUT ANY.

(c) Never put more than one "X" between each pair of words.

7. Do not look back and forth between the items.

Do not try to remember how you marked similar items under different titles.

Judge each item only as you feel it relates to the title at the top of the page.

Do not worry or puzzle over individual items.

It is your first impressions, the immediate "feelings" about the items, which are important. On the other hand, please do not be careless, because it is your true impressions that count.

8. Please turn the page and start now.

ME

good ___:___:___:___:___:___:___bad

fast ___:___:___:___:___:___:___slow

unfair ___:___:___:___:___:___:___fair

hot ___:___:___:___:___:___:___cold

weak ___:___:___:___:___:___:___strong

hard ___:___:___:___:___:___:___soft

passive ___:___:___:___:___:___:___active

dishonest ___:___:___:___:___:___:___honest

heavy ___:___:___:___:___:___:___light

clean ___:___:___:___:___:___:___dirty

sharp ___:___:___:___:___:___:___dull

small ___:___:___:___:___:___:___large

ME AS I WOULD LIKE TO BE

good___:___:___:___:___:___:___bad

fast___:___:___:___:___:___:___slow

unfair___:___:___:___:___:___:___fair

hot___:___:___:___:___:___:___cold

weak___:___:___:___:___:___:___strong

hard___:___:___:___:___:___:___soft

passive___:___:___:___:___:___:___active

dishonest___:___:___:___:___:___:___honest

heavy___:___:___:___:___:___:___light

clean___:___:___:___:___:___:___dirty

sharp___:___:___:___:___:___:___dull

small___:___:___:___:___:___:___large

AS OTHER PEOPLE SEE ME

good___:___:___:___:___:___:___bad

fast___:___:___:___:___:___:___slow

unfair___:___:___:___:___:___:___fair

hot___:___:___:___:___:___:___cold

weak___:___:___:___:___:___:___strong

hard___:___:___:___:___:___:___soft

passive___:___:___:___:___:___:___active

dishonest___:___:___:___:___:___:___honest

heavy___:___:___:___:___:___:___light

clean___:___:___:___:___:___:___dirty

sharp___:___:___:___:___:___:___dull

small___:___:___:___:___:___:___large

KEY FOR SCORING THE SEMANTIC DIFFERENTIAL

Evaluative Dimension

good _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ bad

unfair _1_ : _2_ : _3_ : _4_ : _5_ : _6_ : _7_ fair

dishonest _1_ : _2_ : _3_ : _4_ : _5_ : _6_ : _7_ honest

clean _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ dirty

Potency Dimension

weak _1_ : _2_ : _3_ : _4_ : _5_ : _6_ : _7_ strong

hard _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ soft

heavy _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ light

small _1_ : _2_ : _3_ : _4_ : _5_ : _6_ : _7_ large

Activity Dimension

fast _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ slow

hot _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ cold

passive _1_ : _2_ : _3_ : _4_ : _5_ : _6_ : _7_ active

sharp _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ dull

ANXIETY-DEPRESSION SCALE

This questionnaire consists of numbered statements. Read each statement and decide whether it is <u>true as applied to you or false as applied to you</u>. If it is TRUE or MOSTLY TURE, blacken the T to the left of the statement you are answering. If the statement is NOT USUALLY TRUE or is NOT TRUE AT ALL, blacken the F. Give your own opinion of yourself. Do not leave any blank spaces if you can avoid it. Try to make some answer to every statement.

T F 1. My daily life is full of things that keep me interested.

T F 2. I am easily awakened by noise.

T F 3. I believe I am no more nervous than most others.

T F 4. At times I feel like smashing things.

T F 5. I work under a great deal of tension.

T F 6. My judgment is better than it ever was.

T F 7. I cannot keep my mind on one thing.

T F 8. I am a good mixer.

T F 9. I am more sensitive than most other people.

T F 10. Everything is turning out just like the prophets in the Bible said it would.

T F 11. I frequently find myself worrying about something.

T F 12. I sometimes keep on at a thing until others lose their patience with me.

T F 13. I am usually calm and not easily upset.

T F 14. I sometimes tease animals.

T F 15. I am happy most of the time.

T F 16. I usually feel that life is worthwhile.

T F 17. I have periods of such great restlessness that I cannot sit long in a chair.

T F 18. I go to church almost every week.

T F 19. I have sometimes felt that difficulties were piling up so high that I could not overcome them.

T F 20. I believe in the second coming of Christ.

T F 21. I certainly feel useless at times.

T F 22. I do not worry about catching diseases.

T F 23. I find it hard to keep my mind on a task or job.

T F 24. Criticism or scolding hurts me terribly.

T F 25. I am not unusually self-conscious.

T F 26. I certainly feel useless at times.

T F 27. I am inclined to take things hard.

T F 28. At times I feel like picking a fist fight with someone.

T F 29. I am a high-strung person.

T F 30. Sometimes, when embarrassed, I break out in a sweat which annoys me greatly.

T F 31. Life is a strain for me much of the time.

T F 32. I enjoy many different kinds of play and recreation.

T F 33. At times I think I am no good at all.

T F 34. I like to flirt.

T F 35. I am certainly lacking in self-confidence.

T F 36. I brood a great deal.

T F 37. I sometimes feel that I am about to go to pieces.

T F 38. I sweat very easily even on cool days.

T F 39. I shrink from facing a crisis or difficulty.

T F 40. When I leave home I do not worry about whether the door is locked and the windows closed.

T F 41. I do not blame a person for taking advantage of someone who lays himself open to it.

T F 42. At times I am all full of energy.

T F 43. Once in a while I laugh at a dirty joke.

T F 44. I feel anxiety about something or someone almost all the time.

KEY FOR SCORING THE ANXIETY-DEPRESSION SCALE

Manifest Anxiety (Total: 20 items)

True

5	7	9	11	17	19	21	23
27	29	31	33	35	37	39	44

False

3	13	15	25

Depression (Total: 24 items)

True

2	24	26	36

False

1	4	6	8	10	12	14	16
18	20	22	28	30	32	34	38
40	41	42	43				

ROTTER SOCIAL REACTION INVENTORY

SOCIAL REACTION INVENTORY

This is a questionnaire to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives lettered a or b. Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you're concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief: obviously there are no right or wrong answers.

Please answer these items carefully but do not spend too much time on any one item. Be sure to find an answer for every choice. Circle the a or b next to the alternative which you choose as the statement most true.

In some instances you may discover that you believe both statements or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you're concerned. Also try to respond to each item independently when making your choice; do not be influenced by your previous choices.

<u>REMEMBER</u>

Select that alternative which you <u>personally</u> <u>believe</u> <u>to</u> <u>be</u> <u>more</u> <u>true</u>.

<u>I</u> <u>more</u> <u>strongly</u> <u>believe</u> <u>that</u>:

1. a. Children get into trouble because their parents punish them too much.

   b. The trouble with most children nowadays is that their parents are too easy with them.

2. a. Many of the unhappy things in people's lives are partly due to bad luck.

   b. People's misfortunes result from the mistakes they make.

3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.

   b. There will always be wars, no matter how hard people try to prevent them.

4. a. In the long run people get the respect they deserve in this world.

   b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

5. a. The idea that teachers are unfair to students is nonsense.

   b. Most students don't realize the extent to which their grades are influenced by accidental happenings.

6. a. Without the right breaks one cannot be an effective leader.

   b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try some people just don't like you.

   b. People who can't get others to like them, don't understand how to get along with others.

8. a. Heredity plays the major role in determining one's personality.

   b. It is one's experiences in life which determine what they're like.

9. a. I have often found that what is going to happen will happen.

   b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

<u>I more strongly believe that</u>:

10. a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.

    b. Many times exam questions tend to be unrelated to course work, that studying is really useless.

11. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.

    b. Getting a good job depends mainly on being in the right place at the right time.

12. a. The average citizen can have an influence in government decisions.

    b. This world is run by the few people in power, and there is not much the little guy can do about it.

13. a. When I make plans, I am almost certain that I can make them work.

    b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. a. There are certain people who are just no good.

    b. There is some good in everybody.

15. a. In my case getting what I want has little or nothing to do with luck.

    b. Many times we might just as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.

    b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.

17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.

    b. By taking an active part in political and social affairs the people can control world events.

<u>I more strongly believe that</u>:

18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.

    b. There really is no such thing as "luck."

19. a. One should always be willing to admit his mistakes.

    b. It is usually best to cover up one's mistakes.

20. a. It is hard to know whether or not a person really likes you.

    b. How many friends you have depends upon how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced by the good ones.

    b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. a. With enough effort we can wipe out political corruption.

    b. It is difficult for people to have much control over the things politicians do in office.

23. a. Sometimes I can't understand how teachers arrive at the grades they give.

    b. There is a direct connection between how hard I study and the grades I get.

24. a. A good leader expects people to decide for themselves what they should do.

    b. A good leader makes it clear to everybody what their jobs are.

25. a. Many times I feel that I have little influence over the things that happen to me.

    b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. a. People are lonely because they don't try to be friendly.

    b. There's not much use in trying too hard to please people, if they like you, they like you.

I more strongly believe that:

27. a. There is too much emphasis on athletics in high school.

    b. Team sports are an excellent way to build character.

28. a. What happens to me is my own doing.

    b. Sometimes I feel that I don't have enough control over the direction my life is taking.

29. a. Most of the time I can't understand why politicians behave the way they do.

    b. In the long run the people are responsible for bad government on a national as well as on a local level.

KEY FOR SCORING THE ROTTER SOCIAL REACTION INVENTORY

1. Filler
2. a
3. b
4. b
5. b
6. a
7. a
8. Filler
9. a
10. b
11. b
12. b
13. b
14. Filler
15. b
16. a
17. a
18. a
19. Filler
20. a
21. a
22. b
23. a
24. Filler
25. a
26. b
27. Filler
28. b
29. a

AVERAGE WEIGHTS FOR MEN AND WOMEN

According to Height and Age
(Metropolitan Life Insurance Company, 1959)

Height (in shoes)	Ages 20-24	Ages 25-29	Ages 30-39	Ages 40-49	Ages 50-59	Ages 60-69
			Men			
5' 2"	128	134	137	140	142	139
3"	132	138	141	144	145	142
4"	136	141	145	148	149	146
5"	139	144	149	152	153	150
6"	142	148	153	156	157	154
7"	145	151	157	161	162	159
8"	149	155	161	165	166	163
9"	153	159	165	170	170	168
10"	157	163	170	174	175	173
11"	161	167	174	178	180	178
6' 0"	166	172	179	183	185	183
1"	170	177	183	187	189	188
2"	174	182	188	192	194	193
3"	178	186	193	197	199	198
4"	181	190	199	203	205	204
			Women			
4' 10"	102	107	115	122	125	127
11"	105	110	117	124	127	129
5' 0"	108	113	120	127	130	131
1"	112	116	123	130	133	134
2"	115	119	126	133	136	137
3"	118	122	129	136	140	141
4"	121	125	132	140	144	145
5"	125	129	135	143	148	149
6"	129	133	139	147	152	153
7"	132	136	142	151	156	157
8"	136	140	146	155	160	161
9"	140	144	150	159	164	165
10"	144	148	154	164	169	*
11"	149	153	159	169	174	*
6' 0"	154	158	164	174	180	*

*Average weights not determined because of insufficient data.

WEIGHT RANGES FOR NORMAL WEIGHT AND OVERWEIGHT

MEN AND WOMEN

Men

		Normal Weight	Overweight (equal to or greater than)
5'	3"	118.8 to 145.2	151.8
	4"	122.4 to 149.6	156.4
	5"	125.1 to 152.9	159.8
	6"	127.8 to 156.2	163.3
	7"	130.5 to 159.5	166.7
	8"	134.1 to 163.9	171.3
	9"	137.7 to 168.3	175.9
	10"	141.3 to 172.7	180.5
	11"	144.9 to 177.1	185.1
6'	0"	149.4 to 182.6	190.9
	1"	153.0 to 187.0	195.5
	2"	156.6 to 191.4	200.1
	3"	160.2 to 195.8	204.7
	4"	162.9 to 199.1	208.1
	5"	166.5 to 203.5	212.7
	6"	170.1 to 207.9	217.3
	7"	173.7 to 212.3	221.9

Women

		Normal Weight	Overweight (equal to or greater than)
4'	10"	91.8 to 112.2	117.3
	11"	94.8 to 115.5	120.8
5'	0"	97.2 to 118.8	124.2
	1"	101.8 to 123.2	128.8
	2"	103.5 to 126.5	132.3
	3"	106.2 to 129.8	135.7
	4"	108.9 to 133.1	139.1
	5"	112.5 to 137.5	143.7
	6"	116.1 to 141.9	148.3
	7"	118.8 to 145.2	151.8
	8"	122.4 to 149.6	156.4
	9"	126.0 to 154.0	161.0
	10"	129.6 to 158.4	165.6
	11"	134.1 to 163.9	171.3
6'	0"	138.6 to 169.4	177.1

Summary of the Experimental Design.

	Female		Male	
	Obese	Normal	Obese	Normal
Low Cue	1	15	29	43
	2	16	30	44
	3	17	31	45
	4	18	32	46
	5	19	33	47
	6	20	34	48
	7	21	35	49
	8	22	36	50
	9	23	37	51
	10	24	38	52
	11	25	39	53
	12	26	40	54
	13	27	41	55
	14	28	42	56
High Cue	57	71	85	99
	58	72	86	100
	59	73	87	101
	60	74	88	102
	61	75	89	103
	62	76	90	104
	63	77	91	105
	64	78	92	106
	65	79	93	107
	66	80	94	108
	67	81	95	109
	68	82	96	110
	69	83	97	111
	70	84	98	112