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The manipulation of time and eating behavior: the effect of set point on the amount eaten by normal weight, moderately obese, and high obese women.

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THE MANIPULATION OF TIME AND EATING BEHAVIOR: THE EFFECT OF SET POINT ON THE AMOUNT EATEN BY NORMAL WEIGHT, MODERATELY OBESE, AND HIGH OBESE WOMEN

WILLIAM ELLIS FORD

The Manipulation of Time and Eating Behavior: The Effect of Set Point on the Amount Eaten by Normal Weight, Moderately Obese, and High Obese Women

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WEF

The Manipulation of Time and Eating Behavior: The Effect of Set Point on the Amount Eaten by Normal Weight, Moderately Obese, and High Obese Women

University of Massachusetts (1973)

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Abstract:

Schachter (1971) summarized a series of studies which indicated that normal weight people generally rely on internal physiological cues, such as the subjective feeling of hunger, to control their eating (the internal hypothesis). In contrast, obese people rely on external cues, such as the time of day, to control their food intake (the external hypothesis). Nisbett (1972) disagreed and proposed an alternative explanation. He suggested that each person has a biologically determined ideal weight or set point for weight. He argued that the critical variable with regard to the external control of eating is not whether one is obese, but rather whether one is below the biologically programmed set point for weight.

This study was designed to investigate Nisbett's hypotheses. Schachter and Gross (1968) noted that the passage of time is an important external cue for eating. They suggested that if time is manipulated, the eating behavior of obese persons should also be manipulated. In contrast, based on Nisbett's (1972) suggestion, this study predicted that if time is manipulated, the eating behavior of all subjects below set point (as defined by their eating and weight history), regardless of their absolute weight, should also be manipulated.

The present study used six groups of fourteen female subjects each. The groups differed with regard to the subject's present weight and her diet/weight history. Subjects who were on a diet and who also lost weight were assumed to be below set point. The groups were labeled as follows: (1) High Obese at Set Point, (2) High Obese Below Set Point-Diet, (3) Moderately Obese at Set Point, (4) Moderately Obese Below Set Point-Diet, (5) Normal Weight at Set Point, (6) Normal Weight Below Set Point-Diet.

For half the subjects, the clock in the experimental room was speeded up to twice its normal rate during the first half hour of the subjects' hour-long participation (the fast clock group); for the other half, the clock was slowed down to half its normal rate (the slow clock group). After half an hour, participants were given low calorie desserts to taste. According to the clock, the fast clock group was eating at their normal time, the slow clock group at 45 minutes before their normal time.

The results did not support Nisbett's hypothesis. Being below set point had no effect on amount eaten. However, it was found that Normal Weight subjects ate significantly more when the clock said it was their dinner time than when it indicated it was before dinner time. The High Obese subjects ate the same amount regardless of the time on the clocks.

The results reflect the high probability that Moderately Obese women will eat between meals, even though they can control their food intake at mealtimes. The eating behavior of the High Obese females was not influenced to any great extent by the time, in contrast to

the Normal Weight females, who showed significant differential sensitivity to the time. This may reflect the likelihood that High Obese females respond to a wide range of stimuli with eating. The eating behavior of Normal Weight females is externally controlled, demonstrating that normal food intake can also be controlled by external cues. These results suggest that there are two distinct groups of obese females; the moderately obese and the high obese, who respond quite differently with regard to external cues.

Differences between the results of the present study and those of Schachter and Gross (1968) were discussed. It was suggested that these differences were possibly a function of subject gender, the foods used for tasting, or the kind of statistical analysis used. Implications for treatment and future research were discussed.

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The Manipulation of Time and Eating Behavior: The Effect of Set Point on the Amount Eaten by Normal Weight, Moderately Obese and High Obese Women

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(1.1) Introduction

It has been estimated that there are between 40 to 80 million obese people in the United States (USPHS, 1966). Wyden (1965) noted that in response to a public opinion survey, some 9.5 million women reported being on diets, another 16.5 million reported "watching their weight" and 26.1 million expressed concern over their waistline. This totals to some 52 million weight conscious citizens. Obviously the problem of obesity is widespread and of great concern to almost one quarter of the population.

When talking about obesity, it is important to remember that obesity is probably not a monolithic or unitary condition. As the United States Public Health Services (1966, p.33) suggests:

> Obesity, the result of a positive caloric balance, can be the outcome of a number of disturbances. The variations in causes and subsequent manifestations indicate that not all obesity can be considered the same.

Because of the diversity of approaches to the problem, many ways of treating obesity have been developed over the years, based on various theories of its etiology. For example, genetic (e.g., Newman, Freeman, and Holzinger, 1937; Mayer, 1968), social (e.g., Goldblatt, Moore, and Stunkard, 1965), and biological-physiological (e.g.,

Teitelbaum, 1955) theories have been advanced to explain how the obese become overweight.

(1.2) Psychological Approaches to Obesity

Psychologists have developed approaches to treating overweight based on psychological and/or behavioral models of obesity. As with other abnormal kinds of behavior, two main approaches to overweight have arisen within the field of psychology. The first analyzes obesity in terms of hypothetical personality factors which are used to explain why people overeat. The other approach stresses how people become obese based on situational or environmental controls of behavior.

(1.3) Why People Overeat

This first approach to overeating is exemplified in the work of Hilde Bruch (1957). Bruch believes that obesity is a symptom of an underlying personality disorder which has its origins in early life experiences. Bruch (1961) says that some parents unknowingly induce obesity in their children by using food in response to the child's emotional stresses while concomitantly failing to respond to hunger with food. Thus eating becomes a way of "treating" emotional upset in the growing child, and she theorizes that this eventually leads to obesity. However, this approach has been questioned by Schachter, Goldman, and Gordon (1968). In an experimental investigation of this issue, they reported that stress and fear do not lead to increased food consumption in the obese, as would be predicted from Bruch's

speculations.

Psychoanalytically oriented writers (e.g., Deri, 1955) hypothesize that obesity is due to disturbance in the anal period of psychosexual development. This is the period of a child's life when the parents are hypothesized to be concerned with bladder and bowel training. If a child "fixates" or stays at this level he will become concerned with orderliness, independence, and he may develop fears of heterosexuality. Within this framework, overeating and obesity are seen as a compulsive habit representing the individual's defiance of those who attempt to control his eating behavior. Obesity, in this context, is also seen as protecting the individual from heterosexual relationships because of the unattractiveness overweight engenders.

Some analytically oriented writers also view obesity as arising out of a fixation at the "anal stage" of development. Many efforts have been made to experimentally validate these various psychodynamic formulations but they have not been overly successful. Many predictions about behavior derived from these theories have not been supported in the experimental literature. For example, if one assumes a psychodynamic approach to obesity, treatment aimed simply at weight reduction and not at the "underlying cause" can be expected to lead to another symptom being substituted in place of the excessive eating. In an attempt to experimentally test this hypothesis Cauffman and Pauley (1961) placed 26 obese persons on a 1,000 calorie per day diet, supplemented with the drugs prochlorperazine and amphetamine. These patients lost an average of 20% of body weight. Instead of an increase in depression, sensitivity or suspiciousness as would be

predicted, the authors reported fewer such symptoms in those who lost more than one pound per week. Shipman and Plesset (1963) and Kollar and Atkinson (1966) reported similar results. Biggers (1966) found a decrease both in anxiety and depression. Results contradictory to these have also been reported by several investigators. For example, Swanson and Dinello (1970) reported that while on diets, their subjects showed increased anxiety and depression. Thus the research literature in this area is quite inconsistent but there appears to be no solid research support for the psychodynamic formulations. Finally, the psychological problems hypothesized to cause obesity (e.g., depression, anxiety, etc.) by psychoanalytically oriented researchers, may, in fact, be reactions to the very fact of being overweight.

In general, psychodynamically oriented approaches have netted few reliable relationships between personality and/or characterological problems and obesity. For this reason, the trend in studying obesity has been moving towards investigating the environmental controls of eating behavior.

(1.4) How People Come to Overeat

The second psychological approach to obesity stresses how people come to overeat based on situational controls of behavior. This section will present some of the studies which have indicated that overeating may be under environmental control.

This approach was given significant impetus by Stunkard and Koch (1964). In their study, obese and normal Ss swallowed pressure sensitive balloons in order to measure stomach motility. They found

that the normal Ss reported feelings of hunger correlated with stomach contractions, while the obese Ss showed no such relationship. These authors concluded that, in normals, stomach contractions are one peripheral event highly correlated with the feeling of hunger and the desire to eat; with obese subjects there is little correspondence between their actual physiological state and their desire for food.

Schachter and his students have done a series of studies which have attempted to further explore this and related phenomenon. Schachter, Goldman and Gordon (1968), in an induced fear study, noted that normals eat more when calm than when frightened. They also pointed out that normals eat less when sated than when deprived. These authors, however, found that neither fear nor satiation influenced the amount of food eaten by obese subjects. The authors concluded that obese subjects, in contrast to normal weight subjects, do not label as hunger those bodily sensations which are usually associated with food deprivation.

Following up on the idea that the actual state of the stomach has nothing to do with eating in the obese, Schachter and Gross (1968) manipulated the apparent time of day so that some subjects thought the experimental session was being held after dinner and some thought it was being conducted before dinner. Obese subjects ate more when they thought it was after rather than before dinner. With normal subjects, the effect was just the opposite. That is, they ate more when they thought it was before dinner than after dinner. Schachter and Gross explained this reversal by arguing that the normal subjects did not want to spoil their supper when they thought it

was after dinner and consequently they ate less. The authors, however, went on to reanalyze their data because of confounding between the time manipulation and the subjects' actual time of eating. That is, all subjects were run at 5:00, regardless of the usual time of eating. Thus, if a subject usually ate at 5:30 and was in the Fast Clock condition, his apparent time of eating would be a greater time distance away from his usual eating hour than a subject who usually ate at 5:45. After adjusting for these effects, the authors concluded that the apparent time had no effect on the amount eaten by normals yet controlled quite strongly the eating behavior of the obese.

Nisbett (1968b) attempted to control the amount eaten by obese subjects by varying the number of external cues which influence eating. In his study, obese and normal subjects were offered three sandwiches. In this situation, the obese ate more than the normals, even though the length of food deprivation was constant for both. When only one sandwich was immediately at hand, and other were available but out of sight, the obese ate less than the normals.

Cabanac and Duclaux (1970) also obtained results consistent with Schachter's hypothesis. In their study, injection of glucose into obese subjects did not cause the taste of the sucrose solution to change from pleasant to unpleasant as is true with normals. The authors concluded that (p. 496), "This is consistent with the theory of a decreased sensitivity to internal signals in the control of food intake of obese people." Schachter (1971) (a) cited a study by Decke which further investigated the effect of taste on eating. According

to Schachter, Decke's results indicated that, given equal lengths of food deprivation, obese subjects eat more than normals when food is good tasting, but eat less than normals when food is unpleasant tasting. Nisbett (1968a) found essentially the same phenomenon. Similarly, Hashim and Van Itallie (1965) have shown that caloric intake can be reduced in obese subjects by giving them a bland, unpleasant tasting diet.

Johnson (1970) investigated these relationships in an instrumental learning situation. Specifically, Johnson attempted to determine if prior-taste and food visibility conditions would influence the instrumental behavior of obese persons differently than normals. He found that the more prominent the food cues were, the higher was the response rate of the obese. No such relationship was found for normals. He also found no effect due to the prior taste conditions. Johnson summarized his results by saying that stimulus prominence had a marked effect on the obese subjects.

Johnson (1970, p. 6) has condensed the results of the above series of studies into the following hypotheses:

> 1. The internal hypothesis--in which responsiveness to internal cues is an inverse function of weight. The internal hypothesis describes how the eating behavior of normals is controlled.
>
> 2. The external hypothesis--in which responsiveness to external cues is a direct function of weight. The external hypothesis describes how the eating behavior of obese subjects is controlled.

Certainly this series of studies are impressive for their consistency of results and rather unambiguous data. Several caveats are in order, however. First, the vast majority of subjects used by

these investigators were male undergraduate students. According to Rudman (1973) sex is a very important factor in determining the effect of cue saliency on eating behavior. In fact, Rudman's obese female subjects behaved exactly the opposite to what would be predicted on the basis of the external hypothesis. That is, Rudman's obese female subjects ate less with increasing cue prominence. This reversal may be explained, in part, as a function of Rudman's procedure. He weighed his subjects prior to letting them eat. One wonders how much an obese woman would eat after having been just reminded in very real numbers of her gross overweight, particularly when food is very obviously available. Another problem with the Schachter-Nisbett series of studies is that both used undergraduate students at Yale and Columbia. While this is certainly a biased sample of undergraduate, the use of a sample made up entirely of undergraduates may be a dubious procedure. It is doubtful that undergraduates eat like the general population, either in terms of diet or in terms of when they eat. Thus, obesity in this population may arise out of variables other than those which lead to obesity in older, middle class people.

(1.5) <u>A Closer Look at the Data of Johnson and Nisbett</u>

In Johnson's (1970, p. 30) discussion of his findings, he noted a rather interesting peculiarity in his data. In spite of his randomized assignment of subjects to the various treatment groups, one group had a mean percent overweight which was considerably higher than the means for the other obese groups. Johnson says, "Moreover, this higher percent is primarily a result of three individuals who

exceeded 50% overweight. This is contrasted with the fact that no other obese group has even one S exceeding 50% of the desirable weight. More important, though, is that the mean number of responses for these three subjects is . . . well below the . . . average for the obese . . . group as a whole." On the basis of this Johnson suggested that there were 2 groups of overweight subjects. One of these groups, the moderately overweight group, demonstrated the experimental effect. The other group, the distinctly obese group, did not perform as predicted. He concluded that possibly the external hypothesis in general is restricted to the moderately overweight and not the grossly obese. Johnson noted that the mean percent overweight in the Schachter-Nisbett studies (Nisbett, 1968a; 1968b) ranged from 15 to 75%. This parallels the large variability on the dependent variable in these studies. Nisbett (1968b) himself remarked that this leads to a rather weak interpretation of the external hypothesis.

Cabanac, et. al. (1971) studied the response to glucose loads before, during, and after weight loss. Prior to weight loss, and after the weight was regained, glucose loading made sweet solutions unpleasant tasting. During weight loss, glucose loads had no effect on the pleasantness of sweet solutions. These authors suggested the presence of a "ponderostat" which detects whether an organism is at its "set point" or biologically programmed ideal weight. When an organism is below its set point, this hypothetical ponderostat ignores satiety signals. Thus, when the organism is below set point, a glucose load does not have the same effect of making other sweet substances unpleasant as it would when the organism is at its set point.

Following this line of reasoning Nisbett (1972) suggests that the most extremely obese subjects should show normal eating patterns and those that are below set point (even though still obese) would show the "obese" pattern as described in the Schachter-Nisbett studies. In his 1968a study, Nisbett included normal weight subjects who had been obese but who had lost weight. These subjects would be expected to be below set point and should have shown obese eating patterns. Normal weight subjects were classified as below set point if they had ever been overweight. Underweights were classified as below set point if more than 10% below the average weight for their height. Overweight subjects were classified as being at their set point if they were 40% or more overweight. Within each weight group, Nisbett noted that subjects who are probably below their set points are more responsive to external cues, such as taste, than those subjects who are at or above their set point.

Nisbett (1972) concludes:

> Thus, when an obese individual's degree of overweight is so great as to indicate that he has ignored social pressure and allowed his weight to equal or exceed its set point, he appears to behave like individuals of normal weight. However, where there is evidence that the individual is below his set point, he appears to behave like an obese individual, even if he is of normal weight or is underweight.

From the work of Johnson (1970) and Nisbett (1972) it appears that there might be differences among the obese which restrict the application of the external hypothesis to only certain subgroups of them, and which may make the external hypothesis applicable to certain normal weight subjects also. Nisbett suggests that this critical difference involves whether the subjects are or are not at their

set point. The present study investigates the possibility that the critical variable determining the applicability of the external hypothesis is whether the subjects were or were not at set point.

(1.6) The Present Study

The methodology of the present study is somewhat similar to that of Schachter and Gross (1968). These authors noted that the passage of time is an important external cue for eating; that is, most people know that they are supposed to eat 4 or 5 hours after the last meal. According to Schachter and Gross (1969), "In an absence of other food relevant cues or of competing alternatives to eating, the eating behavior of the externally controlled person should be time bound. This suggests that if we manipulate time we should be able to manipulate the eating behavior of obese subjects."

Based on Nisbett's (1972) suggestion, the present study alters the prediction of Schachter and Gross (1968). That is, the present study predicts that if we manipulate time we should be able to manipulate the eating behavior of all subjects who are below their set point as defined by their dieting and weight history, regardless of their absolute weight or degree of obesity.

In order to do this, the present study uses 6 groups of experimental subjects. The groups differ with regard to the subjects' present weight and her diet-weight history. Subjects who are currently on a diet are assumed to be below set point. The groups will be labled as follows:

1. High Obese at Set Point group
2. High Obese Below Set Point-Diet group
3. Moderately Obese at Set Point group
4. Moderately Obese Below Set Point-Diet group
5. Normal Weight at Set Point group
6. Normal Weight Below Set Point-Diet group

In an attempt to assess if the subject's dieting is somehow interacting with her being below set point, another group is included. This group consists of normal weight subjects who have lost weight but who are no longer on a diet--the Normal Weight Below Set Point-No Diet group.

(1.7) Hypotheses:

The following predictions are made about the amount eaten by each group:

1. The first prediction concerns the overall effect on the amount eaten of the Set Point classification variable, as derived from Nisbett's (1972) discussion. It is predicted that subjects Below Set Point will eat significantly more than subjects At Set Point. Nisbett (1972) suggested that subjects Below Set Point are in a state of chronic deprivation and thus should eat significantly more than subjects At Set Point, even though both may have similar short-term or situationally determined deprivation conditions. An example of such a situationally determined deprivation condition would be the period of time since the last meal. The subjects Below Set Point can be conceived of as having an additional long-term deprivation superimposed on any short-term situational deprivation.

2. The second prediction involves the overall effect on amount eaten of the two levels of the time manipulation variable. Subjects

who think the experimental session is after dinner will eat significantly more than subjects who think it is before dinner. That is, the manipulation of time will affect the amount eaten by all subjects. This is consistent with the assumption that external cues are the major determiners of eating behavior for those Below Set Point, while both internal and external cues determine the eating behavior of those At Set Point.

3. The third prediction specifies how the Set Point variable and the Time Manipulation variable will influence each other when combined. It is predicted that external cues (i.e., the time manipulation) will have less of an affect on those At Set Point. As a result, the critical prediction is that of a significant interaction between dieting/weight history and time. Subjects Below Set Point will eat significantly more than subjects At Set Point when they think it is after dinner time. Subjects Below Set Point will eat significantly less than subjects At Set Point when they think it is before dinner time. This is predicted regardless of the subjects' absolute weight or degree of overweight. That is, the eating behavior of subjects Below Set Point will be influenced by the external time cue (i.e., the subject's perception that the experimental session is occurring after her regular dinner time) significantly more than the behavior of subjects At Set Point. Thus, the external hypothesis will apply to subjects Below Set Point, regardless of whether they are of normal weight or obese weight.

4. The final prediction deals with the effect on amount eaten of the Set Point classification variable and the Time Manipulation in

the Normal Weight subjects. Both groups of normal weight subjects who are Below Set Point will eat significantly more than the subjects At Set Point. Subjects who think the experimental session is after dinner will eat significantly more than the subjects who think it is before dinner. The subjects Below Set Point (Diet and No Diet) will eat significantly more than subjects At Set Point when they think it is after dinner time. Subjects Below Set Point (Diet and No Diet) will eat significantly less than subjects At Set Point when they think it is before dinner time.

(2.0) Method

(2.1) Subjects

6 groups of 14 subjects each were used in this study:

Hi Obese at Set Point--consisted of females who were at least 45% over the average weight for females of the same height (based on the 1959 norms of the Metropolitan Life Insurance Company) who claimed not to have dieted in the past six months and who claimed to have maintained their weight over that period.

Hi Obese Below Set Point-Diet--consisted of females who met the above weight criteria but who claimed to be currently on a diet and who claimed to weigh less than their average weight of the past 2 years.

Mod Obese at Set Point--consisted of females who were between 15% and 44% over the average weight for females of the same height who claimed not to have dieted in the past six months and who claimed to have maintained their weight over that period.

Mod Obese Below Set Point-Diet--consisted of females who met the above criteria but who claimed to be currently on a diet and who claimed to weigh less than their average weight of the past 2 years.

Normal Weight at Set Point--consisted of females who were within 14% of the average weight for females of the same height who claimed not to have dieted in the past six months and who claimed to have maintained their weight over that period.

Normal Weight Below Set Point--consisted of females who were within 14% of the average weight for females of the same height who claimed to weigh less than their average weight of the past 2 years.

An additional group of 14 subjects was also included:

Normal Below Set Point No Diet--consisted of females who were within 14% of the average weight for females of the same height who claimed not to be currently on a diet but who claimed to weigh less than their average weight of the past 2 years.

(2.1-1) Actual Subjects Used

The actual mean percentage weight deviation from normal, the range of the weight deviations, the mean weight, and the mean height of the actual groups used in this study appear in Table 1. As can be seen, the actual groups match the criteria as established for the various groups.

Because the treatment groups as defined in this study required that the subjects meet rather specific criteria, it was not possible to obtain subjects randomly. Further, an effort was made to obtain as broad a sampling of subjects as possible. Because of these two factors, several different methods were used to obtain subjects. A total of 132 subjects participated in this study. Of this total, 19 subjects were obtained in response to classified advertisements placed in local newspapers. These ads read:

> Women: Earn $2.00/hr. taste testing a new low calorie dessert. Call - - - - -

Twenty-nine Ss were obtained from Diet Workshop classes in Greenfield and Northampton, Massachusetts.[1] Seven Ss were obtained from the Diet Marathon at the University of Massachusetts. This was a dieting campaign designed to raise money for a local charity. Fifty-seven Ss were obtained from the Licensed Practical Nurse Program[2] at Northeastern Nebraska Technical College, Norfolk, Nebraska, where the

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[1]This was made possible through the cooperation of Ms. Thelma Whitten, Area Director, Diet Workshop, Springfield, Massachusetts.

[2]This was facilitated with the help of Ms. Anita Brenneman, R.N., Head of Licensed Practical Nurse Program, Northeastern Nebraska Technical College, Norfolk, Nebraska.

Table 1

Characteristics of the Subjects

GROUP	HEIGHT IN INCHES	MEAN WEIGHT IN LBS.	MEAN % WT. DEVIATION	RANGE
HI OBESE AT SET PT. FAST CLOCK	64.71	206.7	67%	45% to 88%
HI OBESE AT SET PT. SLOW CLOCK	65.14	212.0	75%	47% to 108%
HI OBESE DIET FAST CLOCK	64.43	239.29	97%	54% to 155%
HI OBESE DIET SLOW CLOCK	61.43	182.71	64%	47% to 86%
MOD OBESE AT SET PT. FAST CLOCK	64.43	151.29	24%	15% to 37%
MOD OBESE AT SET PT. SLOW CLOCK	63.57	152.43	28%	17% to 38%
MOD OBESE DIET FAST CLOCK	64.29	152.00	26%	15% to 38%
MOD OBESE DIET SLOW CLOCK	65.57	155.29	24%	15% to 39%
NORMAL AT SET PT. FAST CLOCK	65.43	127.71	2%	-8% to 11%
NORMAL AT SET PT. SLOW CLOCK	64.86	122.00	-2%	-11% to 5%

NORMAL DIET FAST CLOCK	65.29	136.57	9%	0% to 14%
NORMAL DIET SLOW CLOCK	65.14	130.43	5%	0% to 13%
NORMAL BELOW SET PT. CONTROL FAST CLOCK	64.14	125.86	5%	-15% to 14%
NORMAL BELOW SET PT. CONTROL SLOW CLOCK	64.43	125.71	3%	-1% to 6%

E was an instructor. Finally 20 Ss were obtained through personal requests by the E.

Of the 132 total, 34 Ss were discarded for several reasons:

2 Ss because they were pregnant
4 Ss because of clock malfunctions
2 Ss because they did not complete the necessary forms
4 Ss were used for pilot data
1 S indicated she did not taste the desserts fully because she did not want to spoil her supper
12 Ss guessed the time manipulation
2 Ss each were discarded randomly from the Moderately Obese at Set Point Group, the Moderately Obese Below Set Point-Diet group, the Normal at Set Point Group, and the Normal Below Set Point-Diet group in order to have an equal number of subjects per cell.
1 S for not indicating that she had a watch in her purse

Four of the above 34 subjects were on public welfare and thus would have been discarded also.

Table 2 shows how the subjects were placed in the several weight groups, according to where they were obtained. The mean ages for each source group also appear in Table 2. According to their source groups the Ss appear to be well-spread among the various treatment groups.

The mean ages and their variances for each treatment group appear in Table 3. In order to determine if the variances were homogeneous, Hartley's test was performed. The obtained value was 11.97 (a=12, 6 df), indicating that the variances were homogeneous. An analysis of variance (ANOVA) was then performed to determine if there were any significant differences among the groups according to age. This analysis is summarized in Table 3. As can be seen, there was a significant weight effect. In order to find which means were significantly different, the Newman-Kuels procedure for post-hoc compari-

Table 2

Placement of the Subjects in the Several Weight Groups
According to Where They Were Obtained

Number of Subjects
(Mean Ages)

GROUP	CLASSIFIED ADS	DIET WORKSHOP	DIET MARATHON	LPN's	PERSONAL
HI AT SET PT.	1 (20)	4 (36.75)		5 (28.0)	4 (39.25)
HI DIET		10 (35.10)	1 (17)		3 (43.33)
MOD AT SET PT.	1 (26.0)			10 (23.0)	3 (42.66)
MOD DIET	2 (19.5)	4 (46.66)	3 (20.0)	2 (25.5)	3 (24.33)
NORM AT SET PT.	3 (28.0)			10 (22.0)	1 (34.0)
NORM DIET	1 (24.0)	5 (37.2)		4 (18.25)	4 (24.75)
TOTALS	8	23	4	31	18

GRAND AGE MEAN = 28.86 years

Table 3

Mean Ages and Their Variances (Variances appear in parenthesis)

High Obese

	Fast Clock	Slow Clock	
At Set Point	35.71(251.91)	30.57(189.95)	
Below Set Point	40.57(228.95)	30.57 (46.95)	$\bar{X}$ High Obese = 34.36

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	28.71(279.57)	26.14 (31.81)	
Below Set Point	26.86 (91.81)	24.71 (57.24)	$\bar{X}$ Moderate Obese = 26.61

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	22.29 (30.57)	26.00)110.67)	
Below Set Point	28.43(136.29)	25.71)239.57)	$\bar{X}$ Normal = 25.61

$\bar{X}$ At set point = 28.24 $\bar{X}$ Fast Clock = 30.43

$\bar{X}$ Below set point = 29.48 $\bar{X}$ Slow Clock = 27.29

Hartley's test = 11.97 (a=12, 6 df)

Analysis of Variance for Subjects' Ages

Source	df	MS	F
Weight Group	2	642.25	4.55 (p<.025)
Set Group Class	1	32.19	<1
Clock Speed	1	207.43	1.47
Weight Group X Set Point Class	2	44.01	<1
Weight Group X Clock Speed	2	117.25	<1
Set Point Class X Clock Speed	1	68.76	<1
Weight Group X Set Point Class, X Clock Speed	2	22.58	<1
Error	72	141.27	

sons was used. The results appear in Table 4. These results indicate that the High Obese Ss were significantly older ($p<.05$) than both the Moderately Obese and the Normal Weight Ss. This finding is consistent with epidemiological studies of obesity which have found a positive correlation between weight and age for women below sixty years of age (USPHS, 1965).

The amount of weight lost by the Ss in the Below Set Point-Diet groups was divided by each Ss' original weight to determine if the Below Set Point-Diet groups lost equal percentages of their pre-diet weight. These mean percentages appear in Table 5. An ANOVA was performed on the data and is also summarized in Table 5. No significant differences were found. All Below Set Point-Diet groups lost about 10 percent of their original weight.

The mean incomes and their variances for each treatment group appear in Table 6. The incomes cited are those reported by the S, divided by the number of reported dependents in the family. If students received their income from their parents, the parents' income was used, again divided by the appropriate number of dependents. Hartley's test was performed on the variances. The value for this test was 11.39 (a=12, 6 df) indicating that the variances were homogeneous. An ANOVA was performed to determine if there were any significant income differences among the groups. The analysis is summarized in Table 6. As can be seen, there were no significant differences among the groups according to income. The grand mean for income was $3690.63 per dependent. The mean number of dependents

Table 4

Contrasts Among the Means of the Significant Degree of Overweight Effect

$\overline{X}$ High Obese = 25.60714 $\overline{X}$ Mod. Obese = 26.60714

$\overline{X}$ Normal = 34.35714

Differences between means:

	$\overline{X}$ Moderate Obese	$\overline{X}$ Normal
$\overline{X}$ High Obese	1.00	8.75 ($p<.05$)
$\overline{X}$ Moderate Obese		7.75 ($p<.05$)

Newman-Kuels criterion values:

Means 3 ordered steps apart = 7.6364
Means 2 ordered steps apart = 6.35618

Table 5

Mean Percentage of Weight Lost for the Below Set Point-Diet Groups and their Variances (Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Pt.	.11(.006)	.08(.005)	$\overline{X}$ = .09
Norm Below Set Pt. Diet	.10286(.005)	.09(.004)	$\overline{X}$ = .10
Norm Below Set Pt. No Diet	.11(.004)	.09(.004)	$\overline{X}$ = .10
	$\overline{X}$ = .11	$\overline{X}$ = .09	

Hartley's test = 1.57 (a=6, 6 df)

Analysis of Variance for Percentage of Weight Lost

Source	df	MS	F
Set Point Classification	2	.0001	<1
Clock Speed	1	.0038	<1
Set Point Classification X Clock Speed	2	.0004	<1
Error	36	.0044	

Table 6

Subjects' Mean Incomes and their Variances
(Variances appear in parentheses)

High Obese	Fast Clock	Slow Clock
At Set Point	3337.71 (6314856.57)	3143.57(7752372.62)
Below Set Point	3615.57(14796630.61)	3011.86(2657310.14)

Moderate Obese	Fast Clock	Slow Clock
At Set Point	4257.00 (4011683.67)	2793.86(6441415.81)
Below Set Point	4877.14(13523657.14)	3366.43(6080822.29)

Normal Weight	Fast Clock	Slow Clock
At Set Point	3647.43 (4754864.62)	3125.71(2058297.90)
Below Set Point	5204.57(23443064.61)	3906.71(5687161.57)

Hartley's test = 11.39 (a=12, 6 df)

Analysis of Variance for Subjects' Incomes

Source	df	MS	F
Weight Group	2	3742094.05	<1
Set Point Class.	1	7886858.58	<1
Clock Speed	1	18236444.30	2.24
Weight Group X Set Point Class.	2	2103553.19	<1
Weight Group X Clock Speed	2	2074115.05	<1
Set Point Class. X Clock Speed	1	887246.30	<1
Weight Group X Set Point Class. X Clock Speed	2	232235.19	<1
Error	72	8126844.80	

reported was 3.18. Thus the average income multiplied by the mean number of dependents was $11,736.20.

In summary, the Ss in the main part of this study had a mean income of $11,736.20 ($3690.63/dependent) whose mean age was 28.9 years. The High Obese Ss were significantly older than their Moderately Obese and Normal Weight counterparts. This finding agrees with epidemiological studies of the relationship between weight and age.

(2.1-2) Control Ss

The Normal Weight Below Set Point-No Diet group will be compared only with the other Normal Weight Ss in order to assess the affect of being Below Set Point, both in Diet and No-Diet conditions. These groups will be referred to as "Control Groups" for simplicity. Table 7 shows how the Ss were placed in the several weight groups, according to where they were obtained. The mean ages for each source group also appear in Table 7. The mean ages and their variances for each treatment group appear in Table 8. In order to determine if these variances were homogeneous, Hartley's test was again performed. The obtained value was 11.98 (a=6, 6 df) indicating that the variances were homogeneous. An ANOVA was done to determine if there were any significant differences among the groups according to age. This analysis is summarized in Table 8. From these results, it is apparent that there were no significant differences among the groups according to age.

Table 7

Placement of the Subjects in the Normal Weight Groups According to Where They Were Obtained.

Number of subjects
(Mean Ages)

GROUP	CLASSIFIED ADS	DIET WORKSHOP	DIET MARATHON	LPN's	PERSONAL
NORM AT SET PT.	3 (28.0)			10 (22.0)	1 (34.0)
NORM DIET	1 (24.0)	5 (37.2)		4 (18.25)	4 (24.75)
NORM BELOW SET PT. NO DIET	5 (17.8)			6 (18.83)	3 (29.33)
TOTALS	9	5		20	8

GRAND MEAN FOR AGE = 23.98 years

Table 8

Mean Ages and Their Variances for Control Groups
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	22.29 (30.57)	26.00(110.67)	$\bar{X}$ = 24.15
Norm Below Set Pt. Diet	28.43(136.29)	25.71(239.57)	$\bar{X}$ = 27.07
Norm Below Set Pt. No Diet	18.00 (20.00)	23.43 (84.62)	$\bar{X}$ = 20.72
	$\bar{X}$ = 22.91	$\bar{X}$ = 25.05	

Hartley's test = 11.98 (a=6, 6 df)

Analysis of Variance for Subjects' Ages (Control Groups)

Source	df	MS	F
Set Point Classification	2	141.74	1.41
Clock Speed	1	48.21	<1
Set Point Classification X Clock Speed	2	64.50	<1
Error	36	100.45	

The amount of weight lost by the Ss in the Below Set Point-Diet and No Diet groups was divided by each Ss' original weight to determine if the Below Set Point groups lost equal percentages of their pre-diet weight. These mean percentages appear in Table 9. An ANOVA was performed on the data and is also summarized in Table 9. No significant differences were found.

The mean incomes and their variances of each group appear in Table 10. The incomes are those reported by the S divided by the reported number of dependents. For students without a regular income, the income used was that of the parents divided by the appropriate number of dependents.

The value for Hartley's test was 11.98 (a=6, 6 df), again indicating that the variances were homogeneous. An ANOVA was performed to determine if there were any significant income differences among the groups. This analysis is summarized in Table 10. There were no significant effects found. The grand mean for income was $3858.43 per dependent. The mean number of dependents reported was 2.86. Thus the average income multiplied by the mean number of dependents was $11035.11.

In summary the Ss used in the Control part of this study had a mean income of $11035.11 ($3858.43 per dependent). Their mean age was 23.98 years.

(2.1-3) Summary of S Characteristics

The Ss used in both the Main part of this study and in the Control part were older than those Ss used by Schachter and Gross

Table 9

Mean Percentages of Weight Lost (Control groups) and Their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm Below Set Pt. Diet	.11000(.004070)	.09000(.003973)	$\overline{X}_{A1}$ = .10000
Norm Below Set Pt. No Diet	.13286(.005337)	.11857(.004847)	$\overline{X}_{A2}$ = .12571
	$\overline{X}_{Fast\ Clock}$ = .12143	$\overline{X}_{Slow\ Clock}$ = .10426	

Hartley's test = 1.34 (a=4, 6 df)

Analysis of Variance for Percentage of Weight Lost (Control Groups)

Source	df	MS	F
Set Point Classification	1	.0046	<1
Clock Speed	1	.0021	<1
Set Point Classification X Clock Speed	1	.0001	<1
Error	24	.0061	

Table 10

Mean Incomes and Their Variances for Control Groups
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm at Set Pt.	3647.43(4754864.62)	3125.71(2058297.90)	$\overline{X}_{A_1}=3386.57$
Norm Below Set Pt. Diet	3935.14(20519147.47)	5176.14(8695284.14)	$\overline{X}_{A_2}=4555.64$
Norm Below Set Pt. No Diet	3594.86(4739613.81)	3671.29(271435.57)	$\overline{X}_{A_3}=3633.08$
	$\overline{X}_{B_1} = 3725.81$	$\overline{X}_{B_2} = 3991.05$	

Hartley's test = 11.98 (a=6, 6 df)

Analysis of Variance for Incomes (Control Groups)

Source	df	MS	F
Set Point Classification	2	5318215.14	<1
Clock Speed	1	739484.02	<1
Set Point Classification X Clock Speed	2	2811164.95	<1
Error	36	7246978.21	

(1968) in their time manipulation study. Their Ss had a mean age of 18.89 years. In the Main part of this study the Ss were considerably older, having a mean age of 28.86 years. This is consistent with the goal of using a more representative subject population than a sample of college freshmen or sophomores might provide. In the Control part of the study the mean age of the Ss was 23.98 years. While this is some five years younger than the mean age in the Main part of the study, it is still older than the usual college freshman or sophomore.

The lack of significant differences among the groups according to income is consistent with the desire to obtain as homogeneous a subject sampling as possible for this study. Moore, Stunkard, and Srole (1962) and Goldblatt, Moore, and Stunkard (1965) found a significant relationship between obesity and socioeconomic status. In fact, Goldblatt, et. al. (1965) found that obesity was six times more common among women of low status as compared to women of high status. While the effect of SEC was not investigated per se in this study, it was deemed desirable to have as homogeneous a group with regard to income as possible so as to decrease variability which might arise out of the factors investigated by Moore, et. al. (1968) and Goldblatt, et. al. (1965).

Some cautions are in order, however, about the present data. First a complex measure of SEC, such as used by Moore, et. al., was not possible. Within the "taste test" guise of this study, many Ss objected to giving income information because they felt it was extraneous to what they had volunteered for. Further, for many Ss whose occupation was farming, it was extremely difficult to estimate an ac-

curate income. Similarly, unemployed women and students were notoriously poor at even estimating the income of their family groups. Finally, the obtained homogeneity of income may have been more apparent than real. It can be seen from reviewing Tables 6 and 10 that the income variances were quite large. This indicates that while the mean incomes did not differ in the analyses of variance, the means were based on large intra-group variability. This fact needs to be taken into consideration when interpreting the income data. Aside from these cautions, the S sample statistically met the established criteria for age and income as needed for this study.

(2.1-4) <u>Physician Return Rate</u>

Table 11 summarizes the return rate of the subjects' weight records from their personal physicians. The overall return rate was 86%. The return rate of useful information was 62%.

(2.2) <u>Apparatus</u>:

Two Heathkit GC100S Electric Clocks were used. These are digital clocks which were specially modified so that the time could be changed manually be remote control. The seconds display diodes were also removed from each clock. In the experimental rooms, one clock was easily visible to each <u>S</u>. Strawberry, lemon, orange, cherry, and lime D-Zerta diet gelatin was served as the "new low calorie dessert." These 5 flavors were taste-rated in a pilot study and found to be of relatively equal taste appeal. Each flavor was measured into 100 gram amounts and served in Topco plastic Manhattan

Table 11

Return Rate of Physician's Records

GROUP	# RETURNED	%	# RETURNED WITH USEFUL INFO	%
Hi At Fast	6	86%	3	43%
Hi At Slow	7	100%	7	100%
Hi Diet Fast	6	86%	6	86%
Hi Diet Slow	6	86%	6	86%
Mod At Fast	7	100%	5	71%
Mod At Slow	6	86%	4	66%
Mod Diet Fast	4	57%	2	28%
Mod Diet Slow	6	86%	5	71%
Norm At Fast	6	86%	3	42%
Norm At Slow	7	100%	5	71%
Norm Diet Fast	4	57%	2	28%
Norm Diet Slow	7	100%	5	71%
Control Slow	6	86%	5	71%
Control Fast	6	86%	3	42%
Total	88	$\overline{X}\%$ = 86%	61	$\overline{X}\%$ = 62%

glasses. Three different flavors of gelatin were presented to each S. Each glass of gelatin was covered with a clear plastic wrap and was placed on a 7 inch diameter white paper plate. Each plate was numbered 1, 2, or 3. Each glass had its own white plastic spoon. A commercial scale was used to weigh each S at the completion of the procedure. A small spring scale was used to measure each glass of gelatin at the conclusion of the procedure in order to measure the amount of gelatin eaten.

(2.3) Procedure:

(2.3-1) Subject solicitation

All Ss were solicited under the guise that this research had been contracted for by a large food manufacturer. At the time of the initial contact with each S, E read the following:

> My name is Mr. Ford. I am a psychologist doing research with the Department of Psychology at the University of Massachusetts. We have been commissioned by a large food company to test a brand new calorie free snack. This food company is interested in finding out what people's reactions are to the various flavors that they will be marketing. Because a person's dieting and/or weight history is important in determining their taste preferences, I will be asking you some questions about your weight history, should you decide to participate. If you volunteer you will be paid $2.00 for roughly an hours worth of time. During this time you will simply taste and rate the desserts. Further if you volunteer it will be necessary that you do not eat for 4 hours (but not more than 6 hours) prior to your participation because another important factor in determining how things taste is what you have recently eaten.

For those Ss who were solicited in groups and who subsequently volunteered, each was telephoned individually to set up an appointment. They were then asked the following questions:

1. What is your height?
2. What is your weight?
3. What is your age?
4. Are you currently on a diet?
5. If not, when was the last time you dieted?

E then said: In order to schedule an appointment for you, I will need some idea of your daily schedule:

1. What time do you get up in the morning?
2. What time do you eat lunch?
3. What time do you eat supper?

For those subjects who were solicited individually and who volunteered, an appointment was set up and they were also asked the above questions. The day before her appointment, each S was reminded of her appointment, either in person or by telephone.

(2.3-2) Experimental procedure

The experimental sessions were scheduled one hour prior to the time indicated as each Ss usual dinner or supper hour. The Ss were not specifically told that the appointments were being set up in such a manner nor were they told of the kind of dessert they would be tasting.

Each S was taken into the experimental rooms and seated by E. E then asked, "Do you have a watch?" If the S answered "yes", E asked, "Could I borrow it? I left mine at home and I need one for timing purposes." All wristwatch wearing Ss gave up their watches, with none voicing or indicating any objections.

A folder was placed on each desk. After each S was seated, E said,

> This first form is a form that I send to your personal physician requesting whatever height and weight information he might have of you over the past two years. As was indicated to you previously, this kind of information is important in this kind of work. I need your physician's name and address here, and your name here and here. (This form appears in Appendix 1. The physician's reply card also appears in Appendix 1.)

After the S completed the Release of Information form, E said,

> All the forms you will need for the first part of this study are in this folder. All of the forms have self-administering instructions, so continue to work on them until you reach the blank page. Once you reach the blank page, stop. Should you finish before the time limit is up, simply remain in the room until I return.

The forms in the booklet included:

1. A statement for the S to sign indicating that she had not eaten in the past 4 hours (see Appendix 1).
2. An introductory statement to the S (see Appendix 1).
3. A confidential Background Information Form (see Appendix 1).
4. Semantic Differential Instructions and forms (see Appendix 1).

The Semantic Differential was included to give the Ss a task to perform during the time manipulation period. The following 8 concepts were included in the Semantic Differential:

> Diet, Food, Obesity, Dessert, Calories, Me as I am, Me as others see me, Me as I would like to be

The evaluative dimension was measured with the following bi-polar adjectives: pleasant-unpleasant; tasty-distasteful; fair-unfair; nice-awful. The potency dimension was measured with: large-small; heavy-light; strong-weak. Finally, the activity dimension was measured with the following bipolar adjectives: fast-slow; active-passive; hot-cold.

After a true 30 minutes, E returned with the three glasses of diet gelatin. E said,

> You will note that there is a number on each plate. Make sure that you keep this number consistent with the number that appears at the top of the rating forms, which are beyond the blank page. Many people have thought this to be an easy task, but most have found it to be more difficult than they thought, so be prepared to take about 20 minutes, or until it is ____ (E added 20 minutes to the time on the clock). Feel free to sample as much as you need in order to make an accurate rating. I will return at the end of the 20 minutes. (The rating forms appear in Appendix 1).

(2.3-3) Manipulation of Time

From the time the E left the Ss in the experimental room, the flow of events was scheduled so that, by use of the modified clocks, the dessert tasting period appeared to fall well before or during the Ss usual dinner or supper time. Seven of the Ss from each weight-set point designation group were randomly assigned to the early condition and 7 were assigned to the late condition. Thus half of the Ss were under the impression that they were tasting the desserts during their usually scheduled time and the other half were under the impression that they were eating before their usually scheduled time.

The exact sequence of events and its relation to both true time and the clock readings in the fast and slow time conditions is presented below:

TRUE TIME	EVENT	SLOW CLOCK	FAST CLOCK
X:00-X:05	S arrives, receives instructions, watch removed	X:00-X:05	X:00-X:05
X:05-X:35	Questionnaire period; S alone	X:05-X:20	X:05-X+1:05
X:35-X:40	S receives further instructions and gelatin	X:20-X:25	X+1:05-X+1:10
X:40-X+1	S alone tasting and rating	X:25-X:45	X+1:10-X+1:30

The clock rate was varied only during the true 30 minute long Questionnaire period.

At the end of the experimental session the Ss were individually asked the following questions by E:

1. Do you have any comments?
2. What time was it when you came into this room?
3. What time is it now? (E covered the clock face).
4. How long did it seem you were here?
5. Did you notice anything in particular about the clock?
6. Did you hold back tasting the desserts so as not to spoil your supper/dinner?

If any S verbalized something concerning the time manipulation, they were not included in the present data. This included any verbalized suspicions of the accuracy of the clock.

During this period, the Ss were questioned about their incomes and dependents to get as accurate a report of these items as possible. The Ss were also questioned further to determine in which set point classification they belonged.

The S was then weighed and asked to sign a paper indicating that she would not discuss the study with anyone until she was notified that it was completed (see Appendix 1). The S was then paid $2.00 and she was asked to sign a receipt for the money. The S was then debriefed; this debriefing included a complete description of the deception and the reasons why it was necessary.

(2.3-4) Subject Placement

Ss were placed in the Below Set point groups (both diet and non-diet) based both on their self-report and on their physician's records. When there was a conflict between the S's report and the phy-

sician's report, the physician's report was used. No height discrepancies were found, however.

Often Ss would claim to be on a diet but it was patently obvious that this could not be the case. For example, one S reported losing 20 pounds on a recent diet. She reported that her current weight was 140 pounds. When weighed at the end of the experimental procedure she weighed 170 pounds. Certainly her reliability in reporting her dieting history was less than ideal. Because social pressures and expectations lead many overweight people to claim to be on a diet, the placement of Ss into the Diet groups was difficult. Generally it was easiest with those who belonged to the diet organizations, although problems even arose with them. For example, one S from Diet Workshop reported being a member of that organization for a year. Her actual measured weight was greater than her reported average weight of the past 2 years! On the whole placing Ss into the Set Point groups was much easier, because the great majority of them did not claim to be on diets. In sum, placement into the various experimental groups, especially the Below Set Point groups, was somewhat difficult and probably somewhat unreliable.

(3.0) Results

(3.1) Hypotheses

To review, the hypotheses for the Main part of this study were:

1. Ss Below Set Point will eat significantly more than Ss At Set Point.

2. Ss who think the experimental session is after dinner will eat significantly more than Ss who think it is before dinner.

3. (a) Ss Below Set Point will eat significantly more than Ss at Set Point when they think it is before dinner time.
   (b) Ss Below Set Point will eat significantly less than Ss At Set Point when they think it is after dinner time.
   (c) This is predicted regardless of the Ss absolute weight or degree of overweight.

(3.2) Main Data Analysis

(3.2-1) Amount Eaten

The main dependent variable in this study was the amount eaten by the various experimental groups under conditions where they were lead to believe the time to be later than it actually was and under conditions where they believed the time to be earlier than it was.

The mean amount eaten in grams by each group and their variances appear in Table 12. The means are also presented graphically in Figure 1. Hartley's test was performed and the obtained value was 4.36 (a=12, 6 df). This value, being nonsignificant, indicated that the variances were homogeneous. An ANOVA was performed to determine if there were any significant differences among the groups according to the amount eaten. This analysis is summarized also in Table 12.

Table 12

Mean Amount Eaten for Each Group and Their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Pt.	145.71(1335.57)	112.57(5069.62)	
Below Set Pt.	160.29(1841.24)	137.29(2150.95)	$\bar{X}$ High Obese = 138.96

Moderate Obese

	Fast Clock	Slow Clock	
At Set Pt.	66.29(2363.24)	149.14(2939.14)	
Below Set Pt.	105.57(3295.29)	169.29(2578.24)	$\bar{X}$ Mod. Obese = 122.57

Normal Weight

	Fast Clock	Slow Clock	
At Set Pt.	184.43(5153.29)	115.00(5816.67)	
Below Set Pt.	187.14(3732.14)	115.57(4179.62)	$\bar{X}$ Normal = 150.54

$\bar{X}$ At Set Point = 128.86 $\bar{X}$ Fast Clock = 141.57

$\bar{X}$ Below Set Point = 145.86 $\bar{X}$ Slow Clock = 133.14

Hartley's test = 4.36 (a=12, 6 df)

Analysis of Variance for Amount Eaten

Source	df	MS	F
Weight Group	2	5528.25	1.56
Set Point Class.	1	6069.00	1.71
Clock Speed	1	1491.86	<1
Weight Group X Set Point Class.	2	1415.86	<1
Weight Group X Clock Speed	2	38205.75	10.79(p<.001)
Set Point Class. X Clock Speed	1	72.42	<1
Weight Group X Set Point Class. X Clock Speed	2	378.46	<1
Error	72	3540.44	

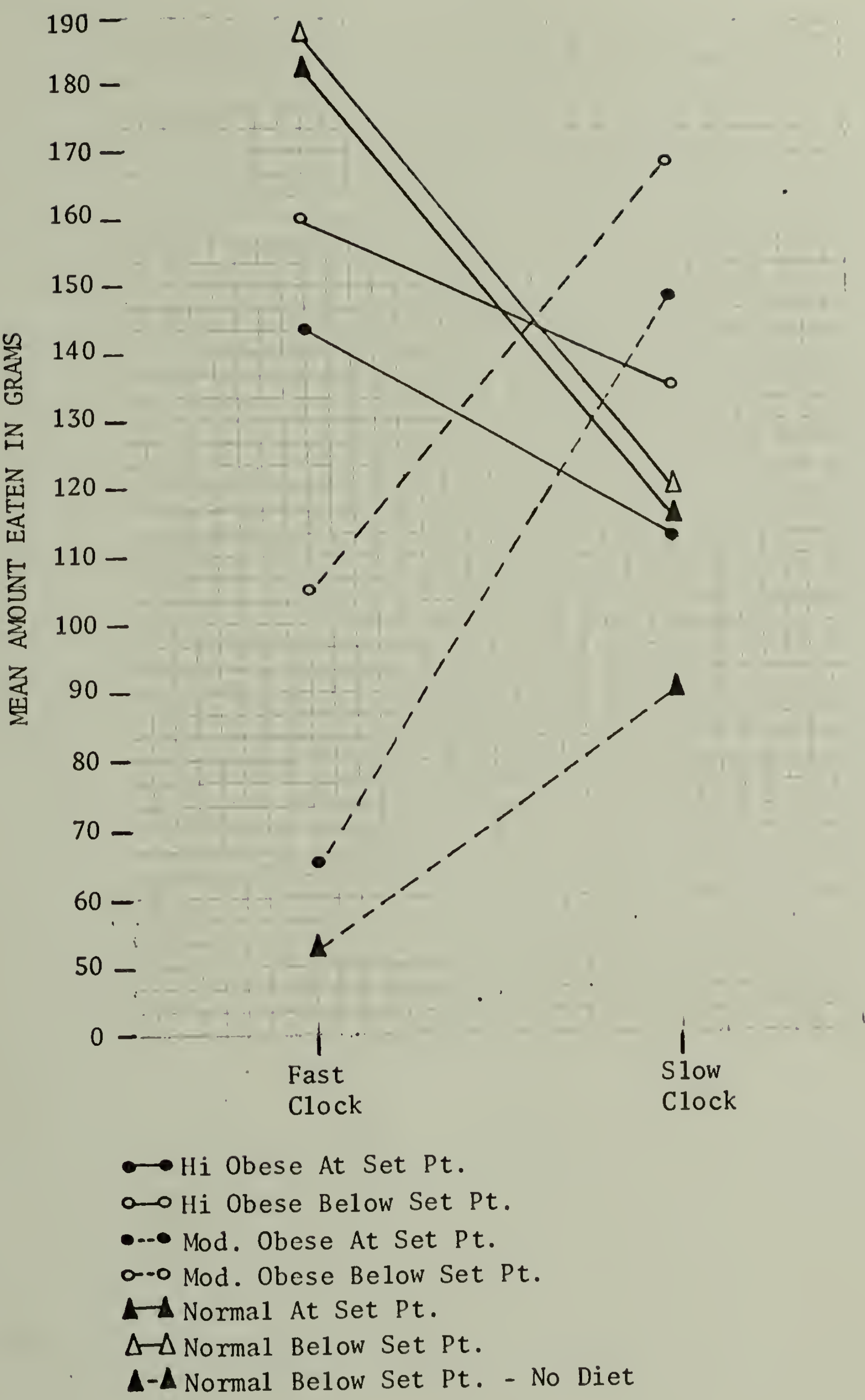

Fig. 1 - MEAN AMOUNT EATEN IN GRAMS BY EACH GROUP

An inspection of these results will bear directly on the main hypotheses of Section 3.1. No statistically significant effect was found which would support Hypothesis 1. This would require a significant Set Point classification effect. That is, Ss Below Set Point did not eat significantly more than Ss At Set Point.

Hypothesis 3(a) was also unsupported. Ss Below Set Point did not eat significantly more than Ss At Set Point when they thought it was before dinner. Hypothesis 3(c) also was unsupported; thus the predicted critical interaction was not found. That is, the eating behavior of Ss Below Set Point was not influenced by the external time cue significantly more than the behavior of the Ss At Set Point.

There was a significant ($p<.001$) interaction between the Degree of Overweight variable and the Clock Speed variable. The means of this effect are provided in Table 13. The interaction is also presented graphically in Figure 2. In order to determine which differences among these means were significant, the Newman-Kuels procedure for post hoc comparisons was used. The results of these comparisons appear in Table 14. The comparisons indicate that Clock Speed had no effect on the amount eaten by the High Obese Ss. However, when the Moderately Obese Ss perceived it to be before their usual dinner time, they ate significantly more ($p<.05$) than when they perceived it to be during their usual dinner time. In contrast, when the Normal Weight Ss perceived it to be before their usual eating time, they ate significantly less ($p<.05$) than when they perceived it to be during their usual time of eating. That is, there was a reversal of effect between the Moderately Obese and Normal weight Ss. Further the

Table 13

Mean Amount Eaten in Grams for the Significant Degree of Overweight X Clock Speed Variables

	Fast Clock	Slow Clock
High Obese	153.00	124.93
Moderate Obese	85.93	159.21
Normal	185.79	115.29

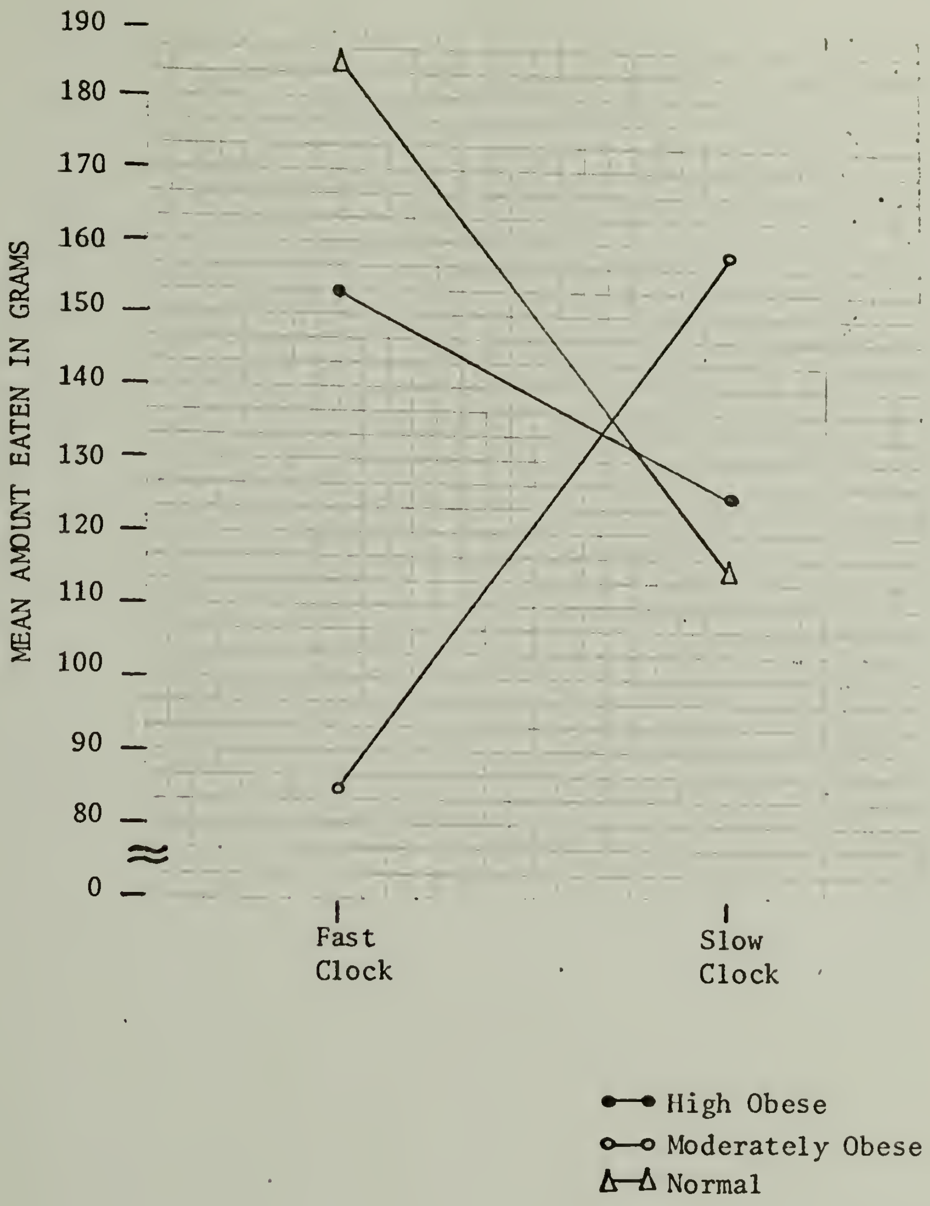

Fig. 2 - SIGNIFICANT DEGREE OF OVERWEIGHT X CLOCK SPEED INTERACTION

Table 14

Contrasts Among the Means of the Significant Degree of Overweight X Clock Speed Effect

$\overline{X}_{A_2C_1}$ = 85.93	$\overline{X}_{A_3C_2}$ = 115.29	$\overline{X}_{A_1C_2}$ = 124.93
$\overline{X}_{A_1C_1}$ = 153.00	$\overline{X}_{A_2C_2}$ = 159.21	$\overline{X}_{A_3C_1}$ = 185.79

Differences among the means:

	$\overline{X}_{A_3C_2}$	$\overline{X}_{A_1C_2}$	$\overline{X}_{A_1C_1}$	$\overline{X}_{A_2C_2}$	$\overline{X}_{A_3C_1}$
$\overline{X}_{A_2C_1}$	29.36	39.00	67.07 ($p<.05$)	73.28 ($p<.05$)	99.86 ($p<.05$)
$\overline{X}_{A_3C_2}$		9.64	37.71	43.92	70.50 ($p<.05$)
$\overline{X}_{A_1C_2}$			28.07	34.28	60.86 ($p<.05$)
$\overline{X}_{A_1C_1}$				6.21	32.79
$\overline{X}_{A_2C_2}$					26.58

Newman-Kuels critical values:

6 steps = 67.27
5 steps = 64.24
4 steps = 60.27
3 steps = 54.70

A_1 = High Obese
A_2 = Moderate Obese
A_3 = Normal
C_1 = Fast Clock
C_2 = Slow Clock

Moderately Obese ate significantly less (p<.05) in the Fast Clock condition than did either the High Obese or Normal Weight Ss. That is, when the Moderately Obese perceived it to be during their usual dinner time, they ate significantly less than either the High Obese or the Normal Weight. Finally, the Normal Weight Ss in the Fast Clock condition ate significantly more (p<.05) than the High Obese in the Slow Clock condition. All three groups ate statistically the same amount in the Slow Clock condition.

In order to investigate the interaction further, the difference between the amounts eaten in the Fast Clock and Slow Clock conditions and the direction of such differences were contrasted for the 3 weight groups. The difference between the amount eaten in the Slow Clock and the amount eaten in the Fast Clock conditions by the High Obese S (-28.07 grams) and the Moderately Obese Ss (73.29 grams) was significant (F=10.16; p<.05, 2 and 72 df) after adjusting the Error Rate Experimentwise by using the Scheffe' test (critical F=6.30, α=.05, 2 and 72 df) for post hoc comparisons (Myers, 1972, p. 376). Thus the effect of the Clock Manipulation changed significantly over these 2 levels of the Degree of Overweight variable. The difference between the amounts eaten in the Fast Clock and Slow Clock conditions by the High Obese Ss (-28.07 grams) and the Normal Weight Ss (-70.5 grams) was not significant (F=1.78; 2 and 72 df). Finally, the difference between the amounts eaten in the Fast and Slow Clock conditions be the Moderately Obese Ss (73.29 grams) and the Normal Weight Ss (-70.5 grams) was significant (F=20.44, p<.05; 2 and 72 df). In sum, the significant interaction effect was due primarily to the

<u>increase in amount eaten between the Fast Clock to Slow Clock conditions for the Moderately Obese Ss as compared to the decrease for the High Obese and Normal Weight Ss</u>. This interaction also helps to explain in part the lack of a significant Clock Speed effect. The significant increase for the Moderately Obese from Fast to Slow Clock conditions was enough to offset the significant decrease for the Normal Weight from Fast to Slow Clock conditions and the nonsignificant decrease for the High Obese.

The differences between the absolute value of the amounts eaten in the Fast Clock and Slow Clock conditions were contrasted for the High Obese, Moderately Obese, and Normal Weight groups. This was done in order to determine if there was significant differential sensitivity among the groups to the Clock Speed manipulation. The difference between the absolute value of the amounts eaten in the Slow Clock and Fast Clock conditions by the High Obese Ss (28.07 grams) and the Moderately Obese Ss (73.29 grams) was not significant (F=2.20; 2 and 72 df) after adjusting the Error Rate Experimentwise by using the Scheffe' test. Similarly the difference between the absolute amounts eaten in the Slow Clock and Fast Clock conditions by the High Obese Ss (28.07 grams) and the Normal Weight Ss (70.5 grams) was also not significant (F=1.78; 2 and 72 df). Finally the difference between the absolute amounts eaten in the Slow Clock and Fast Clock conditions by the Moderately Obese Ss (73.29 grams) and the Normal Weight Ss (70.5 grams) was nonsignificant (F=.008; 2 and 72 df). Thus none of the groups were significantly more sensitive in terms of amount eaten to the clock manipulation than any other.

These findings bear on Hypothesis 2 of Section 3.1. While it is true that the manipulation of time affected the amount eaten by the Normal Weight Ss and the Moderately Obese Ss (but not the High Obese Ss) the effect was not always in the predicted direction. In fact, for the Moderately Obese Ss, the actual effect was opposite to that predicted; i.e., they ate more when they perceived it to be before their dinner time than when they perceived it to be after their dinner time.

(3.2-1.1) Summary

Hypotheses 1 and 3 of Section 3.1 were unsupported. Hypothesis 2 was partially supported. The actual findings were:

1. When the Moderately Obese Ss perceived it to be before their usual dinner time, they ate significantly more ($p<.05$) than when they perceived it to be during their usual dinner time. In contrast, when the Normal Weight Ss perceived it to be before their usual eating time, they ate significantly less ($p<.05$) than when they perceived it to be during their usual time of eating.

2. The Moderately Obese ate significantly less ($p<.05$) in the Fast Clock condition than did either the High Obese or Normal Weight Ss. Even though the Moderately Obese ate less in the Fast Clock condition than any other group, they did not eat significantly less than the smallest amount eaten by the Normal Weight Ss (in the Slow Clock condition).

3. The Normal Weight Ss in the Fast Clock condition ate significantly more ($p<.05$) than the High Obese in the Slow Clock condition.

4. The clock manipulation had no significant effect on the amount eaten by the High Obese Ss.

5. The significant interaction effect was due primarily to the increase in amount eaten between the Fast Clock to Slow Clock conditions for the Moderately Obese Ss as compared to the decrease for the High Obese and Normal Weight Ss.

From this point on, several variables which might possibly be related to the amount eaten and both the internal and external hypotheses will be discussed and evaluated.

(3.2-2) Hunger Rating

On an intuitive level it can be predicted that the Ss' degree of hunger should affect the amount they eat. On the basis of the internal hypothesis, modified by Nisbett's 1972 ideas (c.f., Section 1.5), significant positive correlations between Hunger Rating and amount eaten would be expected for Ss At Set Point. In order to investigate the relationship between Hunger Rating and amount eaten for all groups, Pearson product moment correlations were performed. The obtained correlation coefficients appear in Table 15. As can be seen, there was no significant overall correlation ($r=.18$, 82 df). There was a significant ($p<.05$) correlation ($r=.81$, 5 df) between Hunger Rating and amount eaten for the Normal Weight Below Set Point-Diet group. The presence of only one such significant correlation is less

Table 15

Correlations between Hunger Ratings and Amount Eaten per Group
(Mean amount eaten appears in parentheses)

	Fast Clock	Slow Clock
High Obese		
At Set Point	r = -.09(145.71)	r = .29(112.57)
Below Set Point	r = -.45(160.29)	r = .25(137.29)
Moderate Obese		
At Set Point	r = .43(66.29)	r = .47(149.14)
Below Set Point	r = .07(105.57)	r = -.07(169.29)
Normal Weight		
At Set Point	r = -.60(184.43)	r = -.11(115.00)
Below Set Point	r = .36(187.14)	r = .81(115.57)*

Overall r = .18

* p<.05

than convincing support in favor of Nisbett's revised internal hypothesis.

Based again on Nisbett's modified internal hypothesis, it can also be predicted that the mean Hunger Ratings of the Below Set Point-Diet Ss should be higher than that of the At Set Point Ss because of the former's "chronic hunger". An ANOVA was performed on the Hunger Ratings to determine if there were any significant differences among the groups. The results of this analysis appear in Table 16. These results indicate no significant differences among the various groups with regard to the Ss' Hunger Ratings. The modified Nisbett internal hypothesis was again not supported. The Below Set Point-Diet Ss did not rate their hunger as significantly greater than the At Set Point-Diet Ss. The overall Hunger Rating was 2.82 (between "A little" and "Moderately").

(3.2-3) Taste Rating

On the basis of the modified Nisbett external hypothesis, a significant positive correlation can be predicted between Taste Rating and the amount eaten by the Below Set Point-Diet Ss. Pearson r's were again obtained to investigate this relationship. The results appear in Table 17. As can be seen, there was no significant overall correlation (r=.09, 82 df) between the Ss' Taste Ratings and the amount eaten. This was true for each individual treatment group also. The prediction of a positive correlation between Taste Rating and amount eaten for the Below Set Point-Diet Ss was not confirmed.

Table 16

Mean Hunger Ratings and Their Variances
(Variances appear in parentheses)

High Obese	Fast Clock	Slow Clock	
At Set Point	2.57(.29)	2.86(1.14)	
Below Set Point	2.57(.29)	3.29(1.90)	$\overline{X}$ High Obese = 2.82
Moderate Obese	**Fast Clock**	**Slow Clock**	
At Set Point	2.29(1.90)	3.00(.33)	
Below Set Point	2.57(1.29)	2.71(1.57)	$\overline{X}$ Moderate Obese = 2.64
Normal Weight	**Fast Clock**	**Slow Clock**	
At Set Point	3.29(1.24)	2.71(1.24)	
Below Set Point	2.86(1.14)	3.14 (.81)	$\overline{X}$ Normal = 3.00

$\overline{X}$ At Set Point = 2.79 $\overline{X}$ Fast Clock = 2.69

$\overline{X}$ Below Set Point = 2.86 $\overline{X}$ Slow Clock = 2.95

Hartley's test = 6.67 (a=12, 6 df)

Analysis of Variance for Hunger Ratings

Source	df	MS	F
Weight Group	2	5528.25	1.56
Set Point Class.	1	6069.00	1.71
Clock Speed	1	1491.86	<1
Weight Group X Set Point Class.	2	1415.86	<1
Weight Group X Clock Speed	2	38205.75	10.79($p<.001$)
Set Point Class. X Clock Speed	1	72.42	<1
Weight Group X Set Point Class. X Clock Speed	2	378.46	<1
Error	72	3540.44	

Table 17

Correlations Between Taste Ratings and Amount Eaten per Group
(Mean Amount Eaten appears in parentheses)

High Obese

	Fast Clock	Slow Clock
At Set Point	r = .25(145.71)	r = .62(112.57)
Below Set Point	r = -.56(160.29)	r = -.26(137.29)

Moderate Obese

	Fast Clock	Slow Clock
At Set Point	r = .32 (66.29)	r = .15(149.14)
Below Set Point	r = .29(105.57)	r = .43(169.29)

Normal Weight

	Fast Clock	Slow Clock
At Set Point	r = .35(184.43)	r = .32(115.00)
Below Set Point	r = .22(187.14)	r = 0.19(115.57)

Overall r = .09

The mean Taste Ratings and their variances per group plus an ANOVA performed on the data appear in Table 18. The results indicate a significant difference according to the Clock Speed variable. Those Ss in the Slow Clock condition rated the desserts as tasting significantly better ($p<.05$) than those Ss in the Fast Clock condition. Both Taste Ratings fell between "Not Very Good" and "Fairly Good", as did the overall Taste Ratings of all Ss. The Clock Speed finding is interesting in that there does not seem to be an immediately obvious reason for such a Taste Rating difference.

(3.2-4) Color Rating

In order to determine if there was a significant relationship between Color Rating and amount eaten, correlations were again performed. The results appear in Table 19. As can be seen, there was no significant relationship (overall $r=-.09$, 82 df) between Color rating and amount eaten.

The mean Color Ratings of each group and their variances appear in Table 22. Hartley's test was performed. The obtained value was 20.75 (a=12, 6 df). This was significant ($p<.05$) indicating the variances were heterogeneous. It was felt, however, that the information to be obtained from an analysis of variance of this data was not of major importance; thus it was decided not to transform the data in an attempt to make the variances more homogeneous. Further, some statisticians feel that the various tests of homogeneity of variance are ". . . overly sensitive to departures from normality" (Myers, 1972, p. 72) and thus recommend against their use. In order to err

Table 18

Mean Taste Ratings and Their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	3.90 (.58)	3.85(.33)	
Below Set Point	3.33(1.15)	4.09(.36)	$\bar{X}$ High Obese = 3.80

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	3.24(1.54)	3.95(.61)	
Below Set Point	3.95(.87)	3.81(.29)	$\bar{X}$ Moderate Obese = 3.74

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	2.90(1.69)	3.81(.11)	
Below Set Point	3.76(.17)	3.76(.66)	$\bar{X}$ Normal = 3.56

$\bar{X}$ At set point = 3.61 $\bar{X}$ Fast Clock = 3.51

$\bar{X}$ Below set point = 3.78 $\bar{X}$ Slow Clock = 3.88

Hartley's test = 15.88 (a=12, 6 df)

Analysis of Variance for Taste Ratings

Source	df	MS	F
Weight Group	2	.43	<1
Set Group Class	1	.64	<1
Clock Speed	1	2.81	4.03(p<.05)
Weight Group X Set Point Class	2	.63	<1
Weight Group X Clock Speed	2	.05	<1
Set Point Class X Clock Speed	1	.52	<1
Weight Group X Set Point Class, X Clock Speed	2	.67	<1
Error	72	.70	

Table 19

Correlations Between Color Rating and Amount Eaten per Group
(Mean amount eaten appears in parentheses)

High Obese

	Fast Clock	Slow Clock
At Set Point	r = .02(145.71)	r = -.29(112.57)
Below Set Point	r = .13(160.29)	r = -.15(137.29)

Moderate Obese

	Fast Clock	Slow Clock
At Set Point	r = .50(66.29)	r = .13(149.14)
Below Set Point	r = .31(105.57)	r = -.27(169.29)

Normal Weight

	Fast Clock	Slow Clock
At Set Point	r = .26(184.43)	r = .18(115.00)
Below Set Point	r = -.53(187.14)	r = .40(115.57)

Overall r = -.09

on the side of caution, however, Hartley's test has been performed and should alert the reader to interpret with like caution the findings where the test is significant. With this in mind, an ANOVA was performed on the Color Rating Data, and is summarized in Table 20. It is apparent that there were no significant differences among the groups according to Color Rating. The overall Color Rating fell between "A little weak" and "Just about right".

(3.2-5) Sweetness Rating

In order to determine if there was a significant relationship between the Sweetness Ratings and amount eaten, correlations were again performed. The results appear in Table 21. There was no significant relationship between Sweetness Ratings and amount eaten. The mean Sweetness Ratings of each group and their variances appear in Table 22. An ANOVA performed on the data also is summarized in Table 22. It can be seen that there were no significant differences among the groups according to Sweetness Ratings. The mean overall Sweetness Rating was "A little sweet".

(3.2-6) Subjects' Income

In an effort to determine if there was any significant relationship between the Ss' income (c.f. Section 2.1-1) and amount eaten, correlations were again performed. The results appear in Table 23. No significant correlations, either overall (r=.07, 82 df), or per group, were found between the Ss' income and the amount eaten.

Table 20

Mean Color Ratings and Their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	2.76(.06)	2.85(.11)	
Below Set Point	2.81(.07)	2.28(.57)	$\bar{X}$ High Obese = 2.68

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	2.86(.07)	2.57(.47)	
Below Set Point	2.90(.06)	2.81(.26)	$\bar{X}$ Mod. Obese = 2.78

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	2.86(.14)	2.90(.03)	
Below Set Point	2.57(.29)	2.95(.20)	$\bar{X}$ Normal = 2.82

$\bar{X}$ At Set Point = 2.80 $\bar{X}$ Fast Clock = 2.79

$\bar{X}$ Below Set Point = 2.72 $\bar{X}$ Slow Clock = 2.73

Hartley's test = 20.75 (a=12, 6 df)

Analysis of Variance for Color Ratings

Source	df	MS	F
Weight Group	2	.50	<1
Set Point Class.	1	.61	<1
Clock Speed	1	.45	<1
Weight Group X Set Point Class.	2	1.53	1.53
Weight Group X Clock Speed	2	2.11	2.11
Set Point Class. X Clock Speed	1	.77	<1
Weight Group X Set Point Class. X Clock Speed	2	2.47	2.47
Error	72	1.00	

Table 21

Correlations between Sweetness Ratings and Amount Eaten per group
(Mean amount eaten appears in parentheses)

High Obese

	Fast Clock	Slow Clock
At Set Point	r = -.18(145.71)	r = -.05(112.57)
Below Set Point	r = -.54(160.29)	r = .04(137.29)

Moderate Obese

	Fast Clock	Slow Clock
At Set Point	r = .53(66.29)	r = .01(149.14)
Below Set Point	r = .03(105.57)	r = .51(169.29)

Normal Weight

	Fast Clock	Slow Clock
At Set Point	r = .14(184.43)	r = .28(115.00)
Below Set Point	r = .53(187.14)	r = .13(115.57)

Overall correlation = .08

Table 22

Mean Sweetness Ratings and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	1.85(.40)	1.71(.53)	
Below Set Point	1.86(.62)	2.52(1.56)	$\bar{X}$ High Obese = 1.99

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	2.09(.66)	1.81(.25)	
Below Set Point	2.19(.77)	2.00(.26)	$\bar{X}$ Moderate Obese = 2.02

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	2.05(1.60)	1.90(.29)	
Below Set Point	2.19(.59)	1.95(.46)	$\bar{X}$ Normal = 2.02

$\bar{X}$ At set point = 1.90 $\bar{X}$ Fast Clock = 2.04

$\bar{X}$ Below set point = 2.12 $\bar{X}$ Slow Clock = 1.98

Hartley's test = 6.33 (a=12, 6 df)

Analysis of Variance for Sweetness Ratings

Source	df	MS	F
Weight Group	2	.01	<1
Set Group Class	1	.96	1.46
Clock Speed	1	.07	<1
Weight Group X Set Point Class	2	.20	<1
Weight Group X Clock Speed	2	.53	<1
Set Point Class X Clock Speed	1	.38	<1
Weight Group X Set Point Class, X Clock Speed	2	.39	<1
Error	72	.66	

Table 23

Correlations between Subject's Income and Amount Eaten per group
(Mean amount eaten appears in parentheses)

High Obese

	Fast Clock	Slow Clock
At Set Point	r = -.06(145.71)	r = -.24(112.57)
Below Set Point	r = .29(160.29)	r = -.05(137.29)

Moderate Obese

	Fast Clock	Slow Clock
At Set Point	r = .29(66.29)	r = .26(149.14)
Below Set Point	r = .26(105.57)	r = -.08(169.29)

Normal Weight

	Fast Clock	Slow Clock
At Set Point	r = .57(184.43)	r = -.49(115.00)
Below Set Point	r = .32(187.14)	r = .16(115.57)

Overall r = .07

(3.2-7) Subject's Actual Weight

To determine if there was a significant relationship between amount eaten and the Ss' actual weight, correlations were performed between these variables. The results are summarized in Table 24. There was no significant overall correlation ($r=.00072$, 82 df) between the Ss' actual weight and amount eaten. There was, however, a significant positive correlation ($r=.76$; 5 df; $p<.05$) between the Ss' actual weight and amount eaten for the Moderately Obese Below Set Point-Diet Fast Clock Group. A negative correlation ($r=-.74$; 5 df) approaching statistical significance ($p<.10$) was found for the Moderately Obese Below Set Point-Diet Slow Clock group. Thus for the Moderately Obese Below Set Point-Diet Fast Clock group, the more they weighed the more they ate. For the Moderately Obese Below Set Point-Diet Slow Clock group, the more they weighed, the less they ate.

(3.2-8) Summary of Correlation Data

There were no significant overall correlations between amount eaten and: Hunger Ratings, Color Ratings, Ss' Income or the Ss' Actual Weight. Thus these variables were not significantly adding to the error variance in the ANOVA of the amount eaten data.

Two significant intracell correlations, and one intracell correlation approaching statistical significance were found. The first significant correlation involved a positive relation between amount eaten and Hunger Ratings for the Normal Weight Below Set Point-Diet Slow Clock group. The other significant correlation involved a positive relationship between the Ss' actual weight and amount eaten for

Table 24

Correlations between Subject's Actual Weight and Amount Eaten per group
(Mean amount eaten appears in parentheses)

High Obese

	Fast Clock	Slow Clock
At Set Point	r = .64(145.71)	r = -.35(112.57)
Below Set Point	r = -.30(160.29)	r = .49(137.29)

Moderate Obese

	Fast Clock	Slow Clock
At Set Point	r = .48(66.29)	r = -.27(149.14)
Below Set Point	r = .76(105.57)*	r = -.74(169.29)**

Normal Weight

	Fast Clock	Slow Clock
At Set Point	r = .38(184.43)	r = .32(115.00)
Below Set Point	r = -.43(187.14)	r = -.12(115.57)

Overall r = .00072

* p<.05
** p<.10

the Moderately Obese Below Set Point-Diet Fast Clock group. The correlation approaching significance involved a negative relationship between the Ss' actual weight and amount eaten for the Moderately Obese Below Set Point-Diet Slow Clock group.

However, a total of 72 intragroup correlations were performed. On the basis of chance at the 5% level, 3.6 correlation coefficients could be expected to be significant. Thus the two correlations which were significant and the one which approached significance are probably attributable to chance. On that basis, they should be interpreted with caution. Finally, these significant findings seem to have no theoretical importance.

(3.2-9) Summary of Analyses of Variance Data

There were no significant differences among the various treatment groups with regard to the Ss' Hunger Ratings. The Ss in the Slow Clock condition rated the desserts as tasting significantly better ($p<.05$) than those Ss in the Fast Clock condition. No significant effects were found for either the Color Ratings or the Sweetness Ratings. The overall Hunger Rating fell between "A little" and "Moderately". The overall Taste Rating fell between "Not Very Good" and "Fairly Good". The overall Color Rating fell between "A little weak" and "Just about right".

(3.3) Weight Discrepancy

In order to assess the accuracy of the Ss' weight reporting, their actual measured weight was subtracted from their reported

weight. The mean differences appear in Table 25. Hartley's test revealed a significant heterogeneity of variance (82.64; $p<.01$; $a=12$; 6 df). As a result of this, any interpretations made from further analysis of this data should be made cautiously. The summary of an ANOVA performed on these weight discrepancies appears in Table 25. These results indicate a significant ($p<.01$) Set Point Classification effect. Ss At Set Point underreported their actual weight to a significantly greater degree than did Ss Below Set Point-Diet. This is reasonable because most Below Set Point-Diet Ss were forced to keep close record of their weight as a function of the "weigh-ins" required by the diet organizations to which they belonged, making them more accurate reporters than Ss At Set Point who had no comparable reason to keep close record of their weight. This interpretation is offered with caution because of the significant heterogeneity of group variances.

(3.4) Control Hypotheses

To briefly review, the hypotheses for the Control part of this study were:

a. Both groups of Normal Weight Ss who are Below Set Point will eat significantly more than the Ss At Set Point.

b. Ss who think the experimental session is after dinner will eat significantly more than Ss who think it is before dinner.

c. The Ss Below Set Point (Diet and No Diet) will eat significantly more than Ss At Set Point when they think it is after dinner time. Ss Below Set Point (Diet and No Diet) will eat significantly less than Ss At Set Point when they think it is before dinner time.

Table 25

Mean Weight Discrepancies and their Variances
(Negative values indicate that the Ss underreported their weights;
Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Pt.	-7.86(84.95)	-13.86(165.29)	
Below Set Pt.	-2.57(61.29)	-1.43 (12.95)	$\bar{X}$ High Obese = -6.43

Moderate Obese

	Fast Clock	Slow Clock	
At Set Pt.	-6.29(57.81)	-7.86 (77.48)	
Below Set Pt.	-4.14(34.81)	-2.00 (32.33)	$\bar{X}$ Mod. Obese = -5.07

Normal Weight

	Fast Clock	Slow Clock	
At Set Pt.	-3.86(19.81)	-1.00 (2.00)	
Below Set Pt.	-1.43(28.29)	-1.00 (2.90)	$\bar{X}$ Normal = -1.75

$\bar{X}$ At Set Point = -6.26 $\bar{X}$ Fast Clock = -3.88

$\bar{X}$ Below Set Point = -2.05 $\bar{X}$ Slow Clock = -4.42

Hartley's test = 82.64 (a=12, 6 df)

Analysis of Variance for Weight Discrepancy

Source	df	MS	F
Weight Group	2	133.01	2.75
Set Point Class.	1	372.96	7.72($p<.01$)
Clock Speed	1	6.30	<1
Weight Group X Set Point Class.	2	81.75	1.69
Weight Group X Clock Speed	2	40.15	<1
Set Point Class. X Clock Speed	1	74.30	1.54
Weight Group X Set Point Class. X Clock Speed	2	50.08	1.04
Error	72	48.33	

(3.4-1) Amount Eaten

The main dependent variable was again the amount eaten. The mean amount eaten in grams by each group appears in Table 26. The value for Hartley's test was 2.46 (a=6, 6 df), which is not significant. An ANOVA was performed on the amount eaten and it is summarized in Table 27. As can be seen, there was a significant effect due to Set Point Classification. In order to determine which means were significantly different, contrasts between the 3 Set Point Classification means were performed. The procedure used was that suggested by Myers (1972, p. 362) for nonorthogonal planned comparisons. The Error Rate Experimentwise (EW) was set at .05. The results appear in Table 27. These results do not support Hypothesis a of Section 3.4. That is, both groups of normal weight Ss who were Below Set Point did not eat significantly more than Ss At Set Point. In fact, the Normal Weight Below Set Point-No Diet group ate significantly less ($p<.016$) than both the Normal Weight at Set Point and the Normal Weight Below Set Point-Diet group.

There was also a significant Set Point Classification X Clock Speed Interaction. This interaction is presented graphically in Figure 3. In order to determine which means were significantly different, Newman-Kuels post hoc comparisons were done. The results appear in Table 28. These results partially support Hypothesis b of Section 3.4. The Normal Weight at Set Point and Normal Weight Below Set Point-Diet Groups ate significantly ($p<.05$) more when they thought it was at dinner than when they thought it was before dinner time. The results also indicate that the Normal Below Set Point-No

Table 26

Mean Amount Eaten by the Control Groups and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm at Set Pt.	184.43gr.(5153.29)	115.00gr.(5816.67)	$\overline{X}$=149.71gr.
Norm Below Set Pt. Diet	187.14gr.(3732.14)	115.57gr.(4179.62)	$\overline{X}$=151.36gr.
Norm Below Set Pt. No Diet	52.71gr.(2411.79)	87.43gr.(2366.28)	$\overline{X}$= 70.07gr.

Fast Clock = 141.43 gr.   Slow Clock = 106.00 gr.

Table 27

Analysis of Variance for Amount Eaten - Control Groups

SV	df	MS	F
Set Point Classification	2	30223.79	7.66(p<.005)
Clock Speed	1	13179.43	3.34
Set Point Classification X Clock Speed	2	12919.07	3.28(p<.05)
Error	36	3943.37	

Nonorthogonal Planned Comparisons between the Set Point Classification Means

F Values for Differences Among Means:

	At Set Point	Below Set Point-Diet
Below Set Point No Diet	11.26*	11.73*
At Set Point		.004

*p<.03

EW = .05 K = 3 (number of contrasts)

$\frac{EW}{K}$ = .016 (significance level/contrast)

Critical F (.016, 1 and 36 df) = c. 7.31

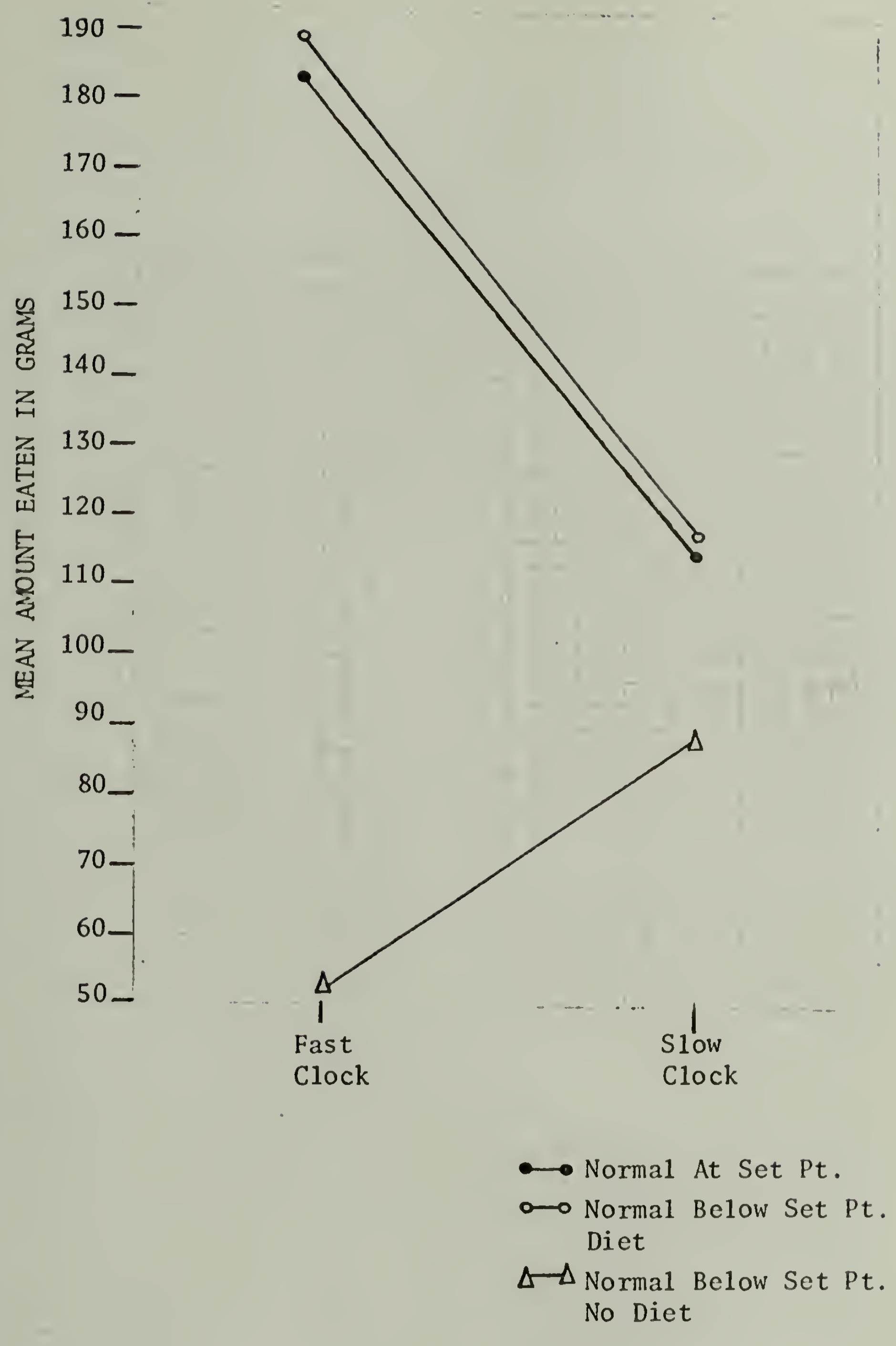

Fig. 3 - SIGNIFICANT SET POINT CLASSIFICATION X CLOCK SPEED INTERACTION

Table 28

Contrasts Among the Means of the Set Point Classification X Clock Speed Interaction (Control Groups)

$\overline{X}_{A_3B_1}$ = 52.71429 $\overline{X}_{A_3B_2}$ = 87.42857 $\overline{X}_{A_1B_2}$ = 115.0000

$\overline{X}_{A_2B_2}$ = 115.57143 $\overline{X}_{A_1B_1}$ = 184.42857 $\overline{X}_{A_2B_1}$ = 187.14286

Differences Among the Means:

	$\overline{X}_{A_3B_2}$	$\overline{X}_{A_1B_2}$	$\overline{X}_{A_2B_2}$	$\overline{X}_{A_1B_1}$	$\overline{X}_{A_2B_1}$
$\overline{X}_{A_3B_1}$	34.71428	62.28571*	62.85714*	131.71428*	134.42857*
$\overline{X}_{A_3B_2}$		27.57143	28.14286	97.0000*	99.71429*
$\overline{X}_{A_1B_2}$			.57143	69.42857*	72.14286*
$\overline{X}_{A_2B_2}$				68.85714*	71.57143*
$\overline{X}_{A_1B_1}$					2.71429

* $p<.05$

Newman-Kuels critical values:

Means 6 ordered steps apart = 70.9794
Means 5 ordered steps apart = 67.7912
Means 4 ordered steps apart = 63.5962
Means 3 ordered steps apart = 57.7232
Means 2 ordered steps apart = 47.9908

A_1 = At Set Point
A_2 = Below Set Point-Diet
A_3 = Below Set Point-No Diet

B_1 = Fast Clock
B_2 = Slow Clock

Diet group in the Fast Clock condition ate significantly ($p<.05$) less than all other groups except their Slow Clock counterparts. This of course indicates that the Clock Speed had no effect on the amount eaten by the Normal Below Set Point-No Diet group. Further the Normal Below Set Point-No Diet Slow Clock group ate significantly less ($p<.05$) than the other 2 Normal Weight Fast Clock Groups (but not significantly less than the other 2 Normal Weight Slow Clock groups). There was also a significant difference ($p<.05$) between the Normal At Set Point-Fast Clock group and the Normal Below Set Point-Diet Slow Clock group; similarly there was a significant difference between the amount eaten by the Normal At Set Point Slow Clock group and the Normal Below Set Point-Diet Fast Clock group. This is to be expected because of the similarity of the means and the already noted significant difference between the Fast Clock and Slow Clock conditions for both of these Normal Weight groups.

In order to investigate the interaction further, contrasts between the mean amounts eaten in the Fast and Slow Clock conditions were compared for the various Set Point Classification groups. The results indicate that the interaction arose out of the decrease in amount eaten between the Fast Clock and Slow Clock conditions for the Normal At Set Point and Normal Below Set Point-Diet groups as compared to the increase for the Normal Below Set Point-No Diet group ($F=9.63$ and 10.03; 2 and 36 df) after adjusting the error rate EW using the Scheffe' test (criterion $F=8.10$; 2 and 36 df).

(3.4-2) Summary of Amount Eaten Data

Hypothesis a of Section 3.4 was unsupported. In fact, the Normal Weight Below Set Point-No Diet group ate significantly less than both the Normal Weight at Set Point and the Normal Weight Below Set Point-Diet Group.

Hypothesis b was supported only in part. Only the Normal Weight At Set Point Group and the Normal Weight Below Set Point-Diet group ate significantly more when they thought it was after dinner than when they thought it was before dinner.

Hypothesis c was unsupported.

The other results included:

The Normal Below Set Point-No Diet group in the Fast Clock condition ate significantly less than all other groups except their Slow Clock counterparts. Further, the Normal Below Set Point-No Diet Slow Clock group ate significantly less than the other 2 Normal Weight Fast Clock groups. There was also a significant difference between the amount eaten by the Normal At Set Point Slow Clock group and the Normal Below Set Point-Diet Fast Clock group; similarly there was a significant difference between the amount eaten by the Normal At Set Point Fast Clock group and the Normal Below Set Point-Diet Slow Clock group. Finally the significant interaction effect arose out of the decrease in amount eaten between the Fast Clock and Slow Clock conditions for the Normal At Set Point and Normal Below Set Point-Diet groups as compared to the increase for the Normal Below Set Point-No Diet group.

(3.4-3) Hunger, Taste, Color, Sweetness Ratings

These ratings will be presented together. No significant differences were found among any of the groups with regard to any of these ratings. Therefore they will not be discussed in detail. The means, variances, and ANOVAs are presented in Tables 29 through 32.

The overall Hunger Rating was between "A little" and "moderately". The overall mean Taste Rating was between "Not Very Good" and "Fairly Good". The overall mean Color Rating fell between "A little weak" and "Just about right". The overall mean Sweetness Rating was very close to "A little Sweet".

(3.4-4) Correlations Between Amount Eaten and Hunger, Taste, Color, or Sweetness Ratings

These correlations are presented together in Table 33 to 36. Two correlations were found to be significant. The first correlation indicated a significant positive relation ($p<.05$) between Hunger Rating and the amount eaten by the Normal Weight Below Set Point-Diet Slow Clock group. The second significant correlation ($p<.05$) indicated that, for the Normal Weight Below Set Point-No Diet Slow Clock group, the higher their Taste Rating, the more they ate.

(3.4-5) Correlations Between Amount Eaten in the Control Groups and their Income and Actual Weight

The correlation coefficients for the relationship between the amount eaten and the subjects' income, as described in Section 2.1-3 appear in Table 37. No significant correlations were found.

Table 29

Mean Hunger Ratings and their Variances for Each Control Group
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.29(1.24)	2.71(1.24)	$\bar{X}$ = 3.00
Norm Below Set Pt. Diet	2.86(1.14)	3.14 (.81)	$\bar{X}$ = 3.00
Norm Below Set Pt. No Diet	2.29 (.57)	2.86(1.14)	$\bar{X}$ = 2.57
	$\bar{X}$ = 2.81	$\bar{X}$ = 2.90	

Hartley's test = 2.17 (n.s.) (a=6, df=6)

Analysis of Variance for Control Hunger Ratings

Source	df	MS	F
Set Point Classification	2	1.71	<1
Clock Speed	1	.10	<1
Set Point Classification X Clock Speed	2	2.48	<1
Error	36	36.86	

Table 30

Mean Taste Ratings and their Variances for Each Control Group
(Variances appear in parentheses)

	Fast Clock	Slow Clock
Norm At Set Point	2.90(1.69)	3.81(.11)
Norm Below Set Pt. Diet	3.76 (.17)	3.76(.66)
Norm Below Set Pt. No Diet	3.43(1.51)	3.33(.59)

Hartley's test = 15.36 ($p<.05$) ($a=6$, $df=6$)

Analysis of Variance for Taste Ratings of Control Groups

Source	df	MS	F
Set Point Classification	2	.72	<1
Clock Speed	1	.77	<1
Set Point Classification X Clock Speed	2	1.06	1.35
Error	36	.79	

Table 31

Mean Color Ratings and their Variances for Each Control Group
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	2.86(.14)	2.90(.03)	$\overline{X}$ = 2.88
Norm Below Set Pt. Diet	2.57(.29)	2.95(.20)	$\overline{X}$ = 2.76
Norm Below Set Pt. No Diet	2.81(.11)	2.71(.16)	$\overline{X}$ = 2.76
	$\overline{X}$ = 2.74	$\overline{X}$ = 2.86	

Hartley's test = 10.38 (a=6, df=6)

Analysis of Variance for Color Ratings of Control Groups

Source	df	MS	F
Set Point Classification	2	.07	<1
Clock Speed	1	.13	<1
Set Point Classification X Clock Speed	2	.21	1.34
Error	36	.15	

Table 32

Mean Sweetness Ratings and their Variances for Each Control Group
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	2.05(1.60)	1.90(.29)	$\bar{X}$ = 1.97
Norm Below Set Pt. Diet	2.19 (.59)	1.95(.46)	$\bar{X}$ = 2.07
Norm Below Set Pt. No Diet	1.95 (.38)	1.71(.57)	$\bar{X}$ = 1.83
	$\bar{X}$ = 2.06	$\bar{X}$ = 1.85	

Hartley's test = 58.37 ($p<.01$) (a=6, df=6)

Analysis of Variance for Sweetness Ratings of Control Groups

Source	df	MS	F
Set Point Classification	2	.20	<1
Clock Speed	1	.45	<1
Set Point Classification X Clock Speed	2	.0098	<1
Error	36	.65	

Table 33

Correlations between Control Groups' Hunger Ratings and Amount Eaten
(Mean amount eaten appears in parentheses)

	Fast Clock	Slow Clock
Norm At Set Point	r = -.60(184.43)	r = -.11(115.00)
Norm Below Set Pt. Diet	r = .36(187.14)	r = .81(115.57)*
Norm Below Set Pt. No Diet	r = .08 (52.71)	r = .43 (87.43)

Overall r = .21

* p<.05

Table 34

Correlations between Control Groups' Taste Ratings and Amount Eaten
(Mean amount eaten appears in parentheses)

	Fast Clock	Slow Clock
Norm At Set Point	r = .35(184.43	r = .32(115.00)
Norm Below Set Pt. Diet	r = .22(187.14)	r = .19(115.57)
Norm Below Set Pt. No Diet	r = -.10 (52.71)	r = +.78 (87.43)*

Overall r = -.02

* p<.05

Table 35

Correlations between Control Groups' Color Ratings and Amount Eaten
(Mean amount eaten appears in parentheses)

	Fast Clock	Slow Clock
Norm At Set Point	r = .26(184.43)	r = .18(115.00)
Norm Below Set Pt. Diet	r = -.53(187.14)	r = .40(115.57)
Norm Below Set Pt. No Diet	r = .55 (52.71)	r = .16 (87.43)
		Overall r = .02

Table 36

Correlations between Control Groups' Sweetness Ratings and Amount Eaten
(Mean amount eaten appears in parentheses)

	Fast Clock	Slow Clock
Norm At Set Point	r = .14(184.43)	r = .28(115.00)
Norm Below Set Pt. Diet	r = .53(187.14)	r = .13(115.57)
Norm Below Set Pt. No Diet	r = -.10 (52.71)	r = -.47 (87.43)
		Overall r = .20

Table 37

Correlations between Control Groups' Incomes and Amount Eaten
(Mean amount eaten appears in parentheses)

	Fast Clock	Slow Clock
Norm At Set Point	r = .57(184.43)	r = -.49(115.00)
Norm Below Set Pt. Diet	r = .32(187.14)	r = .16(115.57)
Norm Below Set Pt. No Diet	r = -.14 (52.71)	r = -.46 (87.43)

Overall r = .12

Table 38

Correlations between Control Groups' Actual Weight and Amount Eaten
(Mean amount eaten appears in parentheses)

	Fast Clock	Slow Clock
Norm At Set Point	r = .38(184.43)	r = .32(115.00)
Norm Below Set Pt. Diet	r = -.43(187.14)	r = -.12(115.57)
Norm Below Set Pt. No Diet	r = .70 (52.71)	r = .26 (87.43)

Overall r = .27

To determine if there was a significant relationship between amount eaten and the Ss' actual weight, correlations were again performed. The results are summarized in Table 38. No significant correlations were found. However, the overall relation between the Ss' actual weight and the amount eaten approached significance ($r=.27$; $p<.10$).

(3.4-6) Summary of Correlation Data

Two correlations were found to be significant. Another approached significance. As noted in Section 3.2-8, the large number of correlations (42) performed make it likely that these significant results are attributable to chance. Thus they will not be dealt with as theoretically significant.

(3.5) Correlation between the Ss' Age and Amount Eaten

Because there was a significant age effect (see Section 2.1-1), Pearson product moment correlations were performed to determine if there was a significant relationship between the Ss' age and the amount eaten. The overall correlation ($r=-.05$; 82 df) for the Main part of the study was nonsignificant. The overall correlation for the Control groups was also not significant ($r=.14$; 40 df). Because of this, it was not deemed necessary to use age as a covariate for the amount eaten data.

(3.6) Weight Discrepancy for Control Groups

In order to assess the accuracy of the Ss' weight reporting, the Control Ss' actual measured weight was subtracted from her reported

weight. The mean differences appear in Table 38. Hartley's test revealed a significant heterogeneity of variance (23.34; a=6; 6 df; $p<.05$). A summary of an ANOVA of the Control Groups' weight discrepancy appears in Table 39. A significant ($p<.05$) Clock Speed effect was found. The Ss in the Fast Clock condition underreported their weight to a significantly ($p<.05$) greater degree than did Ss in the Slow Clock condition. This finding is quite puzzling. The Ss filled in their weight information shortly after the experimental procedure was begun. Thus, the clock manipulation had barely begun. One explanation for this effect would be nonrandom S assignment into the 2 Clock Speed conditions but this explanation is unappealing because it does not reflect the actual method of S assignment. It is possible, however, that this finding is unreliable, arising out of the heterogeneity of variance among the groups.

(3.7) Response to the "Clean your plate" Question

This question appeared on the Background Information sheet (see Appendix 1). Nisbett (1968a) hypothesized that Obese Ss will clean their plates entirely until all food cues are gone because their eating behavior is supported by those cues. This would not be true for Normal Weight Ss. The responses to this question were in the predicted direction, according to Nisbett's data. The responses to the "clean your plate" question in this study are summarized in Table 40. These findings do not support Nisbett's hypothesis. Most Ss of all weight categories describe themselves as nearly always cleaning their plates.

Table 39

Mean Control Discrepancies and their Variances
(Negative values indicate that the Ss underreported their weights; variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	-3.86(19.81)	-1.00 (2.00)	$\overline{X}$ = -2.43
Norm Below Set Pt. Diet	-1.43(28.29)	-1.00 (2.90)	$\overline{X}$ = -1.22
Norm Below Set Pt. No Diet	-2.71 (3.57)	1.14(46.48)	$\overline{X}$ = -.79
	$\overline{X}$ = -2.67	$\overline{X}$ = -.29	

Analysis of Variance for Weight Discrepancy (Control)

Source	df	MS	F
Weight Group	2	10.79	<1
Clock Speed	1	64.38	3.75($p<.05$)
Weight Group X Clock Speed	2	9.02	<1
Error	36	17.17	

Table 40

Responses to the "Clean Your Plate" Question

GROUP	Nearly Always Clean Plate (%)	Sometimes Clean, Sometimes Leave (%)	Nearly Always Leave (%)
High At Fast	1.00		
High At Slow	.71	.29	
High Below Fast	.71	.29	
High Below Slow	.71	.29	
Mod At Fast	.43	.57	
Mod At Slow	.57	.43	
Mod Below Fast	.57	.43	
Mod Below Slow	.29	.57	.14
Norm At Fast	.71	.29	
Norm At Slow	.86	.14	
Norm Below Fast	.57	.43	
Norm Below Slow	.86	.14	
Control Fast	.29	.71	
Control Slow	.57	.29	.14

(3.8) Semantic Differential Data

The Semantic Differential data is analyzed in detail in Appendix 2. The results will only be summarized here.

DIET

1. Below Set Point-Diet Ss rated DIET as significantly ($p<.05$) more powerful than the At Set Point Ss. The At Set Point Ss rated DIET between neutral and slightly impotent (4.58). The Below Set Point-Diet Ss rated DIET between slightly potent and neutral (3.88).

DESSERT

2. High Obesity Ss rated DESSERT significantly ($p<.05$) less positively than did either the Moderately Obese Ss or Normal Weight Ss. The High Obesity Ss rated DESSERT between quite and slightly positive (2.90). The Moderately Obese Ss rated DESSERT as quite positive (2.04) and the Normal Weight Ss rated DESSERT as quite positive also (2.11).
3. The High Obese Ss in the Slow Clock condition rated DESSERT significantly ($p<.05$) more negatively than any of the other groups. The High Obese Ss rated DESSERT between slightly positive and neutral (3.5). The other groups rated DESSERT as quite positive (around 2.0).
4. A significant ($p<.05$) Degree of Overweight X Clock Speed interaction for the Evaluative ratings of DESSERT was found. This interaction arose from the significant change in the simple effect of the clock manipulation for the High Obesity and Normal Weight

Ss. That is, there was a change from a neutral evaluation of DESSERT by the High Obese Fast Clock Ss to a more negative evaluation by the High Obese Slow Clock Ss, in contrast to the opposite effects for the Normal Weight Ss (although the change was not as marked, but the difference was statistically significant).

5. Ss in the Fast Clock condition rated DESSERT as significantly ($p<.05$) more active than the Ss in the Slow Clock condition. Both ratings fell between neutral and slightly passive (4.15 and 4.50).

CALORIES

6. Ss At Set Point rated CALORIES significantly ($p<.025$) more positively than Ss Below Set Point-Diet. The At Set Point Ss rated CALORIES between neutral and slightly negative (4.54). The Below Set Ss rated CALORIES between slightly negative and quite negative (5.33).

7. A significant ($p<.005$) Degree of Overweight X Clock Speed interaction was found. None of the means in this interaction were significantly different but the interaction effect was due to a decrease in mean potency ıatings for CALORIES between the Fast Clock to Slow Clock conditions for the Moderately Obese Ss as compared to an increase for the High Obese and Normal Weight Ss. The overall potency rating for all groups was between slightly potent and neutral (3.75).

8. A significant ($p<.005$) Degree of Overweight X Clock Speed interaction was found. The At Set Point Ss in the Fast Clock condition rated CALORIES as significantly less potent ($p<.005$) than

did the At Set Point Ss in the Slow Clock condition or the Below Set Point-Diet Ss in the Fast Clock condition. The significant interaction effect was attributable to the decrease in potency rating of the Below Set Point-Diet Ss between the Fast Clock and Slow Clock conditions as compared to the increase for the At Set Point Ss. The Fast Clock condition led to significantly different CALORIE potency ratings for the At Set Point and Below Set Point-Diet Ss with the Slow Clock condition leading to approximately the same ratings for the 2 groups.

ME, AS I AM

9. Ss in the Slow Clock condition rated their private selves more positively ($p<.01$) than Ss in the Fast Clock condition. The Fast Clock Ss rated their private selves between slightly positive and neutral (3.29). The Slow Clock Ss rated their private selves between quite positive and slightly positive (2.64).

10. The Ss in the Fast Clock condition rated their private selves as significantly more potent ($p<.05$) than Ss in the Slow Clock condition. Both ratings fell between slightly potent and neutral (3.08 and 3.45).

11. The High Obesity Ss rated themselves as significantly more potent ($p<.05$) than did either the Moderately Obese or Normal Weight Ss. The High Obese Ss rated their private selves between quite and slightly potent (2.71). The Moderately Obese rated their private selves between slightly potent and neutral (3.22) as did the Normal Weight Ss (3.87).

ME, AS I WOULD LIKE TO BE

12. The Ss in the Slow Clock condition rated their ideal selves as significantly ($p<.05$) more positive than did their Fast Clock counterparts. The Fast Clock Ss rated their ideal selves between quite positive and slightly positive (1.65), as did the Slow Clock Ss (1.40).

13. High Obesity Ss rated their ideal selves significantly ($p<.05$) more positively than did the Normal Weight Ss, but not significantly more than the Moderately Obese. All groups rated their ideal selves between very positive and quite positive (1.28, 1.57, 1.73).

14. A significant ($p<.05$) Weight X Set Point Classification X Clock speed interaction was found. The interaction was due primarily to the large decrease between the Fast Clock and Slow Clock conditions in the Activity Rating of ME, AS I WOULD LIKE TO BE for the Moderately Obese Below Set Point-Diet and the High Obese At Set Point groups as compared to the slight increase for the other groups.

ME, AS OTHERS SEE ME

15. The High Obese and Moderately Obese Ss rated their public selves as significantly ($p<.05$) more potent than did the Normal Weight Ss. The mean potency rating by the High Obese Ss was between quite potent and slightly potent (2.74). The mean rating by the Moderately Obese Ss was slightly potent (3.02). The Normal Weight Ss' mean potency rating was between neutral and slightly impotent (4.32).

CONTROL GROUPS:

OBESITY

16. The Normal Weight Below Set Point-Diet Ss rated OBESITY as significantly ($p<.05$) more active than either the Normal Weight At Set Point and Normal Weight Below Set Point-No Diet Ss. The mean rating by the Moderately Obese was between neutral and slightly passive (4.35). The mean ratings for the Normal At Set Point and Normal Below Set Point-No Diet groups were between slightly passive and quite passive (5.24 and 5.43).

CALORIES

17. The Normal Weight Below Set Point-No Diet group rated CALORIES significantly ($p<.05$) less positively than did the Normal Weight At Set Point and Normal Weight Below Set Point-Diet group. The mean rating by the Normal Weight Below Set Point-No Diet group was between slightly negative and quite negative (5.30). The other two groups had mean ratings between neutral and slightly negative (4.09 and 4.84).

18. Fast Clock Ss rated CALORIES as significantly ($p<.025$) less potent than the Ss in the Slow Clock condition. The At Set Point Ss had a mean rating between neutral and slightly impotent (4.18). The Fast Clock Ss had a mean rating between slightly potent and neutral (3.22).

(4.0) Discussion

(4.1) Review of Hypotheses and Findings

The main part of this study investigated two basic phenomena related to the environmental control of eating. The first phenomenon concerned the effect on amount eaten of a subject being At- or Below Set Point, as defined by being not on a diet or by being on a diet with an accompanying weight loss. The second phenomenon investigated was the effect of apparent time on amount eaten. The predictions made in this study were based on revisions of Schachter's original statement of the external hypothesis; that is, that responsiveness to external cues is a direct function of weight. This revision (based on Nisbett's 1972 hypotheses) predicts that responsiveness to external cues is a direct function of being at or below the organism's biologically programmed "set point" for weight. The external cue selected to investigate this revision involved the apparent time of day. This time manipulation technique was originally developed by Schachter and Gross (1968). For half of the Ss, one clock was run at twice its normal rate for one-half of the hour long experimental session. For the other half of the Ss, another clock was run at half its normal rate. Because each Ss was scheduled one hour before her usual time of eating, the net result was that: half of the Ss were apparently tasting low calorie desserts during their usual time of eating; the other half of the Ss were apparently tasting the desserts forty-five minutes before their usual time of eating. The dependent variable was the amount of low calorie dessert eaten. There were

three weight groups. The first was a Normal Weight group, the second was a Moderately Obese group and the third was a High Obese group, as defined by insurance height and weight norms. Within each of these weight groups there were two smaller groups of Ss. The first subgroup was made up of At Set Point Ss as defined by their not having lost weight recently. The second subgroup was made up of Ss Below Set Point as defined by their having recently lost weight. All Ss believed that they were involved in "taste testing" a new, low calorie dessert. All Ss were female.

The results of the present study did not support the Nisbett revision of the external hypothesis. That is, Ss Below Set Point did not eat significantly more than Ss At Set Point. Ss Below Set Point did not eat significantly more than Ss At Set Point when they thought it was before dinner time, nor did Ss Below Set Point eat significantly less than Ss At Set Point when they thought it was after dinner time. Finally, the eating behavior of Ss Below Set Point was not influenced by the external time cue significantly more than the behavior of the Ss At Set Point.

The obtained results, however, lead in a different direction. The actual findings were:

1. When the Moderately Obese Ss perceived it to be before their usual dinner time, they ate significantly more than when they perceived it to be during their usual dinner time. In contrast, when the Normal Weight Ss perceived it to be before their usual eating time, they ate significantly less than when they perceived it to be during their

usual time of eating.

2. The Moderately Obese Ss ate significantly less in the Fast Clock condition than did either the High Obese or Normal Weight Ss. Even though the Moderately Obese ate less in the Fast Clock condition than any other group, they did not eat significantly less than the smallest amount eaten by the Normal Weight Ss.

3. The Normal Weight Ss in the Fast Clock condition ate significantly more than the High Obese Ss in the Slow Clock condition.

4. The clock manipulation had no significant effect on the amount eaten by the High Obese Ss.

5. The significant interaction effect was due primarily to the increase in amount eaten between the Fast Clock to Slow Clock conditions for the Moderately Obese Ss as compared to the decrease for the High Obese and Normal Weight Ss.

(4.2) Discussion of Findings

(4.2-1) Degree of Overweight

These findings suggest that there are two distinct groups of overweight female Ss in terms of their response to the external cue of time. The first is a Moderately Obese group whose eating patterns show a differential sensitivity to time; the second is a High Obese group whose eating patterns do not show differential sensitivity to the external cue of time. These two groups are separate and distinct from Normal Weight Ss whose eating patterns show significant

differential sensitivity to the time cue, but in a direction opposite to that of the Moderately Obese group. These findings support the suggestion of Johnson (1970, p. 30) that there might be 2 distinct groups of overweight Ss with regard to sensitivity to external cues.

On the basis of these results, it appears that if there is to be an accurate summary statement of the external hypothesis, it must include some recognition of the fact that obese females are not a monolithic or homogeneous group with regard to their sensitivity to external cues.

(4.2-2) External Control of Eating Behavior

The eating behavior of both the Moderately Obese and the Normal Weight group was significantly controlled by the external cue of time. Both groups were "stimulus bound" but in the opposite direction from each other. The external time cue had a significant impact on the eating behavior of Normal Weight females such that when the clock indicated it was before their usual time of eating, they were less inclined to eat than when the clock indicated it was during their usual time of eating (given equal food deprivation). The eating patterns of the Moderately Obese Ss were opposite to those shown by the Normal Weight Ss. When the clock indicated it was before dinner they were more inclined to eat than when the clock indicated it was during their usual time of eating. Even though the Moderately Obese in the Fast Clock condition ate less than all other groups, this was not an unusually low food intake because it was not significantly less than the smallest amount eaten by the Normal Weight Ss

(in the Slow Clock condition). Similarly, even though the Normal Weight Ss in the Fast Clock condition ate more than all other groups, this was not an unusually large food intake because it was not significantly different than the second largest amount eaten (by the Moderately Obese in the Slow Clock condition). In fact, it appears that the eating pattern of the Moderately Obese is best described as a mirror image of the eating pattern of the Normal Weight Ss. This helps to explain why the Moderately Obese and Normal Weight Ss did not eat significantly different amounts overall in this study (or in most other obesity studies). Given only two eating opportunities, the "mirror image" effect would tend to cancel out any differences in overall amount eaten between the two groups.

The thesis of this discussion is that the difference between the eating patterns of the Moderately Obese and the Normal Weight Ss may reflect both the high probability that the Moderately Obese, and the low probability that the Normal Weight Ss, will eat at times other than the usual breakfast, lunch, or supper periods. Given this, if more eating periods would have been offered in the present study, the greater amount of food eaten by the Moderately Obese to maintain their weight vis-à-vis Normals would begin to be apparent. If the total time taken up by the three usual eating periods is three hours (i.e., breakfast, lunch, and dinner), some nine other hours in a normal 12 hour day are available for eating. If 12 eating periods one time an hour from 8 A.M. to 8 P.M. were offered in the present study, on the basis of the obtained data the Normal Ss would be expected to

eat approximately 1595 grams [3(185.79 grams) + 9(115.29 grams)].[3] The Moderately Obese would be expected to eat approximately 1690.68 grams [3(85.93 grams) + 9(159.21 grams)].[4] By the end of one day, the Moderately Obese would have ingested some 96 grams more gelatin than the Normal Weight Ss. If regular food, rather than diet food, had been offered, it could result in massive differences in caloric intake. The differences in caloric intake could probably be made to be even greater if the food were better tasting than the low calorie gelatin used here. Nisbett (1968a; 1968b) found a significant relationship between weight deviation, amount eaten and taste quality--the heavier the S, the more good tasting food he eats. The mean taste ratings in this study fell between "Not very good" and "Fairly good". If food of "Excellent" taste had been used, the amount eaten curve of the Moderately Obese (Figure 2) would probably have been much more elevated than the amount eaten curve of the Normal Weight Ss, to whom taste is less important in determining amount eaten. This would of course elevate the overall amount eaten by the Moderately Obese. One further factor is also important. Obese Ss, as described by Stunkard and Koch (1964), do not accurately know when they are hungry or when they are sated. During a 12 hour period, satia-

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[3]185.79 grams = Mean amount eaten by Normal Weight Ss at their "apparent" dinner time (Fast Clock condition). 115.29 grams = Mean amount eaten by Normal Weight Ss before their dinner time (Slow Clock condition). See Table 15.

[4]85.93 grams = Mean amount eaten by Moderately Obese Ss at their "apparent" dinner time (Fast Clock condition). 159.21 grams = Mean amount eaten by Normal Weight Ss before their dinner time (Slow Clock condition). See Table 15.

tion effects would interfere less with the eating of the Moderately Obese than it would the eating of Normals. This would further tend to increase the food intake of the Moderately Obese in comparison to the Normal Weights.

Thus it appears that Moderately Obese females can control their food intake during regular times of eating and they may even appear to eat less than normals at mealtime. They apparently do not retain that control, however, during other hours of the day. This has important, yet almost obvious treatment implications for Moderately Obese females. Treatment should be aimed at teaching them to limit their eating to the three basic mealtimes. Eight A.M., 12 Noon, and 6 P.M. must become strong positive cues for eating, and the other hours of the day must become very weak cues for eating. This may even be able to overcome the effects of the taste sensitivity of the Moderately Obese, regardless of its origin. Such a treatment program was advocated by Ferster, et. al. (1962) some eleven years ago.

The eating patterns of the High Obese Ss in this study show no statistically significant differential sensitivity to the time cue (although there was a nonsignificant trend toward a pattern similar to the Normal eating pattern). The High Obese eating pattern (just as that of the Moderately Obese) did not result in the High Obese Ss eating significantly more than the Normal Weight Ss. The "triggering mechanism" for their increased food intake, however, may well be a function of this lack of differential sensitivity to external cues. It can be hypothesized on the basis of this data that High Obese female Ss respond to a very wide range of stimuli with an eating re-

sponse. Using the 12 eating period paradigm, the High Obese Ss would be expected to eat 1583.37 grams [3(153 grams) + 9(124.93 grams)].[5] While this is less than the amount eaten in grams by the other 2 groups, the effect of taste is probably even more important here than for the Moderately Obese. Decke's findings (cited in Schachter, 1971) suggest that given food of bad taste, the more an S weighs, the less he will eat. Thus, the rather mediocre taste of the desserts in the present study may have considerably suppressed the overall amount eaten by the High Obese Ss.

In sum, the results of this study suggest that there are three different mechanisms for controlling amount eaten in the three weight groups. These differences were reflected in eating patterns which suggest that the probability of eating in response to inappropriate cues is a function of weight--the more Ss' weigh, the more likely they are to respond to inappropriate cues with eating. These results and the results of other studies suggest that increased caloric intake can come about both as a function of faulty stimulus control and as a function of the taste quality of what is eaten. The significant control exerted by the external cue of time on the eating patterns of the Normal Weight group is quite different from the findings reported by Schachter and his co-workers, who found that normal weight Ss were controlled primarily by internal cues of hunger rather than external cues. These findings were interpreted by Schachter as indicating

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[5] 153 grams = Mean amount eaten by High Obese Ss at their "apparent" dinner time (Fast Clock condition). 124.93 grams = Mean amount eaten by High Obese Ss before their dinner time (Slow Clock condition). See Table 15.

that the eating of normals is controlled by internal hunger cues (the Internal Hypothesis) and that the eating of obese Ss is controlled by external cues (the External Hypothesis). The findings of this study show that Ss can still be controlled by external cues yet remain of normal weight. The critical factor seems more to be what controls the amount eaten in response to the external cues (e.g., temporal discrimination or food cues) rather than just the mere fact of responding to those cues.

Until further research is conducted in these areas, it is not possible to know if these mechanisms (i.e., eating in response to inappropriate cues) is the cause of obesity or the result.[6] The present data are consistent with either interpretation.

(4.2-3) Comparison with Schachter and Gross (1968)

In the study by Schachter and Gross (1968) their obese Ss had a mean percent deviation from the norm of +31.5. This is far less than the +50.6 percent weight deviation for all obese Ss used in the present study. It is much smaller than the 75.8% weight deviation for the High Obese Ss in this study but it compares favorably with the 25.5% weight deviation for the Moderately Obese Ss in this study. In fact, it may be that Schachter and Gross' obese group was really equivalent to the Moderately Obese group of the present study. Assuming this to be the case, and for the moment ignoring the High

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[6]For example, if a person is "biologically programmed" to be obese, he would eat out of necessity in many inappropriate situations simply to meet the high demands for food of the biological program.

Obese group in the present study, the Degree of Overweight X Clock Speed interaction found by Schachter and Gross in their initial analysis of their data. That is, they found that obese Ss in the Fast Clock condition ate more than obese Ss in the Slow Clock condition. In contrast their normal Ss ate more in the Slow Clock than in the Fast Clock condition.

Several factors may account for these divergent findings. The first is the kind of food that was offered in the two studies. Schachter and Gross (1968) offered their Ss crackers to eat. The present study used a low calorie gelatin dessert in order that the diets of the Below Set Point Ss would not be violated. The Ss' attitudes toward a "low calorie dessert" may be quite different than the same Ss attitude toward "crackers"; these differences may be reflected in how much the subject eats of each. It can be hypothesized that Normals may perceive crackers as potentially spoiling their meal if they eat them close to their dinner time (in the Fast Clock condition). The data of Schachter and Gross (1968) would support this notion. In contrast a low calorie gelatin dessert may be seen as posing less a threat to the meal because of its low calorie nature and its rather bulkless physical properties. The data of the present study can be seen as supporting this notion in that no Normal Weight Ss reported that they thought the gelatin would spoil their supper. Likewise, the Obese may perceive crackers as not threatening their meal and as being something good to eat, even when it is close to their mealtime. Again, Schachter and Gross (1968) found that no Obese Ss reported being concerned that the crackers would spoil their

meal. In contrast, eating a lot of a gelatin dessert (low calorie or not) close to dinner time may cause too much guilt. Given this, the Obese Ss were not concerned that the gelatin would spoil their meal, rather they were concerned about the guilt that eating it would engender. Unfortunately, the present data are not extensive enough to know if this hypothesis is reasonable.

In the present study the Moderately Obese and Normal Weight Ss ate statistically the same in the Slow Clock condition. It is possible that their divergent attitudes toward the two different kinds of food only become apparent in the Fast Clock condition. This would not explain, however, the significant differences in amount eaten between the two groups in the Slow Clock condition of the Schachter and Gross (1968) study.

The second factor which may account for the differences between the Schachter and Gross (1968) and the present study is procedural. Schachter and Gross explained the Normal Fast Clock effect by noting that "several" (the "n" was otherwise unspecified) Ss in this group indicated that they refrained from eating in order not to spoil their supper. One S who similarly indicated that she refrained from eating in the present study was eliminated from the data analysis. Had the Ss who similarly protested been eliminated in the study of Schachter and Gross it is possible that their results would have more closely resembled the results of the present study, at least with regard to Normal Weight Ss. Further, because these authors did not present separately the data from these Ss it is not possible to assess the validity of their interpretation or the degree to which it affected

the overall mean amount eaten data. It would also be interesting to know why "several" refrained from eating in the study of Schachter and Gross while only one did so in this study, where a brief interview was used to determine if such a phenomenon was occurring.

A third major difference between the study of Schachter and Gross and the present study is the former used all male Ss while the latter used all female Ss. Apparent gender-related differences have been found in several studies in the obesity literature. Stunkard (1959) reported that he found treatment for obesity to be considerably more successful for men than for women. Harris (1969) reported a similar finding. Stunkard and Koch (1964) found that gender plays an important part in the relationship between gastric motility and hunger reports. They found that obese women "deny hunger" as shown by infrequent reports of hunger in the presence of gastric motility, while obese men "exaggerate hunger" as shown by reporting hunger very often in the absence of stomach contraction. Most recently, Rudman (1973) reported, in a study using both males and females, that the eating behavior of obese females was opposite to that of males. That is, he found that obese females decreased their food consumption with increasing cue prominence, while obese males performed just the opposite. As Rudman notes (1973, p. 96):

> (Schachter's) position was extrapolated from data derived only from male subjects and recent studies (Schwabacher, 1973; Presscott 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 psychological theories of human nature.

One other investigation tends to support further the notion that women may function differently than men with regard to the External Hypothesis. Nisbett and Kanouse (1969) in a naturalistic observation study in a supermarket, found that normals buy more food if recently deprived than if recently sated. They also found that normals buy slower than obese Ss if recently deprived, but faster if recently sated. They found that obese Ss buy more food if they have recently eaten than if they are sated. The authors were hard pressed to account for this finding. While no particular note was made of the fact, 81% of the Ss in this study were female. It might well be then their unusual findings were related to the large percentage of female Ss that were used and further it might well be that their findings are more understandable in light of the findings from the present study. In the Slow Clock condition the Moderately Obese Ss[7] have eaten more recently according to the gimmicked clock than have the Moderately Obese Ss in the Fast Clock condition. In terms of apparent time, the Slow Clock Ss are less deprived than the Fast Clock Ss, assuming the same time since the last meal for both groups. Under these circumstances the Moderately Obese Ss ate more food if they were apparently less deprived than if they were apparently more deprived. A similar but opposite interpretation could be made from the Normal Weight data of the present study to explain the behavior of the Normal Weight Ss in the Nisbett and Kanouse (1969) study.

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[7]This assumes that the obese of Nisbett and Kanouse are really Moderately Obese as defined in this study. From their data this appears to be a reasonable assumption.

Thus several empirical studies tend to support the notion that sex differences are important in the study of obesity. If there is to be an accurate summary statement of the External Hypothesis, it must include some recognition of these gender-related differences. Physiological and sex role differences may be able to account for these sex differences but they have only recently begun to be investigated in the literature. Hasty speculative explanations seem unwise when simple factors might account for the differences. For example, one such simple factor could be the sex of both the E and the Ss. The study of Schachter and Gross (1968) used an E of the same sex as the Ss while the present study used an E of the opposite sex to that of the Ss. Certainly these factors need to be researched further if they are to be adequately integrated into our understanding of obesity.

Several other possible differences are apparent between the study of Schachter and Gross (1968) and the present study which may account for the differences in findings. One is the age of the Ss. The Ss used here were on the average, up to ten years older than those in Schachter and Gross. Further, S income was not reported in Schachter and Gross and could conceivably be quite different from the incomes reported in this study. Studies by Moore, Stunkard and Srole (1962) and Goldblatt et. al. (1969) did find significant income or SEC effects in obesity. Finally S occupation may well have accounted for the differences. Most, if not all, of Schachter and Gross' Ss were students. In contrast, the present study used a much more heterogeneous S population.

Given these several differences between the Schachter and Gross (1968) study and the present investigation it is difficult to know which variables or combination of variables were responsible for the divergent findings. Obviously all of these factors are in need of further empirical investigation.

(4.2-4) Some Speculation

Several of the Semantic Differential ratings (see Appendix 2) revealed significant rating differences over the clock speed variable. On a common sense level there is no immediately obvious reason why the apparent time should have influenced the Ss ratings on the Semantic Differential. The most immediately obvious possibility is that the Ss were not randomly assigned to the Fast Clock and Slow Clock conditions. This is not felt to be a viable explanation in that, as was discussed in Chapter 2, the Ss were randomly assigned to the clock speed groups. Two other reasons for the rating differences on the Semantic Differential will be suggested. The first involves the Ss' subjective emotional reaction to the passage of time and the second involves possible cognitive mediation as the source of the clock speed effect.

All of the Ss in the Schachter and Gross (1968) study were scheduled at 5:00 P.M. This was based on the assumption that most people eat at 6:00 P.M. This procedure netted the results described in Section 3.2-3. After obtaining these results, Schachter and Gross realized that everyone does not eat at six. They then reanalyzed their data to take into account the effect of "usual eating time".

"The subjects were divided into categories according to the relationship of their usual dinner time to both clock time and actual time." (Schachter, 1971 (b), p. 96). The results of this reanalysis, according to Schachter and Gross, showed that obese Ss who were eating before their usual dinner time, ate more if the clock indicated it was after their usual dinner time, than if it indicated it was before. Those obese Ss who were eating after their usual dinner time ate less if the clock indicated it was before their usual dinner time and more if the clock indicated it was after their usual dinner time. No such differences were found for normals.

There are several problems with this reanalysis. First, the rearrangement of the data resulted in very small cell frequencies; in fact, one cell had only one subject and three cells had three Ss each. Further, Schachter and Gross drew conclusions based on a significance level of .07. Finally, and most seriously, they did not attempt to control the error rate experiment-wise in their post hoc comparisons. As Myers (1972, p. 357) suggests this procedure runs the risk of too frequently rejecting a true null hypothesis. Even in spite of these inferential problems related to their statistical procedures, Schachter and Gross assumed the findings of their reanalysis to reflect the "true state of affairs".

It is possible, however, to look at their findings in another way. Let us assume that the findings from their original analysis reflects the "true state of affairs" and that the findings from their reanalysis are an artifact of less than desirable statistical procedures. This would mean that the effect of the time manipulation was

not due to whether the apparent time on the clock was before or after the Ss usual time of eating. It might well be that the effect of the clock manipulation was a function of the Ss subjective emotional response to how they perceived the time to be passing. For example, an S might have felt that time was passing by rapidly in the Fast Clock condition, while another S might have felt that the time was dragging in the Slow Clock condition. This could have resulted in very different emotional responses which would have been reflected in different semantic differential ratings and, possibly, in different amounts eaten.[8]

This kind of analysis is, of necessity, purely speculative at this point, but it would be possible to investigate this hypothesis experimentally. This would involve scheduling Ss randomly throughout the day without regard to the Ss usual time of eating. If similar results were found it would indicate that the differential sensitivities to the time manipulation were a function of the Ss subjective

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[8]Some of the semantic differential findings could be interpreted as supporting this approach. These are findings 9, 10, and 12 from Section 3.8. Let us suppose that the Ss in the Fast Clock condition were angry at having apparently spent 40 to 50 minutes filling out forms (which they were not told of beforehand) with no indication that the desserts they came to taste would be immediately forthcoming. This could have resulted in different semantic differential ratings from those of their Slow Clock counterparts. For example, they rated their private selves more negatively ("How terrible of me to get angry about this trivial matter"); their ideal selves more negatively (as a result of the negative bias beginning in the private selves rating); and their private selves more potently ("I have more of an impact when I'm angry). Anecdotally several (15 to 20 Ss) reported a great deal of annoyance at remaining in the experimental room so long after completing the necessary forms. Some reported being ready to walk out. Unfortunately, when they expressed this annoyance, there was no way to determine in which clock speed group they belonged.

emotional reactions to the apparent passage of time. This interpretation would not necessarily require different results than those obtained in the present study. For example, scheduling Ss three hours before their usual dinner time would not necessarily change the outcome of this study because the Ss reaction to their perception of time passing could be expected to be the same whether it be an hour before supper or three hours before supper.

The second explanation for the rating differences over the clock speed variable will suggest that some cognitive events were mediating the clock speed effect. For example, in the main part of this study, Slow Clock Ss rated the desserts as tasting significantly better than the Fast Clock Ss. Even though the Ss Taste Ratings showed no significant relationship with the amount eaten, these differences in ratings suggest that some cognitive changes were taking place. It can be hypothesized that Ss in the Fast Clock condition were subjectively comparing the taste of the desserts with what they would normally be eating at that time, i.e., their usual supper or dinner time, and found the desserts wanting in terms of taste. No such comparisons would necessarily have been made by the Ss in the Slow Clock condition because they usually did not eat at the time indicated on the clock.

An extremely interesting Semantic Differential finding was the Clock Speed X Degree of Overweight interaction in the potency ratings of CALORIES. This interaction closely resembled the Clock Speed X Degree of Overweight interaction in the amount eaten data. That is, the Moderately Obese Ss in the Fast Clock condition rated CALORIES as

relatively potent and ate correspondingly little. In the Slow Clock condition they rated CALORIES as less potent and ate correspondingly more. For the Normal Weight Ss the effect was strongly the opposite. In the Fast Clock condition they rated CALORIES as relatively less potent and they ate correspondingly more. In the Slow Clock condition they rated CALORIES as relatively more potent and they ate correspondingly less. For the High Obese Ss, the effect resembled that of the Normal Weight Ss, but not as strongly. Thus, the CALORIES potency ratings were closely related with the amount eaten. The present data do not permit a determination of whether the effect was causative, or simply correlative, but they do strongly suggest that cognitive changes took place between the Fast Clock and Slow Clock conditions. The possible causative role of these changes could be investigated by designing a procedure where the potency ratings of CALORIES would be manipulated directly as independent variables, preferably within the same subject.

In a similar manner, Fast Clock Ss rated DESSERT as more active than did the Slow Clock Ss. One hypothesis to account for this effect would be that the longer the apparent time since one last ate, the more one would anticipate that food (in this case the promised dessert) would be active in reducing the deprivation.

Again these are purely speculative explanations for the differences in the various ratings over the clock speed variable. It is important, however, that these possibilities be explored further. It certainly would be important to know if these rating changes reflect cognitive changes that somehow mediate the differences in the amount

eaten. It is also important to know how these events might change over the various weight groups.

(4.3) The Notion of Set Point

There was little data in the main part of this study which validated the notion of Set Point. This can be a function of 2 factors: the first is that the concept is without merit; the second is that the concept was poorly operationalized in this study.

Initially the theoretical concept of Set Point will be discussed. Several parameters of Set Point need to be defined if it is to be a theoretically meaningful and useful concept. For example, it is unclear how much weight a person must lose to be "below set point". Is one or two lost pounds enough to put a person below set point? Nisbett (1972) suggests that people are thrown into a state of chronic hunger if they fall below their set point. It seems reasonable to consider the possibility that if some weight is lost, hunger is increased temporarily but that the person may eventually habituate to it, leaving him no longer unusually hungry. Most of the Ss in the Below Set Point-Diet group were dieting for some period of time. If they had habituated to their hunger it could have negated differences between the Set Point and Below Set Point-Diet groups in the main part of this study.

The results in the control section of this study indicate that there may have been some problems with the way in which the set point concept was operationalized here. Instead of reflecting a state of chronic hunger by eating more, the Below Set Point-No Diet group ate

significantly less than the other Normal Weight groups in the control part of this study. There were significant differences in terms of amount eaten between the Below Set Point-Diet group and the Below Set Point-No Diet group. The Below Set Point-No Diet group was included as the "purest" measure of the Below Set Point concept because it did not confound being Below Set Point and being on a diet. Thus, the Below Set Point-Diet groups may not have been the proper group to measure the Below Set Point phenomenon.

There were further differences among the normal weight groups. The Normal Weight Below Set Point-Diet and the Normal Weight At Set Point groups ate significantly less in the Slow Clock condition than in the Fast Clock condition. In contrast, the Normal Weight Below Set Point-No Diet groups showed no change in amount eaten between the Fast Clock and Slow Clock conditions. These divergent reactions to the clock speed variable proved to be significantly different. It is apparent that, at least for the Normal Weight Ss, the Below Set Point-Diet group had more in common with the At Set Point group than with the Below Set Point-No Diet group. These differences cannot be attributed to different percentages of weight lost since these proved to be the same for these three Normal Weight groups. These findings strongly suggest that the Normal Weight Below Set Point-Diet group was not the best operationalization of the below set point phenomenon. It is not possible to tell from the present data how these findings would apply to the Moderately Obese and High Obese Ss, but it is apparent that further investigation in this area is critical.

In Section 3.2-2 it was suggested that the High Obese Ss respond

to too many stimuli with eating. It appears that the Below Set Point-No Diet groups similarly do not respond differentially to the time cues. In fact, they seem to be "overcontrolling" their eating which leads them to eat significantly less than the other Normal Weight Ss. The Normal Weight Below Set Point-Diet groups may have learned to adjust their food intake to below that necessary to maintain their weight at their prediet levels. Thus, they share in common with the High Obese a lack of differential responding to the time cue but, in contrast to the High Obese, they have learned to restrict their intake when they do eat. The E informally observed that the Below Set Point-No Diet group members were very concerned about their physical appearance; they were generally young, well-dressed women. Instead of being women who "dropped out of dieting", they seemed rather to be women who were intent on remaining slim. The data indicate that they may well have learned to adjust their food intake downward to meet this goal.

(4.4) Success of the Time Manipulation

Schachter and Gross (1968) reported that only 3 out of 46 (6.5 percent) of their Ss made any comments about the gimmicked clocks. In the present study 12 out of 132 (9 percent) Ss verbally described the clock manipulation. These percentages do not appear to be very different.

Of the 98 Ss used in the final data analysis here, none could verbally describe the clock manipulation. In some cases the time manipulation was extremely successful. Two Ss walked out of the pro-

cedure because, according to the apparent time, they were late for appointments; in actual time they were twenty minutes early, however! Many Ss reported being suspicious or vaguely uncomfortable about the clocks. None reported actually disbelieving or disregarding the clock entirely, however.

(4.5) Semantic Differential Data

The semantic differential was included primarily to occupy the Ss' time while the clock was being speeded up or slowed down. Its secondary function was to supply useful data. The concepts included were chosen with no particular theoretical aim or significance. The semantic differential data has been used as suggestive in those areas where it provided information about the Ss' subjective reaction to the experimental procedure. For example, all of the significant effects involving the clock speed variable were discussed in Section 3.2-4 and were used as hypotheses generators. This proved to be a valuable function for the semantic differential data.

In several cases the semantic differential data added some validity to the way in which the experimental groups were conceived and formed. The finding that the Below Set Point-Diet Ss rated DIET as significantly more potent than the At Set Point Ss suggests intuitively reasonable differences between these two groups. Similarly the finding that the Ss At Set Point rated CALORIES significantly more positively than Ss Below Set Point-Diet suggests that there are differences between these 2 groups even though the differences did not show up in amount eaten.

The High Obesity Ss rated themselves as significantly more potent than did either the Moderately Obese or Normal Weight Ss. This difference is in the direction one would predict on a common sense level if potency means physical power or presence. Likewise, the High Obese and Moderately Obese Ss rated their public selves as significantly more potent than did the Normal Weight Ss--again an intuitively reasonable finding.

The Normal Weight Below Set Point-No Diet group rated CALORIES significantly less positively than the Normal Weight At Set Point and the Normal Weight Below Set Point-Diet group. As was suggested in Section 3.3, the Normal Weight Below Set Point-No Diet group may be extremely concerned about their weight.

These rating differences may reflect the sensitivity of the Below Set Point-No Diet Ss to CALORIES and to their potential for causing weight gain.

The findings of the present study can be useful in guiding future investigations of cognitive events which may influence the Ss' response to both external and internal cues. Grouping according to semantic differential ratings or directly manipulating those ratings in an experimental situation would add considerably to our understanding of the relative relationship of these events to obesity and overeating.

(4.6) The Current State of the External Hypothesis

The results of this study plus those of Rudman (1973) and Johnson (1970) suggest that Schachter was premature in stating that

the external hypothesis accounts for obesity. The present data strongly indicate (and Johnson's study tends to confirm) that the degree of a person's overweight must be considered if accurate predictions are to be made about a person's sensitivity to external cues. Rudman's study strongly suggests, and the present study tends to confirm, the notion that gender is also critical in any statement of the relationship between external cues and eating behavior. The findings of the present study also show that the external hypothesis can even be used to account for the eating of Normal Weight females. It is too simplistic, in light of these findings, to state that responsiveness to external cues is a direct function of weight. It appears that all weight groups have their eating behavior controlled to a rather large extent by external cues. The critical variable seems to be what controls the amount they eat once they have begun responding to the external cue. It was suggested in this discussion that the taste of the food may be the critical factor.

In the studies investigating: (1) Manipulated time (Schachter and Gross, 1968; the present study), (2) food visibility (Nisbett, 1968a; Rudman, 1973), (3) taste (Nisbett, 1968a; Decke--cited in Schachter, 1971) (4) adjustment to new eating schedules (Goldman, Jaffa, and Schachter, 1968) only two levels of the independent variables were used. From these findings it is not possible to state in detail the form of the relationship between amount eaten and the external or internal cues. For example, the present study developed an hypothesis based on faulty stimulus control and taste. This hypothesis, however, was based on speculation beyond the available data be-

cause only two levels of the time cue were used. This situation must be remedied in future investigations. The reasons are obvious.

Further, in all of the above studies, only one level of deprivation was used (approximately 4 hours). We do not know the effect of greater periods of deprivation on amount eaten and its relationship to either internal or external cues.

Finally, the present study failed to support other predictions based either on Schachter's (1967) original statement of the external hypothesis or Nisbett's (1972) suggested modifications of it. In this study the Below Set Point Ss did not rate their hunger as higher than the At Set Point Ss as would be predicted by Nisbett. Nor do the present data support the prediction of a positive correlation between taste rating and amount eaten for the Below Set Point Diet Ss. The failure to obtain significant correlations in these areas may be due to the low within group variability of these various ratings. Correlational relationships require within group variability. Since the great majority of the Ss rated the various factors similarly, no significant correlations would be expected. More distinct taste, or hunger differences may be required if significant correlations between them and amount eaten are to be found.

(4.7) Further research

Further research into the Set Point phenomenon is indicated. One possible way of eliminating some of the interpretive problems concerning Set Point would be to initiate a longitudinal study. Ss, falling into the various weight categories, could be obtained and

they could be followed through a weight loss and maintenance. Measures of their external sensitivity could be taken in the various stages of dieting and weight control in a manner similar to that of Cabanac, et. al. (1971). Their study, however, suffered methodologically from using themselves as Ss. The proposal put forth here would eliminate that difficulty. One of the major problems of this and probably any similar weight loss study is obtaining an accurate weight history. Even for those who lost weight, finding out when they started to diet and how long they had been dieting was an extremely difficult task. It is obvious from the weight discrepancy data that female Ss are unreliable reporters of their weight. A longitudinal study would help to eliminate these difficulties. Finally, Ss in a repeated measures design could be chosen to fit not only certain weight criteria but also certain other criteria such as income or age. A repeated measures design would also have the advantage of obtaining equal statistical power with fewer Ss.

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(5.0) Appendix 1

The Commonwealth of Massachusetts
University of Massachusetts
Amherst 01002

To:

______________________________M.D.

______________________________Address

____

Please send the height and weight records from the past two years of X____________________________ to Mr. William E. Ford, Department of Psychology, University of Massachusetts, Amherst, Mass. 01002. I have participated in a food tasting study conducted by the Department and they are in need of this information. I am granting permission for you to release this data. Enclosed is a form for you to use plus a self addressed stamped envelop.

Thank you,

(Signed) X____________________________

(Date) ____________________________

Witnessed by:

____

(Date)__________________________

HEIGHT AND WEIGHT RECORD FOR X ______________________

Date	Height	Weight
1.		
2.		
3.		
4.		
5.		

Comments:

(Signed) ______________________

Physician's Reply Card

The Commonwealth of Massachusetts
University of Massachusetts
Amherst 01002

HUNGER RATING FORM

Please estimate how hungry you feel:

1. Not at all
2. A little
3. Moderately
4. Distinctly
5. Extremely

(Signed)______________________

To the "Taster":

Thank you for volunteering! Enclosed is a specially prepared folio that includes all of the forms you will need in this taste study.

As you probably know, this kind of marketing research is complicated and tricky. We need information about you and your background if we are to make sense of everyone's ratings. Please be patient in filling out the necessary forms. It may seem long and involved, but it is absolutely necessary if we are to understand the public's response to our new, low-calorie dessert.

Please fill out the questionaires up to the blank page. For the forms after the blank page, you will receive instructions from Mr. Ford.

We feel certain that you will enjoy your time here. Thank you again.

GENERAL FOODS COMPANY

The Commonwealth of Massachusetts
University of Massachusetts
Amherst 01002

In order for us to be sure that you have not eaten we would like you to sign the following statement if it is true for you.

I have not eaten within the last four hours as requested.

(Signed) X ________________________

CONFIDENTIAL BACKGROUND INFORMATION

Name:______________________________ Age:__________

Address:____

Telephone Number:____________ Number of Children________

Marital Status:____M ____S ____D ____Other

Occupation: __________________________ Approx. Yearly

Husband's Occupation:___________________ Income:________

What is your height?________________ Weight?____________

Are you currently on a diet? ____Yes ____No

If you are not currently on a diet, when was the last time you dieted?____

If you are on a diet, what was your average weight in the 2 years prior to your diet?____________________________

If you are a member of a diet group, how long have you been a regularly attending member?____________________________

If you are on a diet, what kind is it? (e.g., Weight Watchers, Diet Workshop, Dr. Atkin's, etc.)________________________

Are you a "clean your plate" type, or are you likely to leave something when you eat?

__________________I nearly always clean my plate

__________________I sometimes clean my plate and sometimes leave something

__________________I nearly always leave something

List the foods that you would include in your "ideal" meal, assuming you could have anything you want:

THANK YOU!

It is important for us to know how you compare with other people who are participating in this study if we are to "make sense" out of your taste rating. The purpose of this questionaire is to measure if certain concepts mean the same to you as they do to other participants. In filling out this questionaire, please judge the words on the basis of what they mean to you. Each page will present a concept (such as DICTATOR), and a scale (such as HIGH-LOW). You are to rate the concept on the 7-point scale indicated.

If you feel that the concept is very closely associated with one end of the scale, you might place your check mark as follows:

DICTATOR

UP_____:_____:_____:_____:_____:_____:__X__DOWN

If you feel that the concept is quite closely related to one side of the scale, you might check as follows:

HOUSE

STRAIGHT_____:__X__:_____:_____:_____:_____:_____CROOKED

If the concept seems only slightly related to one side as opposed to the other, you might check as follows:

CLOUD

EASY_____:_____:__X__:_____:_____:_____:_____DIFFICULT

If you consider the scale completly irrelevant, or both sides equally associated, you would check the middle space on the scale:

TREE

IDEALISTIC_____:_____:_____:__X__:_____:_____:_____REALISTIC

Work at fairly high speed, without worrying or puzzling over the individual items for long periods. It is your first impression that is most important. Of course, some of the items will seem highly irrelevant to you. Please give the best judgement you can and move along.

DIET
____

PLEASANT ___ : ___ : ___ : ___ : ___ : ___ : ___ UNPLEASANT

TASTY ___ : ___ : ___ : ___ : ___ : ___ : ___ DISTASTEFUL

FAIR ___ : ___ : ___ : ___ : ___ : ___ : ___ UNFAIR

LARGE ___ : ___ : ___ : ___ : ___ : ___ : ___ SMALL

HEAVY ___ : ___ : ___ : ___ : ___ : ___ : ___ LIGHT

STRONG ___ : ___ : ___ : ___ : ___ : ___ : ___ WEAK

FAST ___ : ___ : ___ : ___ : ___ : ___ : ___ SLOW

ACTIVE ___ : ___ : ___ : ___ : ___ : ___ : ___ PASSIVE

HOT ___ : ___ : ___ : ___ : ___ : ___ : ___ COLD

NICE ___ : ___ : ___ : ___ : ___ : ___ : ___ AWFUL

FOOD

PLEASANT____:____:____:____:____:____:____UNPLEASANT

TASTY____:____:____:____:____:____:____DISTASTEFUL

FAIR____:____:____:____:____:____:____UNFAIR

LARGE____:____:____:____:____:____:____SMALL

HEAVY____:____:____:____:____:____:____LIGHT

STRONG____:____:____:____:____:____:____WEAK

FAST____:____:____:____:____:____:____SLOW

ACTIVE____:____:____:____:____:____:____PASSIVE

HOT____:____:____:____:____:____:____COLD

NICE____:____:____:____:____:____:____AWFUL

____OBESITY________________

PLEASANT_____:_____:_____:_____:_____:_____:_____UNPLEASANT

TASTY_____:_____:_____:_____:_____:_____:_____DISTASTEFUL

FAIR_____:_____:_____:_____:_____:_____:_____UNFAIR

LARGE_____:_____:_____:_____:_____:_____:_____SMALL

HEAVY_____:_____:_____:_____:_____:_____:_____LIGHT

STRONG_____:_____:_____:_____:_____:_____:_____WEAK

FAST_____:_____:_____:_____:_____:_____:_____SLOW

ACTIVE_____:_____:_____:_____:_____:_____:_____PASSIVE

HOT_____:_____:_____:_____:_____:_____:_____COLD

NICE_____:_____:_____:_____:_____:_____:_____AWFUL

DESSERT

PLEASANT_____:_____:_____:_____:_____:_____:_____UNPLEASANT

TASTY_____:_____:_____:_____:_____:_____:_____DISTASTEFUL

FAIR_____:_____:_____:_____:_____:_____:_____UNFAIR

LARGE_____:_____:_____:_____:_____:_____:_____SMALL

HEAVY_____:_____:_____:_____:_____:_____:_____LIGHT

STRONG_____:_____:_____:_____:_____:_____:_____WEAK

FAST_____:_____:_____:_____:_____:_____:_____SLOW

ACTIVE_____:_____:_____:_____:_____:_____:_____PASSIVE

HOT_____:_____:_____:_____:_____:_____:_____COLD

NICE_____:_____:_____:_____:_____:_____:_____AWFUL

__CALORIES________________

PLEASANT____:____:____:____:____:____:____UNPLEASANT

TASTY____:____:____:____:____:____:____DISTASTEFUL

FAIR____:____:____:____:____:____:____UNFAIR

LARGE____:____:____:____:____:____:____SMALL

HEAVY____:____:____:____:____:____:____LIGHT

STRONG____:____:____:____:____:____:____WEAK

FAST____:____:____:____:____:____:____SLOW

ACTIVE____:____:____:____:____:____:____PASSIVE

HOT____:____:____:____:____:____:____COLD

NICE____:____:____:____:____:____:____AWFUL

ME, AS I AM

PLEASANT	___ :	___ :	___ :	___ :	___ :	___ : ___	UNPLEASANT
TASTY	___ :	___ :	___ :	___ :	___ :	___ : ___	DISTASTEFUL
FAIR	___ :	___ :	___ :	___ :	___ :	___ : ___	UNFAIR
LARGE	___ :	___ :	___ :	___ :	___ :	___ : ___	SMALL
HEAVY	___ :	___ :	___ :	___ :	___ :	___ : ___	LIGHT
STRONG	___ :	___ :	___ :	___ :	___ :	___ : ___	WEAK
FAST	___ :	___ :	___ :	___ :	___ :	___ : ___	SLOW
ACTIVE	___ :	___ :	___ :	___ :	___ :	___ : ___	PASSIVE
HOT	___ :	___ :	___ :	___ :	___ :	___ : ___	COLD
NICE	___ :	___ :	___ :	___ :	___ :	___ : ___	AWFUL

ME, AS OTHERS SEE ME

PLEASANT____:____:____:____:____:____:____UNPLEASANT

TASTY____:____:____:____:____:____:____DISTASTEFUL

FAIR____:____:____:____:____:____:____UNFAIR

LARGE____:____:____:____:____:____:____SMALL

HEAVY____:____:____:____:____:____:____LIGHT

STRONG____:____:____:____:____:____:____WEAK

FAST____:____:____:____:____:____:____SLOW

ACTIVE____:____:____:____:____:____:____PASSIVE

HOT____:____:____:____:____:____:____COLD

NICE____:____:____:____:____:____:____AWFUL

ME, AS I WOULD LIKE TO BE

PLEASANT_____:_____:_____:_____:_____:_____:_____UNPLEASANT

TASTY_____:_____:_____:_____:_____:_____:_____DISTASTEFUL

FAIR_____:_____:_____:_____:_____:_____:_____UNFAIR

LARGE_____:_____:_____:_____:_____:_____:_____SMALL

HEAVY_____:_____:_____:_____:_____:_____:_____LIGHT

STRONG_____:_____:_____:_____:_____:_____:_____WEAK

FAST_____:_____:_____:_____:_____:_____:_____SLOW

ACTIVE_____:_____:_____:_____:_____:_____:_____PASSIVE

HOT_____:_____:_____:_____:_____:_____:_____COLD

NICE_____:_____:_____:_____:_____:_____:_____AWFUL

Plate 1

<u>Sweetness Rating</u>

I found this gelatin to be:

1. Not at all sweet
2. A little sweet
3. Moderately sweet
4. Distinctly sweet
5. Extremely sweet

<u>Color Rating</u>

I found the coloring of this gelatin to be:

1. too weak
2. a little weak
3. Just about right
4. a little strong
5. too strong

<u>Comparison Ratings</u>

In comparison with other low calorie fruit gelatins, I found this gelatin to be:

1. better than most
2. about the same
3. worse than most

In comparison with other regular fruit gelatins, I found this gelatin to be:

1. better than most
2. about the same
3. worse than most

Plate 2

Sweetness Rating

I found this gelatin to be:

1. Not at all sweet
2. A little sweet
3. Moderately sweet
4. Distinctly sweet
5. Extremely sweet

Color Rating

I found the coloring of this gelatin to be:

1. too weak
2. a little weak
3. Just about right
4. a little strong
5. too strong

Comparison Ratings

In comparison with other low calorie fruit gelatins, I found this gelatin to be:

1. better than most
2. about the same
3. worse than most

In comparison with other regular fruit gelatins, I found this gelatin to be:

1. better than most
2. about the same
3. worse than most

Plate 3

Sweetness Rating

I found this gelatin to be:

1. Not at all sweet
2. A little sweet
3. Moderately sweet
4. Distinctly sweet
5. Extremely sweet

Color Rating

I found the coloring of this gelatin to be:

1. too weak
2. a little weak
3. Just about right
4. a little strong
5. too strong

Comparison Ratings

In comparison with other low calorie fruit gelatins, I found this gelatin to be:

1. better than most
2. about the same
3. worse than most

In comparison with other regular fruit gelatins, I found this gelatin to be:

1. better than most
2. about the same
3. worse than most

Plate 1

Taste RAting

Please circle your rating for each sample. This will not be an easy task, so take your time. You will have about 20 minutes to taste and rate so please do as careful a job as you can. Circle one:

Overall, the taste was:

6. Excellent
5. Very Good
4. Fairly Good
3. Not very good
2. Bad
1. Terrible

I would recomend this gelatin to my friends as a generally good low calorie dessert:

__________Yes __________No

Plate 2 ____________

Taste RAting

Please circle your rating for each sample. This will not be an easy task, so take your time. You will have about 20 minutes to taste and rate so please do as careful a job as you can.

Circle one:

Overall, the taste was:

6. Excellent
5. Very Good
4. Fairly Good
3. Not very good
2. Bad
1. Terrible

I would recomend this gelatin to my friends as a generally good low calorie dessert:

__________Yes __________No

Plate____3____

Taste RAting

Please circle your rating for each sample. This will not be an easy task, so take your time. You will have about 20 minutes to taste and rate so please do as careful a job as you can.

Circle one:

Overall, the taste was:

6. Excellent
5. Very Good
4. Fairly Good
3. Not very good
2. Bad
1. Terrible

I would recomend this gelatin to my friends as a generally good low calorie dessert:

__________Yes ___________No

(6.0) Appendix 2

(6.1) Semantic Differential Data

The Semantic Differential was included primarily to act as a way to occupy the Ss while the time on the clocks was being manipulated. It was included secondarily as a way to obtain empirical data. Because of this, specific hypotheses were not formulated. There are, of course, certain problems with this approach. The first is that the data analysis can take the form of a "fishing expedition", i.e., a disorganized search for significant findings. The Semantic Differential can provide a great deal of information and there are many possible analyses that can be done, including many interconcept comparisons. Because so many analyses can be performed, there is a high risk of obtaining results that are significant by chance; further, with too many significant findings the data could become too massive to integrate meaningfully. The course chosen here was to analyze the data from each scale for each concept individually to determine if they might provide information related to the hypotheses of this study (see Section 1.7). Hopefully the data analysis here is not so exhaustive as to run into the above problems nor is it so limited as to provide too little information.

(6.1-1) The Concept DIET

(6.1-1.1) Evaluative Ratings

The mean evaluative ratings of DIET and their variances and an ANOVA performed on this data are summarized in Table A1. No statistically significant effects were found. One main effect approached

Table A1

Mean Evaluative Ratings for the concept DIET and their Variances
(Variances appear in parentheses)

High Obese	Fast Clock	Slow Clock	
At Set Point	4.25(1.23)	4.68 (.91)	
Below Set Point	4.50(1.31)	3.46(1.28)	$\bar{X}$ High Obese = 4.22

Moderate Obese	Fast Clock	Slow Clock	
At Set Point	4.39(2.02)	4.86 (.43)	
Below Set Point	3.29(3.22)	3.71(2.80)	$\bar{X}$ Mod. Obese = 4.06

Normal Weight	Fast Clock	Slow Clock	
At Set Point	3.68(1.43)	3.75(3.04)	
Below Set Point	3.68(2.04)	3.79(1.53)	$\bar{X}$ Normal = 3.72

$\bar{X}$ At Set Point = 4.27 $\bar{X}$ Fast Clock = 3.96

$\bar{X}$ Below Set Point = 3.74 $\bar{X}$ Slow Clock = 4.04

Hartley's test = 7.40 (a=12, 6 df)

Analysis of Variance for Evaluative Ratings of DIET

Source	df	MS	F
Weight Group	2	1.82	1.03
Set Point Class.	1	5.89	3.33($p<.10$)
Clock Speed	1	.13	<1
Weight Group X Set Point Class.	2	2.30	1.30
Weight Group X Clock Speed	2	.99	<1
Set Point Class. X Clock Speed	1	1.25	<1
Weight Group X Set Point Class. X Clock Speed	2	1.25	<1
Error	72	1.77	

statistical significance (p<.10). The Ss At Set Point rated DIET more negatively than those Ss Below Set Point-Diet. This is intuitively reasonable considering the investment that Below Set Point-Diet Ss have in dieting. It would be expected that people who are on a diet would be more favorably disposed toward the concept of DIET than those who are not on a diet. The former would have to deal with a great deal of dissonance if this were not the case. This finding, however, is significant at a somewhat uncomfortable level. The overall evaluative rating was neutral (4.0).

(6.1-1.2) Potency Ratings

The mean potency ratings for DIET and their variances plus a summary of an ANOVA performed on this data appear in Table A2. There was a significant (p<.05) Set Point Classification effect. The Below Set Point-Diet group rated DIET as significantly (p<.05) more potent than the At Set Point groups. The At Set Point Ss rated DIET between neutral and slightly impotent (4.58). The Below Set Point-Diet Ss rated DIET between slightly potent and neutral (3.88). This finding is again intuitively reasonable. People who have dieted and who have lost weight should see the concept DIET as more efficacious than those who have not dieted and who have not lost weight on that diet. There is no way to determine, of course, if this difference is the cause or the result of the diet. Thus, people who see DIETs as more potent may be inclined to diet more than those who view DIETs as less potent. This finding adds a kind of construct validity to the concepts of being At- or Below Set Point, with being on a diet or not

Table A2

Mean Potency Ratings for the concept DIET and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	4.71(1.68)	3.95(1.64)	
Below Set Point	4.05(2.64)	3.14(1.66)	$\bar{X}$ High Obese = 3.96

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	4.43(2.40)	4.76(2.29)	
Below Set Point	4.09(2.11)	3.67(1.67)	$\bar{X}$ Moderate Obese = 4.24

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	4.19(2.66)	5.43(1.40)	
Below Set Point	4.05(2.17)	4.28(1.53)	$\bar{X}$ Normal = 4.49

$\bar{X}$ At Set Point = 4.58 $\bar{X}$ Fast Clock = 4.25

$\bar{X}$ Below Set Point = 3.88 $\bar{X}$ Slow Clock = 4.20

Hartley's test = 1.90 (a=12, 6 df)

Analysis of Variance for Potency ratings of DIET

Source	df	MS	F
Weight Group	2	1.92	<1
Set Point Class.	1	10.26	5.16($p<.05$)
Clock Speed	1	.05	<1
Weight Group X Set Point Class.	2	.02	<1
Weight Group X Clock Speed	2	4.33	2.18
Set Point Class. X Clock Speed	1	2.12	1.07
Weight Group X Set Point Class. X Clock Speed	2	.34	<1
Error	72	1.99	

being on a diet as the operational definitions of these concepts. The overall potency rating was just slightly below a neutral rating (4.23).

(6.1-1.3) Activity Ratings

The mean activity ratings for DIET and their variances plus a summary of an ANOVA performed on this data appear in Table A3. No statistically significant effects were found. Two interaction effects approached statistical significance ($p<.10$). The first was a Degree of Overweight X Clock Speed interaction and the second was a three-way interaction among the Degree of Overweight X Set Point Classification X Clock speed variables. Contrasts on these means would not yield significant results and they will not be dealt with on a theoretical level. The overall mean Activity rating was between slightly active and neutral (3.84).

(6.1-2) The concept FOOD

No significant effects were found on any of the scales for the concept FOOD. The means, etc., appear in Tables A4 through A6. The overall evaluative rating for food was slightly positive (2.15). The overall potency rating was between neutral and slightly potent (3.63). The overall activity rating was slightly potent (3.34).

(6.1-3) The concept OBESITY

Interestingly there were no statistically significant effect on any of the scales for the concept OBESITY. The means, etc., appear

Table A3

Mean Activity Ratings for DIET and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	4.00 (.52)	4.09 (.40)	
Below Set Point	4.71(1.51)	3.28(1.61)	$\bar{X}$ High Obese = 4.02

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	3.95 (.35)	4.04 (.72)	
Below Set Point	3.28(1.20)	4.00(1.71)	$\bar{X}$ Mod. Obese = 3.82

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	3.52 (.55)	4.04 (.13)	
Below Set Point	3.57 (.51)	3.52 (.44)	$\bar{X}$ Normal = 3.66

$\bar{X}$ At Set Point = 3.94　　$\bar{X}$ Fast Clock = 3.84

$\bar{X}$ Below Set Point = 3.73　　$\bar{X}$ Slow Clock = 3.83

Hartley's test = 11.70 (a=12, 6 df)

Analysis of Variance for Activity Ratings of DIET

Source	df	MS	F
Weight Group	2	.90	1.18
Set Point Class.	1	.96	1.26
Clock Speed	1	.0013	<1
Weight Group X Set Point Class.	2	.17	<1
Weight Group X Clock Speed	2	2.32	3.05(p<.10)
Set Point Class. X Clock Speed	1	1.27	1.66
Weight Group X Set Point Class. X Clock Speed	2	2.02	2.65(p<.10)
Error	72	.76	

Table A4

Mean Evaluative Ratings for FOOD and their variances
(Variances appear in parentheses)

High Obese	Fast Clock	Slow Clock	
At Set Point	1.82 (.25)	2.82(2.62)	
Below Set Point	2.14 (.43)	2.54 (.32)	$\bar{X}$ High Obese = 2.34

Moderate Obese	Fast Clock	Slow Clock	
At Set Point	1.61 (.10)	2.12(1.63)	
Below Set Point	2.46(1.03)	2.11(1.19)	$\bar{X}$ Mod. Obese = 2.07

Normal Weight	Fast Clock	Slow Clock	
At Set Point	1.71 (.34)	1.96 (.43)	
Below Set Point	2.37 (.83)	2.11 (.60)	$\bar{X}$ Normal = 2.04

$\bar{X}$ At Set Point = 2.01 $\bar{X}$ Fast Clock = 2.03

$\bar{X}$ Below Set Point = 2.29 $\bar{X}$ Slow Clock = 2.28

Hartley's test = 1.75 (a=12, 6 df)

Analysis of Variance for Evaluative Ratings of FOOD

Source	df	MS	F
Weight Group	2	.76	<1
Set Point Class.	1	1.57	1.94
Clock Speed	1	1.31	1.62
Weight Group X Set Point Class.	2	.39	<1
Weight Group X Clock Speed	2	.98	1.21
Set Point Class. X Clock Speed	1	2.22	2.73
Weight Group X Set Point Class. X Clock Speed	2	.06	<1
Error	72	.81	

Table A5

Mean Potency Ratings for FOOD and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	3.57(1.28)	3.38 (.76)	
Below Set Point	3.38(2.46)	3.81 (.51)	$\bar{X}$ High Obese = 3.53

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	3.35(1.47)	3.76 (.73)	
Below Set Point	3.42 (.66)	4.38(2.02)	$\bar{X}$ Mod. Obese = 3.73

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	3.47 (.26)	4.19 (.55)	
Below Set Point	3.66(2.03)	3.43 (.14)	$\bar{X}$ Normal = 3.69

$\bar{X}$ At Set Point = 3.62 $\bar{X}$ Fast Clock = 3.48

$\bar{X}$ Below Set Point = 3.68 $\bar{X}$ Slow Clock = 3.82

Hartley's test = 17.99 (a=12, 6 df)

Analysis of Variance for Potency Ratings of FOOD

Source	df	MS	F
Weight Group	2	.29	<1
Set Point Class.	1	.07	<1
Clock Speed	1	2.51	2.35
Weight Group X Set Point Class.	2	.71	<1
Weight Group X Clock Speed	2	.61	<1
Set Point Class. X Clock Speed	1	.03	<1
Weight Group X Set Point Class. X Clock Speed	2	1.37	1.28
Error	72	1.07	

Table A6

Mean Activity Ratings for FOOD and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	2.90 (.92)	3.57(1.03)	
Below Set Point	3.52(1.88)	3.57 (.36)	$\overline{X}$ High Obese = 3.39

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	3.47 (.33)	3.37 (.76)	
Below Set Point	3.19 (.81)	3.23(1.51)	$\overline{X}$ Mod. Obese = 3.32

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	3.57 (.93)	3.19 (.22)	
Below Set Point	3.14 (.77)	3.33 (.96)	$\overline{X}$ Normal = 3.31

$\overline{X}$ At Set Point = 3.35 $\overline{X}$ Fast Clock = 3.30

$\overline{X}$ Below Set Point = 3.33 $\overline{X}$ Slow Clock = 3.38

Hartley's test = 8.59 (a=12, 6 df)

Analysis of Variance for Activity Ratings of FOOD

Source	df	MS	F
Weight Group	2	.06	<1
Set Point Class.	1	.0053	<1
Clock Speed	1	.13	<1
Weight Group X Set Point Class.	2	.56	<1
Weight Group X Clock Speed	2	.42	<1
Set Point Class. X Clock Speed	1	.0057	<1
Weight Group X Set Point Class. X Clock Speed	2	.64	<1
Error	72	.87	

in Tables A7 through A9. On the activity dimension there was one effect approaching statistical significance ($p<.10$). Ss Below Set Point-Diet rated OBESITY as more active than those At Set Point. It is important to note, however, that Hartley's test was significant (28.45; a=12; 6 df; $p<.05$) indicating significant heterogeneity of variance.

The overall potency rating of OBESITY was slightly potent (2.89). The overall activity rating was between neutral and slightly inactive (4.75). The mean overall evaluative rating of OBESITY was 6.36. The Semantic Differential scales range from 1 to 7. It is obvious that the Ss rated OBESITY close to the top (negative) end of the scale. This may reflect the very high negative loading that society places on the concept of obesity. The lack of finding significant evaluative effects may be a result of a "ceiling effect"; that is, the range of the Semantic Differential may not have been extensive enough to measure differences among very negative attitudes.

(6.1-4) The concept DESSERT

(6.1-4.1) Evaluative Ratings

The mean evaluative ratings for the concept DESSERT and their variances appear in Table A10. An ANOVA was performed on this data to determine if there are any significant effects. This analysis is also summarized in Table A10. As can be seen one main effect, Degree of Overweight, and one interaction effect, Degree of Overweight X Clock Speed, were significant.

To determine which differences were responsible for the signifi-

Table A7

Mean Evaluative Ratings of OBESITY and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	6.68 (.29)	6.57 (.56)	
Below Set Point	6.32 (.81)	6.25 (.42)	$\overline{X}$ High Obese = 6.46

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	6.36 (.48)	6.54 (.32)	
Below Set Point	6.43 (.49)	6.14 (.62)	$\overline{X}$ Mod. Obese = 6.37

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	6.11 (.60)	6.11 (.52)	
Below Set Point	6.39 (.16)	6.39 (.41)	$\overline{X}$ Normal = 6.25

$\overline{X}$ At Set Point = 6.39 $\overline{X}$ Fast Clock = 6.38

$\overline{X}$ Below Set Point = 6.32 $\overline{X}$ Slow Clock = 6.33

Hartley's test = 4.93 (a=12, 6 df)

Analysis of Variance for Evaluative Ratings of OBESITY

Source	df	MS	F
Weight Group	2	.30	<1
Set Point Class.	1	.11	<1
Clock Speed	1	.05	<1
Weight Group X Set Point Class.	2	.73	1.53
Weight Group X Clock Speed	2	.01	<1
Set Point Class. X Clock Speed	1	.11	<1
Weight Group X Set Point Class. X Clock Speed	2	.14	<1
Error	72	.47	

Table A8

Mean Potency Ratings of OBESITY and their Variances
(Variances appear in parentheses)

High Obese	Fast Clock	Slow Clock	
At Set Point	2.71(1.57)	3.33(2.22)	
Below Set Point	2.95 (.68)	2.90 (.81)	$\bar{X}$ High Obese = 2.97

Moderate Obese	Fast Clock	Slow Clock	
At Set Point	2.81 (.92)	2.71 (.16)	
Below Set Point	2.19 (.37)	2.57(1.81)	$\bar{X}$ Mod. Obese = 2.82

Normal Weight	Fast Clock	Slow Clock	
At Set Point	3.19(3.36)	2.81 (.81)	
Below Set Point	2.92(1.62)	2.50 (.79)	$\bar{X}$ Normal = 2.85

$\bar{X}$ At Set Point = 2.93 $\bar{X}$ Fast Clock = 2.80
$\bar{X}$ Below Set Point = 2.84 $\bar{X}$ Slow Clock = 2.97

Hartley's test = 9.19 (a=12, 6 df)

Analysis of Variance for the Potency Ratings of OBESITY

Source	df	MS	F
Weight Group	2	.19	<1
Set Point Class.	1	.17	<1
Clock Speed	1	.65	<1
Weight Group X Set Point Class.	2	.30	<1
Weight Group X Clock Speed	2	1.96	1.55
Set Point Class. X Clock Speed	1	.35	<1
Weight Group X Set Point Class. X Clock Speed	2	2.12	1.68
Error	72	1.26	

Table A9

Mean Activity Ratings of OBESITY and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	4.43(2.25)	4.38(1.53)	
Below Set Point	4.28(1.83)	5.05(1.20)	$\bar{X}$ High Obese = 4.53

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	5.00 (.96)	5.57 (.73)	
Below Set Point	4.71(1.16)	4.33(1.19)	$\bar{X}$ Mod. Obese = 4.90

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	5.14 (.11)	5.33 (.74)	
Below Set Point	4.24(1.51)	4.47(3.00)	$\bar{X}$ Normal = 4.80

$\bar{X}$ At Set Point = 4.97 $\bar{X}$ Fast Clock = 4.63

$\bar{X}$ Below Set Point = 4.51 $\bar{X}$ Slow Clock = 4.86

Hartley's test = 28.45 (a=12, 6 df) $p<.05$

Analysis of Variance for Activity Ratings of OBESITY

Source	df	MS	F
Weight Group	2	1.01	<1
Set Point Class.	1	4.44	3.29(p<.10)
Clock Speed	1	1.04	<1
Weight Group X Set Point Class.	2	2.76	2.04
Weight Group X Clock Speed	2	.12	<1
Set Point Class. X Clock Speed	1	.0062	<1
Weight Group X Set Point Class. X Clock Speed	2	1.37	1.01
Error	72	1.35	

Table A10

Mean Evaluative Ratings of DESSERT and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	1.86(1.16)	3.11(2.96)	
Below Set Point	2.73(1.10)	3.89 (.73)	$\bar{X}$ High Obese = 2.90

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	1.82 (.18)	2.07 (.33)	
Below Set Point	2.86(1.38)	1.96 (.90)	$\bar{X}$ Mod. Obese = 2.04

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	2.29(3.28)	1.75(1.01)	
Below Set Point	2.29 (.51)	2.11 (.73)	$\bar{X}$ Normal = 2.11

$\bar{X}$ At Set Point = 2.15 $\bar{X}$ Fast Clock = 2.21

$\bar{X}$ Below Set Point = 2.54 $\bar{X}$ Slow Clock = 2.48

Hartley's test = 18.07 (a=12, 6 df)

Analysis of Variance for Evaluative Ratings of DESSERT

Source	df	MS	F
Weight Group	2	6.38	5.37(p<.01)
Set Point Class.	1	3.27	2.76(p<.10)
Clock Speed	1	1.55	1.31
Weight Group X Set Point Class.	2	.98	<1
Weight Group X Clock Speed	2	4.79	4.03(p<.025)
Set Point Class. X Clock Speed	1	.05	<1
Weight Group X Set Point Class. X Clock Speed	2	.38	<1
Error	72	1.19	

cant ($p<.01$) Degree of Overweight effect, the Newman-Kuels procedure was again used. The results are summarized in Table A11. From these results it is apparent that the High Obesity Ss rated DESSERT significantly ($p<.05$) less positively than did either the Moderately Obese Ss or Normal Weight Ss. These findings seem contrary to intuition. On a common sense level, it would be predicted that High Obesity Ss would be more favorably disposed toward desserts than would either Moderately Obese or Normal Weight Ss. The High Obesity Ss rated DESSERT as slightly positive (2.90); the Moderately Obese Ss rated DESSERT as quite positive (2.04) and the Normal Ss rated DESSERT as quite positive also (2.11).

To determine which differences in means were responsible for the Degree of Overweight X Clock Speed interaction, the Newman-Kuels procedure for post hoc comparisons was again used. The results from these contrasts are summarized in Table A12. As can be seen, the High Obese Ss in the Slow Clock condition rated DESSERT significantly ($p<.05$) more negatively than any of the other groups. The High Obese Ss rated DESSERT between slightly and neutrally positive (3.5). The other groups rated DESSERT as quite positive (around 2.0). This significant interaction plus a review of the means presented in Table A11 help to explain further the finding reported above, i.e., that High Obese Ss rated DESSERT significantly less positively than either the Moderately Obese or Normal Weight Ss. It is likely that the relatively extreme negative response of the High Obese Slow Clock Ss was enough to lead to a significant Degree of Overweight effect by raising considerably the overall or main High Obesity mean evaluative

Table A11

Contrasts Among the Means of the Significant Degree of Overweight effect
(Evaluative ratings of the concept DESSERT)

$\overline{X}_{\text{Mod. Obese}} = 2.03571$ $\overline{X}_{\text{High Obese}} = 2.10714$ $\overline{X}_{\text{Normal}} = 2.89571$

Differences Between Means:

	$\overline{X}_{\text{Normal}}$	$\overline{X}_{\text{High Obese}}$
$\overline{X}_{\text{Moderate Obese}}$	.07143	.86000 ($p<.05$)
$\overline{X}_{\text{High Obese}}$		.78857 ($p<.05$)

Newman-Kuels criterion values:

Means 3 ordered steps apart = .7004
Means 2 ordered steps apart = .58298

Table A12

Contrasts Among the Means of the Significant Degree of Overweight X Clock Speed Interaction (Evaluative ratings of the concept DESSERT)

$\overline{X}_{A_3C_2} = 1.92857$	$\overline{X}_{A_2C_2} = 2.01786$	$\overline{X}_{A_2C_1} = 2.05357$
$\overline{X}_{A_3C_1} = 2.28571$	$\overline{X}_{A_1C_1} = 2.29143$	$\overline{X}_{A_1C_2} = 3.5000$

	$\overline{X}_{A_2C_2}$	$\overline{X}_{A_2C_1}$	$\overline{X}_{A_3C_1}$	$\overline{X}_{A_1C_1}$	$\overline{X}_{A_1C_2}$
$\overline{X}_{A_3C_2}$	.08929	.12500	.35714	.36286	1.57143*
$\overline{X}_{A_2C_2}$		.03571	.26785	.27357	1.48214*
$\overline{X}_{A_2C_1}$			.23214	.23786	1.44643*
$\overline{X}_{A_3C_1}$				.00572	1.21429*
$\overline{X}_{A_1C_1}$					1.20857*

* $p<.05$

Newman-Kuels critical values:

Means 6 steps apart = 1.21056
Means 5 steps apart = 1.15818
Means 4 steps apart = 1.10289
Means 3 steps apart = .9894
Means 2 steps apart = .82353

A_1 = High Obese
A_2 = Moderate Obese
A_3 = Normal
C_1 = Fast Clock
C_2 = Slow Clock

rating of DESSERT.

In order to investigate the interaction further, contrasts between the ratings in the Fast Clock and Slow Clock conditions were compared for each group. The difference between the evaluative rating of the concept DESSERT in the Slow Clock and in the Fast Clock condition by the High Obese Ss and the Moderately Obese Ss was not significant (F=4.56, 2 and 72 df), after adjusting the Error Rate EW using the Scheffe' test. A similar contrast for the Moderately Obese and Normal Weight Ss (F=.36; 2 and 72 df) was also not significant. The contrast for the High Obesity and Normal Weight Ss (F=7.22; 2 and 72 df) was significant (p<.05). The criterion value for the Scheffe' test was F=6.30. Thus the significant interaction arises out of the significant change in the simple effect of the clock manipulation over the High Obesity and Normal Weight groups.

Contrasts were also performed to determine if any one group was more sensitive to the clock manipulation as shown by a significantly greater rating differential between Fast Clock and Slow Clock conditions. No significant effects were found in comparing the High Obese and Moderately Obese (F=2.71, 2 and 72 df), the High Obese and Moderately Obese (F=2.14, 2 and 72 df), and, finally, the Moderately Obese and Normal Weight Ss (F=.30, 2 and 72 df).

In sum, the interaction was primarily a function of the large negative rating change from the Fast Clock to Slow Clock conditions for the High Obese Ss as compared to the small positive change for the Normal Weight Ss. The interaction is presented graphically in Figure A1.

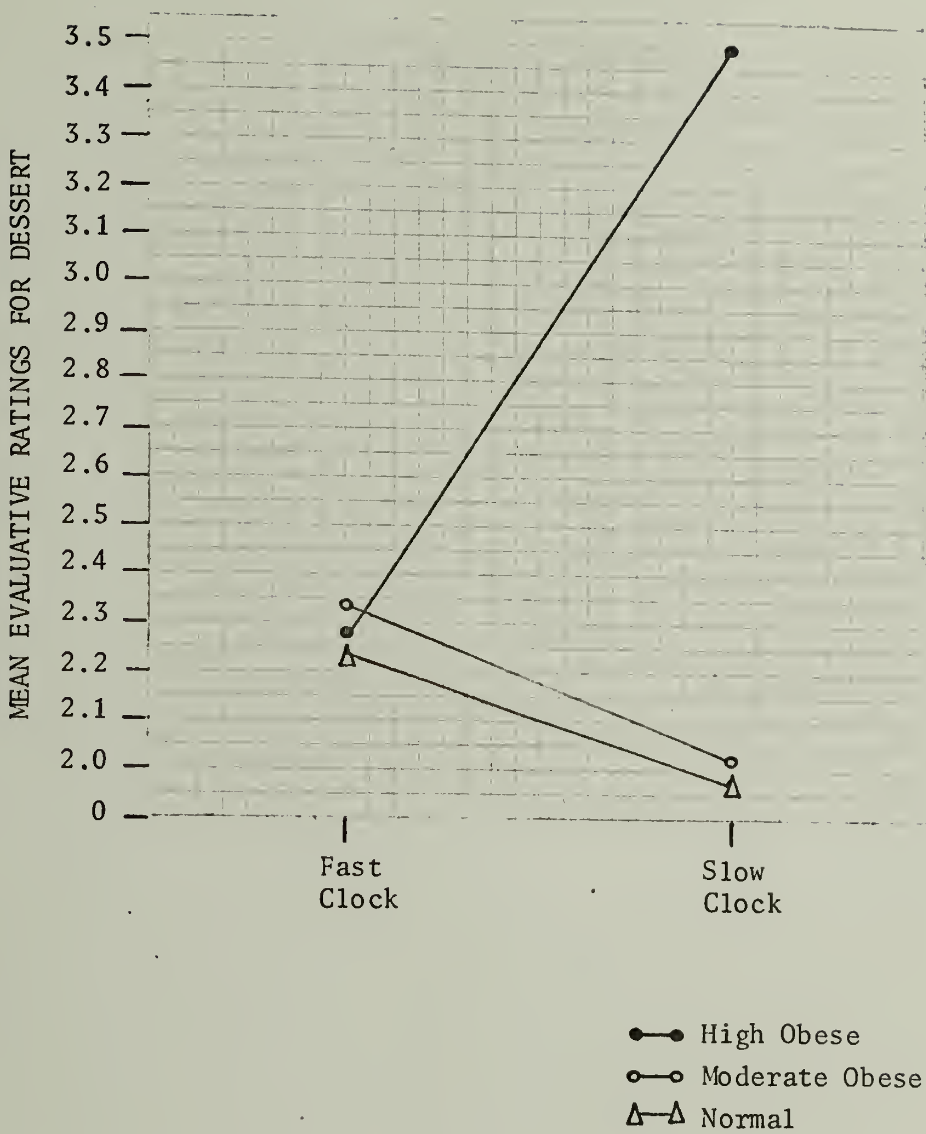

Fig. A1 - SIGNIFICANT DEGREE OF OVERWEIGHT X CLOCK SPEED INTERACTION FOR EVALUATIVE RATINGS OF DESSERT

The Set Point Classification effect approached statistical significance ($p<.10$). The Ss At Set Point rated DESSERT more positively than Ss Below Set Point-Diet. This seems reasonable on an intuitive level. Both ratings fell between quite positive and slightly positive (2.15 and 2.54).

(6.1-4.2) Potency Ratings

The mean potency ratings for DESSERT and their variances plus a summary of an ANOVA performed on the data are presented in Table A13. There were no significant effects. The mean overall potency rating was roughly neutral (4.23).

(6.1-4.3) Activity Ratings

The mean activity ratings for DESSERT and the variances plus a summary of an ANOVA performed on the data appear in Table A14. The reported results indicate that there was a significant ($p<.05$) Clock Speed effect. The Ss in the Fast Clock condition rated DESSERT as significantly ($p<.05$) more active than the Ss in the Slow Clock condition. Both ratings fell between neutral and slightly passive (4.15 and 4.50). The overall mean activity rating was also between neutral and slightly passive (4.33).

(6.1-5) The concept CALORIES

(6.1-5.1) Evaluative Ratings

The mean evaluative ratings of the concept CALORIES and their variances appear in Table A15. There was a significant Set Point

Table A13

Mean Potency Ratings for DESSERT and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	4.62(3.65)	4.52(2.59)	
Below Set Point	3.90 (.32)	4.68 (.55)	$\bar{X}$ High Obese = 4.43

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	4.95(2.24)	4.05(1.83)	
Below Set Point	3.85(1.85)	3.57 (.54)	$\bar{X}$ Mod. Obese = 4.11

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	4.28(2.50)	4.14(2.11)	
Below Set Point	4.12(1.80)	4.00(1.11)	$\bar{X}$ Normal = 4.13

$\bar{X}$ At Set Point = 4.43 $\bar{X}$ Fast Clock = 4.29

$\bar{X}$ Below Set Point = 4.02 $\bar{X}$ Slow Clock = 4.16

Hartley's test = 11.35 (a=12, 6 df)

Analysis of Variance for Potency Ratings for DESSERT

Source	df	MS	F
Weight Group	2	.92	<1
Set Point Class.	1	3.44	2.04
Clock Speed	1	.34	<1
Weight Group X Set Point Class.	2	.79	<1
Weight Group X Clock Speed	2	1.55	<1
Set Point Class. X Clock Speed	1	1.36	<1
Weight Group X Set Point Class. X Clock Speed	2	.34	<1
Error	72	1.69	

Table A14

Mean Activity Ratings for DESSERT and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	4.33(1.34)	4.38 (.24)	
Below Set Point	3.76 (.28)	4.38 (.50)	$\overline{X}$ High Obese = 4.21

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	4.52 (.33)	4.19 (.55)	
Below Set Point	4.04 (.57)	4.57 (.91)	$\overline{X}$ Mod. Obese = 4.33

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	3.90 (.95)	4.48 (.48)	
Below Set Point	4.33 (.22)	5.00 (.44)	$\overline{X}$ Normal = 4.43

$\overline{X}$ At Set Point = 4.30 $\overline{X}$ Fast Clock = 4.15

$\overline{X}$ Below Set Point = 4.35 $\overline{X}$ Slow Clock = 4.50

Hartley's test = 6.10 (a=12, 6 df)

Analysis of Variance for Activity Ratings for DESSERT

Source	df	MS	F
Weight Group	2	.32	<1
Set Point Class.	1	.05	<1
Clock Speed	1	2.57	4.52(p<.05)
Weight Group X Set Point Class.	2	1.06	<1
Weight Group X Clock Speed	2	.48	<1
Set Point Class. X Clock Speed	1	1.36	1.76
Weight Group X Set Point Class. X Clock Speed	2	.26	<1
Error	72	.57	

Table A15

Mean Evaluative Ratings for CALORIES and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	4.86(2.87)	4.57(2.41)	
Below Set Point	5.18(2.51)	5.36(1.73)	$\bar{X}$ High Obese = 4.99

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	4.64(2.41)	5.01(1.55)	
Below Set Point	6.14 (.66)	5.64(2.21)	$\bar{X}$ Mod. Obese = 5.36

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	4.46(1.24)	3.71(2.26)	
Below Set Point	5.14(1.39)	4.54(1.24)	$\bar{X}$ Normal = 4.46

$\bar{X}$ At Set Point = 4.54 $\bar{X}$ Fast Clock = 5.07
$\bar{X}$ Below Set Point = 5.33 $\bar{X}$ Slow Clock = 4.81

Hartley's test = 4.33 (a=12, 6 df)

Analysis of Variance for Evaluative Ratings of CALORIES

Source	df	MS	F
Weight Group	2	5.67	3.03(p<.10)
Set Point Class.	1	13.10	6.99(p<.025)
Clock Speed	1	1.49	<1
Weight Group X Set Point Class.	2	.47	<1
Weight Group X Clock Speed	2	.89	<1
Set Point Class. X Clock Speed	1	.04	<1
Weight Group X Set Point Class. X Clock Speed	2	.85	<1
Error	72	1.87	

Classification effect for the evaluative ratings of CALORIES. The Ss At Set Point rated CALORIES significantly ($p<.025$) more positively than the Ss Below Set Point-Diet. The At Set Point Ss rated CALORIES between neutral and slightly negative (4.54). The Below Set Point Ss rated CALORIES between slightly negative and quite negative (5.33).

This finding is intuitively reasonable and adds further to the construct validity of the Set Point Classifications. The Degree of Overweight variable approached statistical significance ($p<.10$). On the basis of the means it appears that the Normal Weight Ss were more positively inclined toward CALORIES than either of the other weight groups. Without contrasts among these means it is not possible to determine which differences were responsible for the effect and thus interpretations based on these means must be made with caution.

The mean overall evaluative rating of the concept CALORIES was slightly negative (4.94).

(6.1-5.2) Potency Ratings

The mean Potency Ratings for the concept CALORIES and a summary of an ANOVA performed on the data appear in Table A16. Two interaction effects were significant; the first was a Degree of Overweight X Clock Speed interaction; the second was a Set Point Classification X Clock Speed interaction. Newman-Kuels contrasts were performed for both interactions, and they are summarized in Tables A17 and A18. The interactions are presented graphically in Figures A2 and A3.

None of the Degree of Overweight X Clock Speed means were significantly different from any other. The contrasts among the differ-

Table A16

Mean Potency Ratings for CALORIES and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	4.47(3.03)	3.39(1.08)	
Below Set Point	4.38(4.38)	3.43(3.56)	$\overline{X}$ High Obese = 3.92

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	4.52(1.96)	4.23 (.80)	
Below Set Point	1.85 (.73)	4.57(1.51)	$\overline{X}$ Mod. Obese = 3.80

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	4.43(1.60)	2.76 (.73)	
Below Set Point	3.52(1.29)	3.38(1.79)	$\overline{X}$ Normal = 3.52

$\overline{X}$ At Set Point = 3.97 — $\overline{X}$ Fast Clock = 3.86

$\overline{X}$ Below Set Point = 3.52 — $\overline{X}$ Slow Clock = 3.63

Hartley's test = 6.06 (a=12, 6 df)

Analysis of Variance for Potency Ratings of CALORIES

Source	df	MS	F
Weight Group	2	1.15	<1
Set Point Class.	1	4.20	2.29
Clock Speed	1	1.17	<1
Weight Group X Set Point Class.	2	2.73	1.49
Weight Group X Clock Speed	2	11.06	6.03(p<.005)
Set Point Class. X Clock Speed	1	12.63	6.88(p<.005)
Weight Group X Set Point Class. X Clock Speed	2	3.62	1.97
Error	72	1.84	

Table A17

Contrasts Among the Means of the Significant Degree of Overweight X Clock Speed Interaction (Potency Ratings of the concept CALORIES)

$\bar{X}_{A_3C_2}$ = 3.06929	$\bar{X}_{A_2C_1}$ = 3.18786	$\bar{X}_{A_1C_2}$ = 3.40929
$\bar{X}_{A_3C_1}$ = 3.97429	$\bar{X}_{A_2C_2}$ = 4.40214	$\bar{X}_{A_1C_1}$ = 4.42643

Differences Among the Means:

	$\bar{X}_{A_2C_1}$	$\bar{X}_{A_1C_2}$	$\bar{X}_{A_3C_1}$	$\bar{X}_{A_2C_2}$	$\bar{X}_{A_1C_1}$
$\bar{X}_{A_3C_2}$	.11857	.34000	.28139	1.33285	1.35714
$\bar{X}_{A_2C_1}$		.22143	.78643	1.21428	1.23857
$\bar{X}_{A_1C_2}$			.568139	.99285	1.01714
$\bar{X}_{A_3C_1}$				.42785	.45214
$\bar{X}_{A_2C_2}$					.02429

Newman-Kuels critical values:

Means 6 ordered steps apart = 1.50384
Means 5 ordered steps apart = 1.43877
Means 4 ordered steps apart = 1.35201
Means 3 ordered steps apart = 1.2291
Means 2 ordered steps apart = 1.023945

A_1 = High Obese
A_2 = Moderate Obese
A_3 = Normal
C_1 = Fast Clock
C_2 = Slow Clock

Table A18

Contrasts Among the Means of the Significant Set Point Classification X Clock Speed Interaction (Potency Ratings of the concept CALORIES)

$\overline{X}_{B_2C_1}$ = 3.25143 $\overline{X}_{B_1C_2}$ = 3.46286 $\overline{X}_{B_2C_2}$ = 3.79095 $\overline{X}_{B_1C_1}$ = 4.47429

Differences Among the Means:

	$\overline{X}_{B_1C_2}$	$\overline{X}_{B_2C_2}$	$\overline{X}_{B_1C_1}$
$\overline{X}_{B_2C_1}$	.21143	.53952	1.22286 ($p<.05$)
$\overline{X}_{B_1C_2}$		.32809	1.01143 ($p<.05$)
$\overline{X}_{B_2C_2}$			.68334

Newman-Kuels critical values:

Means 4 ordered steps apart = 1.1033
Means 3 ordered steps apart = 1.003
Means 2 ordered steps apart = .83485

B_1 = At Set Point
B_2 = Below Set Point
C_1 = Fast Clock
C_2 = Slow Clock

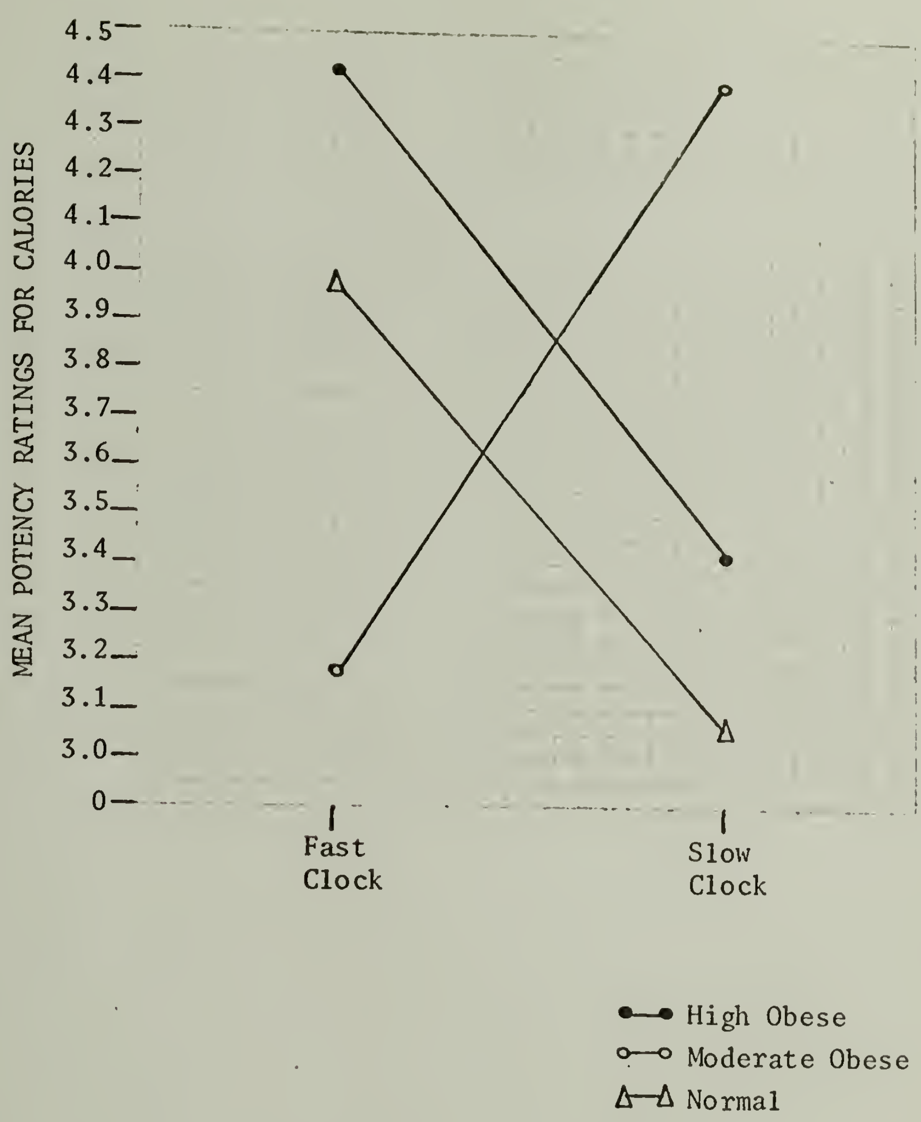

Fig. A2 - SIGNIFICANT DEGREE OF OVERWEIGHT X CLOCK SPEED INTERACTION FOR POTENCY RATINGS OF CALORIES

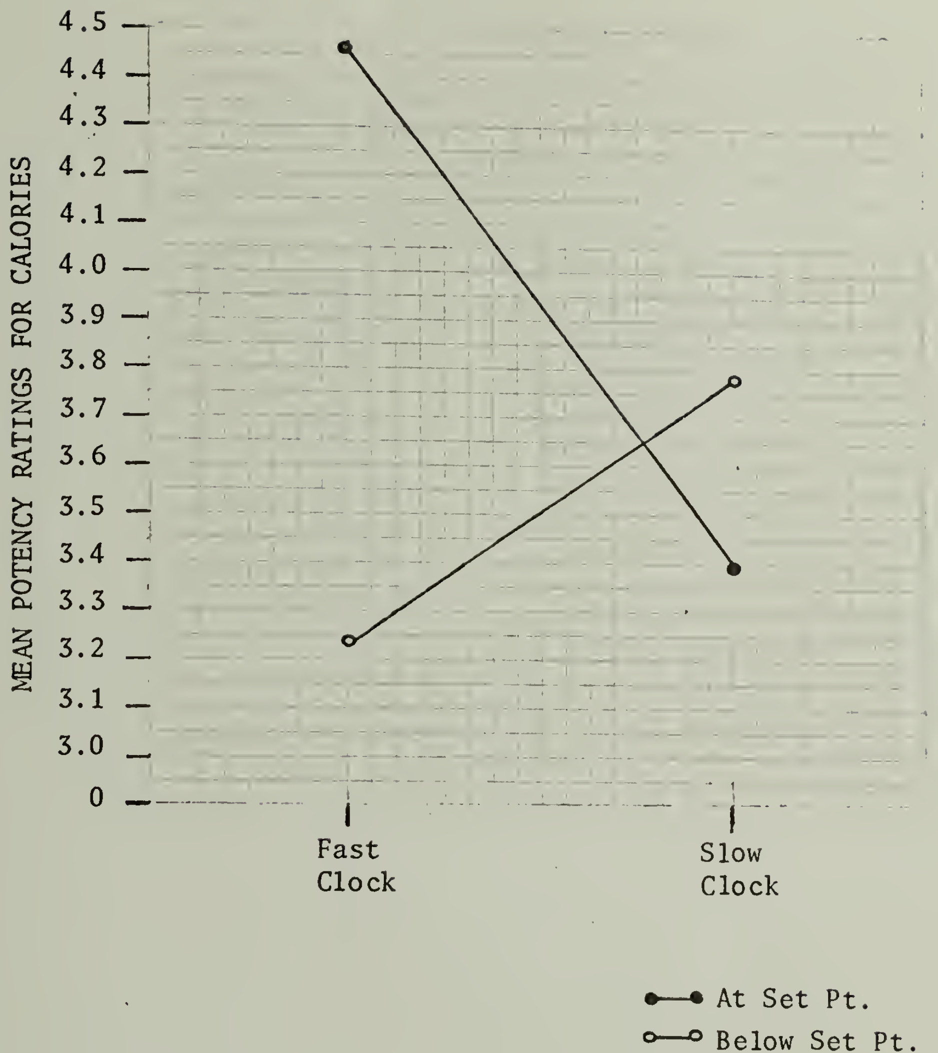

Fig. A3 - SIGNIFICANT SET POINT X CLOCK SPEED INTERACTION FOR POTENCY RATINGS OF CALORIES

ence between the mean ratings in the Fast Clock and Slow Clock conditions for the High Obese (1.02) and the Moderately Obese (-1.21) was significant (F=0.5, 2 and 72 df). A similar contrast for the Moderately Obese Ss (-1.21) and the Normal Weight Ss (.905) was also significant (F=8.57, 2 and 72 df). In sum the significant interaction effect was due primarily to the decrease in mean potency rating of CALORIES between the Fast Clock to Slow Clock conditions for the Moderately Obese Ss as compared to the decrease for the High Obese and Normal Weight Ss. Note that this interaction resembles closely the Degree of Overweight X Clock Speed interaction of the amount eaten data (see Section 3.2-1).

No significant differences were found in the absolute rating differences (Maximum F=.07 for Maximum contrast between High Obesity and Moderately Obese), indicating that no Weight group was significantly more sensitive to the clock manipulation than any other.

The results summarized in Table A16 indicate that the At Set Point Ss in the Fast Clock condition rated CALORIES as significantly less potent ($p<.05$) than did the At Set Point Ss in the Slow Clock condition or the Below Set Point-Diet Ss in the Fast Clock condition. The significant interaction effect is attributable to the decrease in potency rating for the Below Set Point-Diet Ss between the Fast Clock and Slow Clock conditions as compared to the increase for the At Set Ss (F=18.78, 2 and 72 df). Thus the Fast Clock condition led to significantly different Calories potency ratings for the At Set Point and Below Set Point-Diet Ss with the Slow Clock condition leading to approximately the same ratings for the two groups.

The overall potency rating for all groups was between slightly potent and neutral (3.75).

(6.1-5.3) Activity Ratings

No significant effects were found in the activity ratings of CALORIES. The relevant data appear in Table A19. The mean overall Activity rating was between slightly and neutrally active (3.49).

(6.1-6) The concept ME, AS I AM

This concept represents the S as she sees herself, or her "private self".

(6.1-6.1) Evaluative Ratings

The mean evaluative ratings and their variances for ME, AS I AM and a summary of an ANOVA performed on the data are presented in Table A20. These results indicate that there was a significant ($p<.01$) Clock Speed main effect. Ss in the Slow Clock condition rated their private selves more positively ($p<.01$) than Ss in the Fast Clock condition. The Fast Clock Ss rated their private selves between slightly positive and neutral (3.29). The Slow Clock Ss rated their private selves between quite positive and slightly positive (2.64).

(6.1-6.2) Potency Rating

The mean potency ratings for the concept ME, AS I AM and a summary of an ANOVA performed on this data appear in Table A21. There

Table A19

Mean Activity Ratings for CALORIES and their Variances
(Variances appear in parentheses)

High Obese	Fast Clock	Slow Clock	
At Set Point	3.90(1.17)	3.77 (.67)	
Below Set Point	3.90(2.43)	3.12(1.19)	$\bar{X}$ High Obese = 3.67

Moderate Obese	Fast Clock	Slow Clock	
At Set Point	3.14 (.81)	3.57 (.54)	
Below Set Point	3.00 (.70)	3.66(2.15)	$\bar{X}$ Mod. Obese = 3.34

Normal Weight	Fast Clock	Slow Clock	
At Set Point	3.71 (.72)	3.05 (.98)	
Below Set Point	3.57 (.88)	3.43 (.62)	$\bar{X}$ Normal = 3.44

$\bar{X}$ At Set Point = 3.52 — $\bar{X}$ Fast Clock = 3.54

$\bar{X}$ Below Set Point = 3.45 — $\bar{X}$ Slow Clock = 3.43

Hartley's test = 4.48 (a=12, 6 df)

Analysis of Variance for Activity Ratings for CALORIES

Source	df	MS	F
Weight Group	2	.81	<1
Set Point Class.	1	.13	<1
Clock Speed	1	.24	<1
Weight Group X Set Point Class.	2	.36	<1
Weight Group X Clock Speed	2	2.23	2.08
Set Point Class. X Clock Speed	1	.0069	<1
Weight Group X Set Point Class. X Clock Speed	2	.66	<1
Error	72	1.07	

Table A20

Mean Evaluative Ratings for ME, AS I AM, and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	3.96(3.26)	2.54(2.40)	
Below Set Point	3.65 (.57)	2.93 (.93)	$\bar{X}$ High Obese = 3.27

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	2.57 (.56)	2.48 (.53)	
Below Set Point	3.25 (.83)	2.79 (.65)	$\bar{X}$ Mod. Obese = 2.77

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	3.07(1.45)	2.43 (.37)	
Below Set Point	3.25(1.10)	2.71(1.40)	$\bar{X}$ Normal = 2.87

$\bar{X}$ At Set Point = 2.84 $\bar{X}$ Fast Clock = 3.29

$\bar{X}$ Below Set Point = 3.10 $\bar{X}$ Slow Clock = 2.64

Hartley's test = 8.83 (a=12, 6 df)

Analysis of Variance for Evaluative Ratings of ME, AS I AM

Source	df	MS	F
Weight Group	2	1.97	1.68
Set Point Class.	1	1.38	1.17
Clock Speed	1	8.84	7.54 ($p<.01$)
Weight Group X Set Point Class.	2	.36	<1
Weight Group X Clock Speed	2	1.13	<1
Set Point Class. X Clock Speed	1	.11	<1
Weight Group X Set Point Class. X Clock Speed	2	.50	<1
Error	72	1.17	

Table A21

Mean Potency Ratings for ME, AS I AM and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	2.33 (.74)	2.81(2.99)	
Below Set Point	2.66(2.04)	3.04 (.98)	$\bar{X}$ High Obese = 2.71

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	2.66 (.26)	3.19 (.22)	
Below Set Point	3.52(1.29)	3.52 (.29)	$\bar{X}$ Mod. Obese = 3.22

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	3.85(1.15)	4.28 (.35)	
Below Set Point	3.43 (.25)	3.90 (.80)	$\bar{X}$ Normal = 3.87

$\bar{X}$ At Set Point = 3.19 $\bar{X}$ Fast Clock = 3.08

$\bar{X}$ Below Set Point = 3.35 $\bar{X}$ Slow Clock = 3.45

Hartley's test = 13.88 (a=12, 6 df)

Analysis of Variance for Potency Ratings of ME, AS I AM

Source	df	MS	F
Weight Group	2	9.38	9.91(p<.001)
Set Point Class.	1	.53	<1
Clock Speed	1	3.03	3.21(p<.05)
Weight Group X Set Point Class.	2	1.83	1.94
Weight Group X Clock Speed	2	.08	<1
Set Point Class. X Clock Speed	1	.19	<1
Weight Group X Set Point Class. X Clock Speed	2	.16	<1
Error	72	.95	

was a significant main and a significant interaction effect. The Ss in the Fast Clock condition rated their private selves as significantly more potent ($p<.05$) than Ss in the Slow Clock condition. Both ratings fell between slightly potent and neutral (3.08 and 3.45).

There was a significant ($p<.001$) Degree of Overweight effect also. In order to determine which means were responsible for this effect, the Newman-Kuels procedure was used. The results appear in Table A22. The High Obesity Ss rated themselves as significantly more potent ($p<.05$) than did either the Moderately Obese or Normal Weight Ss. This is intuitively reasonable. Women weighing 45% over the average weight for their height would be expected to feel themselves more powerful simply because of their sheer mass. This adds further construct validity to the division of obese Ss into High Obese and Moderately Obese. The High Obese Ss rated their private selves between quite and slightly potent (2.71). The Moderately Obese rated their private selves between slightly potent and neutral (3.22) as did the Normal Weight Ss (3.87). The overall mean potency rating fell between slightly potent and neutral (3.27).

(6.1-6.3) Activity Rating

No significant effects were found for the activity rating of the concept ME, AS I AM. The relevant data appear in Table A23. The overall mean activity rating fell between slightly active and neutral (3.13).

Table A22

Contrasts Among the Means of the Significant Degree of Overweight Effect (Potency ratings of the concept ME, AS I AM)

$\overline{X}$ High Obese = 2.71143 $\overline{X}$ Mod. Obese = 3.22321 $\overline{X}$ Normal = 3.86607

Differences Among the Means:

	$\overline{X}$ Moderate Obese	$\overline{X}$ Normal
$\overline{X}$ High Obese	.51178	1.15464 ($p<.05$)
$\overline{X}$ Moderate Obese		.64286 ($p<.05$)

Newman-Kuels criterion values:

Means 3 ordered steps apart = .62560
Means 2 ordered steps apart = .52072

Table A23

Mean Activity Ratings of ME, AS I AM and their Variances
(Variances appear in parentheses)

High Obese	Fast Clock	Slow Clock	
At Set Point	3.52(2.96)	3.28(1.61)	
Below Set Point	3.16 (.32)	3.04 (.83)	$\bar{X}$ High Obese = 2.71

Moderate Obese	Fast Clock	Slow Clock	
At Set Point	2.47 (.22)	3.28 (.80)	
Below Set Point	3.14 (.40)	3.09 (.51)	$\bar{X}$ Mod. Obese = 3.00

Normal Weight	Fast Clock	Slow Clock	
At Set Point	3.24 (.89)	3.14 (.63)	
Below Set Point	3.38 (.72)	2.76 (.54)	$\bar{X}$ Normal = 3.13

$\bar{X}$ At Set Point = 3.16 $\bar{X}$ Fast Clock = 3.15

$\bar{X}$ Below Set Point = 3.10 $\bar{X}$ Slow Clock = 3.10

Hartley's test = 13.74 (a=12, 6 df)

Analysis of Variance for Activity Ratings of ME, AS I AM

Source	df	MS	F
Weight Group	2	.46	<1
Set Point Class.	1	.08	<1
Clock Speed	1	.06	<1
Weight Group X Set Point Class.	2	.53	<1
Weight Group X Clock Speed	2	1.03	1.19
Set Point Class. X Clock Speed	1	.93	1.07
Weight Group X Set Point Class. X Clock Speed	2	.43	<1
Error	72	.87	

(6.1-7) The concept ME, AS I WOULD LIKE TO BE

This concept serves as a measure of the Ss "ideal self".

(6.1-7.1) Evaluative Rating

The mean evaluative ratings for ME, AS I WOULD LIKE TO BE and a summary of an ANOVA performed on the data appear in Table A24. There were two significant main effects. The Clock Speed main effect indicated that the Ss in the Slow Clock condition rated their ideal selves as significantly more positive ($p<.05$) than did their Fast Clock counterparts. The Fast Clock Ss rated their ideal selves between quite positive and slightly positive (1.65), as did the Slow Clock Ss (1.40).

The other main effect was a Degree of Overweight effect. The Newman-Kuels procedure was used to find which means were significantly different. The results appear in Table A25. High Obesity Ss rated their ideal selves significantly more positively ($p<.05$) than did the Normal Weight Ss (but not significantly more than the Moderately Obese Ss). All groups rated their ideal selves between very positive and quite positive (1.28; 1.57; 1.73).

The significantly more positive ideal rating of the High Obese Ss may indicate some "overshoot" on their part. That is, they see the need for greater change from their private selves in order for them to be acceptable according to societal weight standards. This interpretation seems reasonable when it is remembered that their ratings of their private selves did not differ significantly from those of the Moderately Obese and Normal Weight groups.

Table A24

Mean Evaluative Ratings for ME, AS I WOULD LIKE TO BE
and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	1.29 (.13)	1.36 (.46)	
Below Set Point	1.29 (.24)	1.18 (.10)	$\bar{X}$ High Obese = 1.28

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	1.64 (.27)	1.32 (.16)	
Below Set Point	1.71 (.61)	1.61 (.52)	$\bar{X}$ Mod. Obese = 1.57

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	1.92(1.25)	1.43 (.31)	
Below Set Point	2.04 (.26)	1.54 (.18)	$\bar{X}$ Normal = 1.73

$\bar{X}$ At Set Point = 1.49 $\bar{X}$ Fast Clock = 1.65

$\bar{X}$ Below Set Point = 1.56 $\bar{X}$ Slow Clock = 1.40

Hartley's test = 12.72 (a=12, 6 df)

Analysis of Variance for Evaluative Ratings of
ME, AS I WOULD LIKE TO BE

Source	df	MS	F
Weight Group	2	1.48	3.96(p<.025)
Set Point Class.	1	.10	<1
Clock Speed	1	1.23	3.30(p<.05)
Weight Group X Set Point Class.	2	.14	<1
Weight Group X Clock Speed	2	.40	<1
Set Point Class. X Clock Speed	1	.0003	<1
Weight Group X Set Point Class. X Clock Speed	2	.07	<1
Error	72	.37	

Table A25

Contrasts Among the Means of the Significant Degree of Overweight effect
(Evaluative Rating of the concept ME, AS I WOULD LIKE TO BE)

$\overline{X}$ High Obese = 1.27679 $\overline{X}$ Mod. Obese = 1.57143 $\overline{X}$ Normal = 1.7929

Differences Among the Means:

	$\overline{X}$ Moderate Obese	$\overline{X}$ Normal
$\overline{X}$ High Obese	.29464	.51611 ($p<.05$)
$\overline{X}$ Moderate Obese		.22147

Newman-Kuels critical values:

Means 3 ordered steps apart = .39236
Means 2 ordered steps apart = .32658

The mean overall evaluative rating of ME, AS I WOULD LIKE TO BE was between very positive and quite positive (1.53).

(6.1-7.2) Potency Rating

No significant effects were found for the potency ratings of ME, AS I WOULD LIKE TO BE. The relevant data appear in Table A26. The overall potency rating of the ideal self fell between neutral and slightly impotent (4.79).

(6.1-7.3) Activity Rating

The mean activity ratings for the concept ME, AS I WOULD LIKE TO BE are in Table A27. The value for Hartley's test was 25.33 (a=12, 6 df). This value is significant ($p<.05$); however, an ANOVA was performed on the data. This analysis is summarized in Table A27. There was a significant ($p<.05$) Degree of Overweight X Clock Speed X Set Point Classification interaction. The Newman-Kuels post hoc comparison procedure was used to determine which means were significantly different. The results are summarized in Table A28. Only the maximum possible contrast was significant ($p<.05$). This particular contrast has little theoretical significance by itself. The interaction effect is presented graphically in Figure A4. From visual inspection of Figure A4 and the results of the Newman-Kuels comparisons, it is apparent that the interaction is due primarily to the large decrease in the activity rating for the Moderately Obese Below Set Point and the High Obese At Set Point groups as compared to the slight increases for the other groups.

Table A26

Mean Potency Ratings for ME, AS I WOULD LIKE TO BE and their Variances (Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	4.71 (.69)	5.19 (.63)	
Below Set Point	4.76 (.21)	5.05 (.02)	$\bar{X}$ High Obese = 4.93

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	4.86 (.29)	4.28 (.42)	
Below Set Point	4.85 (.48)	4.52(1.00)	$\bar{X}$ Mod. Obese = 4.63

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	4.71 (.61)	4.81 (.40)	
Below Set Point	4.71 (.83)	4.95 (.09)	$\bar{X}$ Normal = 4.80

$\bar{X}$ At Set Point = 4.76 $\bar{X}$ Fast Clock = 4.77

$\bar{X}$ Below Set Point = 4.81 $\bar{X}$ Slow Clock = 4.80

Hartley's test = 63.97 (a=12, 6 df)

Analysis of Variance for the Potency Ratings of ME, AS I WOULD LIKE TO BE

Source	df	MS	F
Weight Group	2	.63	2.12
Set Point Class.	1	.05	<1
Clock Speed	1	.02	<1
Weight Group X Set Point Class.	2	.05	<1
Weight Group X Clock Speed	2	1.32	2.79
Set Point Class. X Clock Speed	1	.02	<1
Weight Group X Set Point Class. X Clock Speed	2	.09	<1
Error	72	.47	

Table A27

Mean Activity Ratings for ME, AS I WOULD LIKE TO BE and their Variances (Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	1.76 (.18)	2.05 (.68)	
Below Set Point	2.62 (.24)	2.28 (.86)	$\overline{X}$ High Obese = 2.18

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	2.38 (.38)	2.09 (.10)	
Below Set Point	1.90 (.65)	3.82(2.53)	$\overline{X}$ Mod. Obese = 2.41

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	2.38 (.68)	2.33 (.60)	
Below Set Point	2.33 (.59)	2.23 (.43)	$\overline{X}$ Normal = 2.32

$\overline{X}$ At Set Point = 2.16 $\overline{X}$ Fast Clock = 2.23

$\overline{X}$ Below Set Point = 2.33 $\overline{X}$ Slow Clock = 2.38

Hartley's test = 25.33 (a=12, 6 df)

Analysis of Variance for Activity Ratings of ME, AS I WOULD LIKE TO BE

Source	df	MS	F
Weight Group	2	.40	<1
Set Point Class.	1	1.61	2.44
Clock Speed	1	.48	<1
Weight Group X Set Point Class.	2	.70	1.06
Weight Group X Clock Speed	2	.83	1.26
Set Point Class. X Clock Speed	1	.58	<1
Weight Group X Set Point Class. X Clock Speed	2	2.48	3.75(p<.05)
Error	72	.66	

Table A28

Contrasts Among the Means of the Degree of Overweight X Set Point Classification X Clock Speed interaction
(Activity ratings of the concept ME, AS I WOULD LIKE TO BE)

$\overline{X}_{A_1B_1C_1}$ = 1.76143	$\overline{X}_{A_2B_2C_1}$ = 1.90286	$\overline{X}_{A_1B_1C_2}$ = 2.04571
$\overline{X}_{A_2B_1C_2}$ = 2.09286	$\overline{X}_{A_3B_2C_2}$ = 2.23286	$\overline{X}_{A_1B_2C_2}$ = 2.28286
$\overline{X}_{A_3B_2C_1}$ = 2.33143	$\overline{X}_{A_3B_1C_2}$ = 2.33143	$\overline{X}_{A_3B_1C_1}$ = 2.37571
$\overline{X}_{A_2B_1C_1}$ = 2.37857	$\overline{X}_{A_1B_2C_1}$ = 2.61571	$\overline{X}_{A_2B_2C_2}$ = 3.28286

Newman-Kuels Critical Values:

Means 12 ordered steps apart = 1.47667
Means 11 ordered steps apart = 1.45211
Means 10 ordered steps apart = 1.42755
Means 9 ordered steps apart = 1.39685
Means 8 ordered steps apart = 1.36308
Means 7 ordered steps apart = 1.32317
Means 6 ordered steps apart = 1.27712
Means 5 ordered steps apart = 1.22186
Means 4 ordered steps apart = 1.14818
Means 3 ordered steps apart = 1.0438
Means 2 ordered steps apart = .86887

A_1 = High Obese
A_2 = Moderate Obese
A_3 = Normal
B_1 = At Set Point
B_2 = Below Set Point
C_1 = Fast Clock
C_2 = Slow Clock

Differences Among Means: *(p<.05)

	$\overline{X}_{A_2B_2C_1}$	$\overline{X}_{A_1B_1C_2}$	$\overline{X}_{A_2B_1C_2}$	$\overline{X}_{A_3B_2C_2}$	$\overline{X}_{A_1B_2C_2}$	$\overline{X}_{A_3B_2C_1}$	$\overline{X}_{A_3B_1C_2}$	$\overline{X}_{A_3B_1C_1}$	$\overline{X}_{A_2B_1C_1}$	$\overline{X}_{A_1B_2C_1}$	$\overline{X}_{A_2B_2C_2}$
$\overline{X}_{A_1B_1C_1}$	.14143	.28428	.33143	.47143	.52143	.57000	.57000	.61428	.61714	.85428	1.52143*
$\overline{X}_{A_2B_2C_1}$		.14285	.19000	.33000	.38000	.42857	.42857	.47285	.47571	.71285	1.38000
$\overline{X}_{A_1B_1C_2}$			.04715	.18715	.23715	.28572	.28572	.33000	.33286	.57000	1.23715
$\overline{X}_{A_2B_1C_2}$				.14000	.19000	.23857	.23857	.28285	.28571	.52285	1.19000
$\overline{X}_{A_3B_2C_2}$					.05000	.09857	.09857	.14285	.14571	.38285	1.05000
$\overline{X}_{A_1B_2C_2}$						.04857	.04857	.09285	.09571	.33285	1.00000
$\overline{X}_{A_3B_2C_1}$							.00000	.04428	.04714	.28428	.95143
$\overline{X}_{A_3B_1C_2}$								.04428	.04714	.28428	.95143
$\overline{X}_{A_3B_1C_1}$									.00286	.24000	.90715
$\overline{X}_{A_2B_1C_1}$										.23714	.90429
$\overline{X}_{A_1B_2C_1}$											.66715

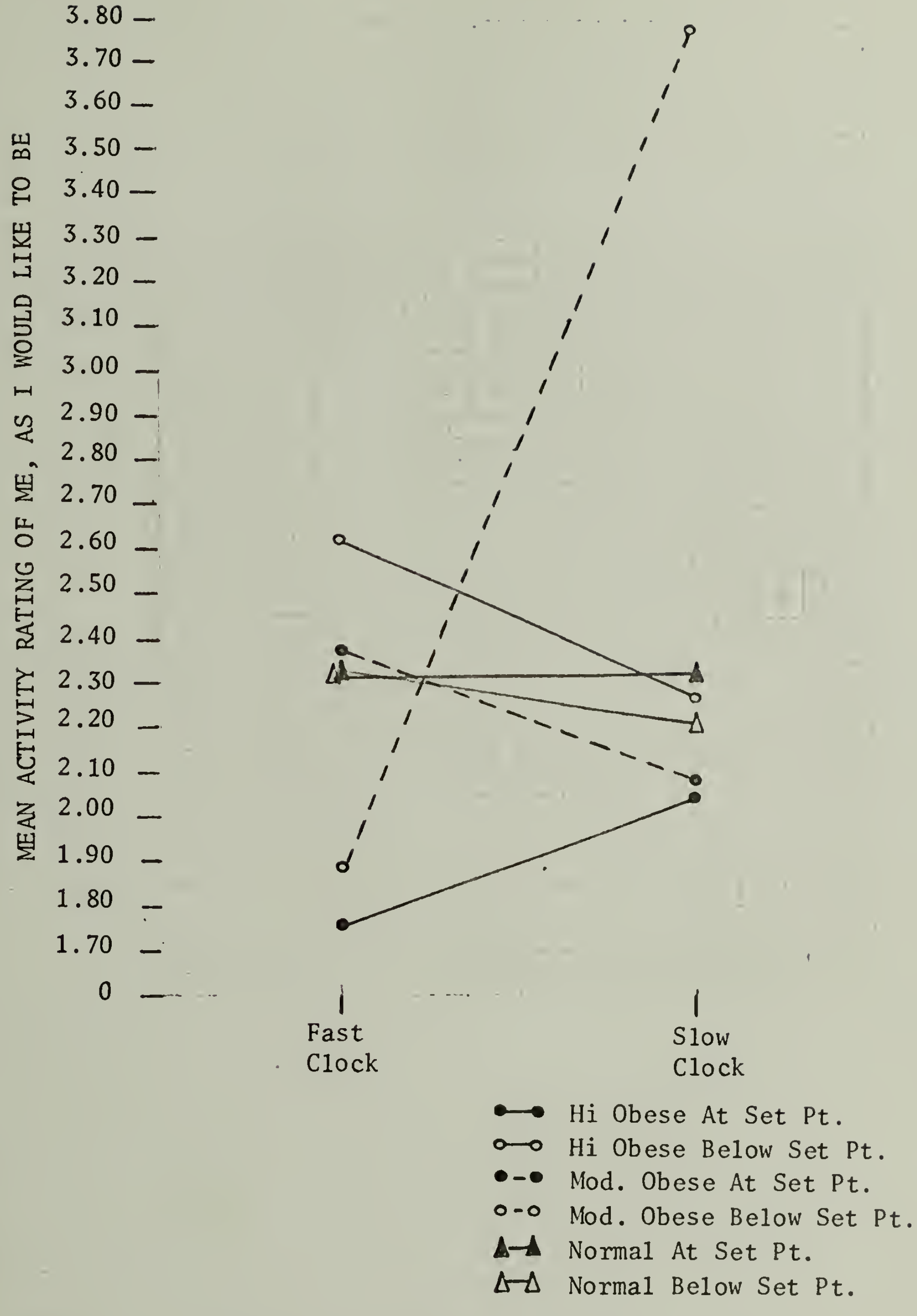

Fig. A4 - SIGNIFICANT DEGREE OF OVERWEIGHT X SET POINT CLASS X CLOCK SPEED INTERACTION FOR ACTIVITY RATING OF ME AS I WOULD LIKE TO BE

The overall mean activity rating fell between quite and slightly active (2.31).

(6.1-8) The concept ME, AS OTHERS SEE ME

This concept is used to measure the Ss' perception of their "public selves".

(6.1-8.1) Evaluative Rating

The mean evaluative ratings for the concept ME, AS OTHERS SEE ME and an ANOVA performed on this data appear in Table A29.

As can be seen, the Set Point Classification effect approached statistical significance ($p<.10$). At a somewhat uncomfortable level of significance, this indicates that Ss At Set Point perceive their public selves as more positive than those Below Set Point-Diet. The mean evaluative rating for the At Set Point Ss was between quite positive and slightly positive (2.71). The mean evaluative rating for the Below Set Point Ss was between slightly positive and neutral (3.11). The overall evaluative rating was between quite positive and slightly positive (2.91).

(6.1-8.2) Potency Rating

The mean potency ratings for the concept ME, AS OTHERS SEE ME, and the summary of an ANOVA performed on the data appears in Table A30. There was a significant ($p<.001$) Degree of Overweight effect. The Newman-Kuels contrasts were used to compare the means. The results appear in Table A31. The High Obese and Moderately Obese Ss

Table A29

Mean Evaluative Ratings for ME, AS OTHERS SEE ME and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	2.68 (.76)	2.55(2.91)	
Below Set Point	3.39 (.84)	2.57 (.58)	$\bar{X}$ High Obese = 2.80

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	2.82 (.37)	2.57 (.41)	
Below Set Point	2.68 (.87)	3.43(1.70)	$\bar{X}$ Mod. Obese = 2.88

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	3.23(1.11)	2.39 (.54)	
Below Set Point	3.36(1.27)	3.21(1.40)	$\bar{X}$ Normal = 3.05

$\bar{X}$ At Set Point = 2.71 $\bar{X}$ Fast Clock = 3.03

$\bar{X}$ Below Set Point = 3.11 $\bar{X}$ Slow Clock = 2.79

Hartley's test = 7.89 (a=12, 6 df)

Analysis of Variance for Evaluative Ratings of ME, AS OTHERS SEE ME

Source	df	MS	F
Weight Group	2	.46	<1
Set Point Class.	1	3.38	3.18
Clock Speed	1	1.19	1.12
Weight Group X Set Point Class.	2	.03	<1
Weight Group X Clock Speed	2	1.25	1.18
Set Point Class. X Clock Speed	1	.58	<1
Weight Group X Set Point Class. X Clock Speed	2	1.42	1.34
Error	72	1.06	

Table A30

Mean Potency Ratings for ME, AS OTHERS SEE ME, and their Variances
(Variances appear in parentheses)

High Obese	Fast Clock	Slow Clock	
At Set Point	2.14(1.40)	2.62(1.76)	
Below Set Point	3.05(2.98)	3.14 (.99)	$\bar{X}$ High Obese = 2.74
Moderate Obese	**Fast Clock**	**Slow Clock**	
At Set Point	2.95 (.61)	3.19 (.55)	
Below Set Point	3.00 (.63)	2.95 (.72)	$\bar{X}$ Mod. Obese = 3.02
Normal Weight	**Fast Clock**	**Slow Clock**	
At Set Point	4.33(1.26)	4.86(2.14)	
Below Set Point	3.81 (.70)	4.28 (.46)	$\bar{X}$ Normal = 4.32

$\bar{X}$ At Set Point = 3.35 $\bar{X}$ Fast Clock = 3.21

$\bar{X}$ Below Set Point = 3.37 $\bar{X}$ Slow Clock = 3.51

Hartley's test = 6.52 (a=12, 6 df)

Analysis of Variance for Potency Ratings of ME, AS OTHERS SEE ME

Source	df	MS	F
Weight Group	2	19.95	16.86(p<.001)
Set Point Class.	1	.01	<1
Clock Speed	1	1.81	1.53
Weight Group X Set Point Class.	2	2.86	2.42(p<.10)
Weight Group X Clock Speed	2	.29	<1
Set Point Class. X Clock Speed	1	.30	<1
Weight Group X Set Point Class. X Clock Speed	2	.05	<1
Error	72	1.18	

Table A31

Contrasts Among the Means of the Significant Degree of Overweight Effect
(Potency ratings of the concept ME, AS OTHERS SEE ME)

$\overline{X}$ High Obese = 2.73500 $\overline{X}$ Mod. Obese = 3.02107 $\overline{X}$ Normal = 4.31893

Differences Among the Means:

	$\overline{X}$ Moderate Obese	$\overline{X}$ Normal
$\overline{X}$ High Obese	.28607	1.58393 ($p<.05$)
$\overline{X}$ Moderate Obese		1.29786 ($p<.05$)

Newman-Kuels criterion values:

Means 3 ordered steps apart = .69700
Means 2 ordered steps apart = .58015

rated their public selves as significantly ($p<.05$) more potent than did the Normal Weight Ss. This is intuitively reasonable if potency is translated into physical power or size. Again, this finding adds some construct validity to the three weight groups. The mean potency rating by the High Obese Ss was between quite potent and slightly potent (2.74). The mean rating by the Moderately Obese Ss was slightly positive (3.02). The Normal Weight Ss' mean potency rating was between neutral and slightly impotent (4.32). The grand potency mean rating was between slightly potent and neutral (3.36).

(6.1-8.3) Activity Rating

There were no significant effect in the activity ratings of ME, AS OTHERS SEE ME. The relevant data appear in Table A32. The overall mean activity rating fell between slightly active and neutral (3.26).

(6.2) Control Groups' Semantic Differential Ratings

The same format will be used for analysis of the Semantic Differential Ratings for the Control Groups as was used for the ratings from the Main part of this study. The relevant data for the Control groups appear in Tables A33 through A58.

As can be seen from Table A41, there was a significant Set Point Classification Effect for the activity ratings of OBESITY. There was, however, significant ($p<.01$) heterogeneity of variance according to Hartley's test (28.45, a=6, 6 df). An ANOVA performed on the data is also summarized in Table A41. In order to find which means were

Table A32

Mean Activity Ratings of ME, AS OTHERS SEE ME and their Variances
(Variances appear in parentheses)

High Obese

	Fast Clock	Slow Clock	
At Set Point	2.81 (.77)	3.33(1.26)	
Below Set Point	4.09(1.51)	3.33(1.82)	$\bar{X}$ High Obese = 3.39

Moderate Obese

	Fast Clock	Slow Clock	
At Set Point	2.71 (.16)	3.28 (.53)	
Below Set Point	3.04 (.49)	3.24 (.47)	$\bar{X}$ Mod. Obese = 3.07

Normal Weight

	Fast Clock	Slow Clock	
At Set Point	3.52(1.14)	3.42 (.51)	
Below Set Point	3.04 (.53)	3.28 (.79)	$\bar{X}$ Normal = 3.32

$\bar{X}$ At Set Point = 3.18 $\bar{X}$ Fast Clock = 3.20

$\bar{X}$ Below Set Point = 3.34 $\bar{X}$ Slow Clock = 3.14

Hartley's test = 11.03 (a=12, 6 df)

Analysis of Variance for Activity Ratings of ME, AS OTHERS SEE ME

Source	df	MS	F
Weight Group	2	.80	<1
Set Point Class.	1	.53	<1
Clock Speed	1	.26	<1
Weight Group X Set Point Class.	2	1.59	1.92
Weight Group X Clock Speed	2	.45	<1
Set Point Class. X Clock Speed	1	1.04	1.25
Weight Group X Set Point Class. X Clock Speed	2	1.16	1.40
Error	72	.83	

responsible for this effect, Newman-Kuels contrasts were performed. The results are summarized in Table A42. The Normal Weight Below Set Point-Diet Ss rated OBESITY as significantly more ($p<.05$) active than either the Normal Weight At Set Point and Normal Weight Below Set Point-No Diet Ss. The mean rating by the Moderately Obese was between neutral and slightly inactive (4.35). The mean ratings for the Normal At Set Point and Normal Below Set Point-No Diet groups were between slightly inactive and quite inactive (5.24 and 5.43).

Table A46 reveals a significant Set Point Classification Effect for the evaluative ratings of CALORIES. In order to determine which means were responsible for this effect, Newman-Kuels post hoc contrasts were again performed. The results are summarized in Table A47. The Normal Weight Below Set Point-No Diet group rated CALORIES significantly ($p<.05$) less positively than did the Normal Weight At Set Point and the Normal Weight Below Set Point-Diet group. The mean rating by the Normal Weight Below Set Point-No Diet group was between slightly negative and quite negative (5.30). The other two groups had mean ratings between neutral and slightly negative (4.09 and 4.84).

Table A47 contains another significant effect. Here the Ss in the Fast Clock condition rated CALORIES as significantly ($p<.025$) less potent than the Ss in the Slow Clock condition. The At Set Point Ss had a mean rating between neutral and slightly impotent (4.18). The Fast Clock Ss had a mean rating between slightly potent and neutral (3.22).

These were the only effects found to be significant in the

Control groups.

(6.2-1) <u>Mean Overall Ratings in the Control Groups</u>

Diet -

Evaluative - between slightly positive and neutral (3.77)

Potency - between neutral and slightly impotent (4.54)

Activity - between slightly active and neutral (3.78)

Food -

Evaluative - between quite positive and slightly positive (2.19)

Potency - between slightly potent and neutral (3.72)

Activity - between slightly active and neutral (3.54)

Obesity -

Evaluative - between quite negative and very negative (6.32)

Potency - between quite negative and slightly negative (2.83)

Activity - slightly active (5.01)

Dessert -

Evaluative - between quite positive and slightly positive (2.44)

Potency - between neutral and slightly impotent (4.26)

Activity - between neutral and slightly inactive (4.44)

Calories -

Evaluative - between neutral and slightly negative (4.75)

Potency - between slightly potent and neutral (3.7)

Activity - between slightly active and neutral (3.53)

Me, as I am -

Evaluative - between quite positive and slightly positive (2.88)

Potency - between slightly potent and neutral (3.86)

Table A33

Mean Evaluative Ratings for DIET (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.68(1.43)	3.75(3.04)	$\overline{X}$ = 3.71
Norm Below Set Pt. Diet	3.68(2.04)	3.79(1.53)	$\overline{X}$ = 3.73
Norm Below Set Pt. No Diet	3.57(1.92)	4.18(1.62)	$\overline{X}$ = 3.89
	$\overline{X}$ = 3.64	$\overline{X}$ = 3.90	

Hartley's test = 2.02 (a=6, 6 df)

Analysis of Variance for Evaluative Ratings of DIET (Control Groups)

Source	df	MS	F
Set Point Class.	2	.11	<1
Clock Speed	1	.73	<1
Set Point Class. X Clock Speed	2	.31	<1
Error	36	1.94	

Activity - between slightly active and neutral (3.24)

Me, as others see me -

Evaluative - slightly positive (2.99)

Potency - between neutral and slightly impotent (4.29)

Activity - between slightly active and neutral (3.35)

Me, as I would like to be -

Evaluative - between very positive and slightly positive (1.68)

Potency - between neutral and slightly impotent (4.86)

Activity - between quite active and slightly active (2.38)

Table A33

Mean Evaluative Ratings for DIET (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.68(1.43)	3.75(3.04)	$\overline{X}$ = 3.71
Norm Below Set Pt. Diet	3.68(2.04)	3.79(1.53)	$\overline{X}$ = 3.73
Norm Below Set Pt. No Diet	3.57(1.92)	4.18(1.62)	$\overline{X}$ = 3.89
	$\overline{X}$ = 3.64	$\overline{X}$ = 3.90	

Hartley's test = 2.02 (a=6, 6 df)

Analysis of Variance for Evaluative Ratings of DIET (Control Groups)

Source	df	MS	F
Set Point Class.	2	.11	<1
Clock Speed	1	.73	<1
Set Point Class. X Clock Speed	2	.31	<1
Error	36	1.94	

Table A35

Mean Activity Ratings for DIET (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.52 (.55)	4.04 (.13)	$\bar{X}$ = 3.78
Norm Below Set Pt. Diet	3.57 (.51)	3.52 (.44)	$\bar{X}$ = 3.55
Norm Below Set Pt. No Diet	4.09(2.25)	3.95 (.65)	$\bar{X}$ = 4.02
	$\bar{X}$ = 3.73	$\bar{X}$ = 3.83	

Hartley's test = 17.70 (a=6, 6 df) p<.05

Analysis of Variance for Activity Ratings of DIET (Control Groups)

Source	df	MS	F
Set Point Class.	2	.79	1.05
Clock Speed	1	.13	<1
Set Point Class. X Clock Speed	2	.46	<1
Error	36	.75	

Table A36

Mean Evaluative Ratings for FOOD (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	1.71 (.34)	1.96 (.43)	$\bar{X}$ = 1.84
Norm Below Set Pt. Diet	2.37 (.83)	2.11 (.60)	$\bar{X}$ = 2.24
Norm Below Set Pt. No Diet	2.61(1.54)	2.36 (.33)	$\bar{X}$ = 2.48
	$\bar{X}$ = 2.23	$\bar{X}$ = 2.14	

Hartley's test = 4.66 (a=6, 6 df)

Analysis of Variance for Evaluative Ratings of FOOD (Control Groups)

Source	df	MS	F
Set Point Class.	2	1.42	2.17
Clock Speed	1	.08	<1
Set Point Class. X Clock Speed	2	.30	<1
Error	36	.68	

Table A37

Mean Potency Ratings for FOOD (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.47 (.26)	4.19 (.55)	$\overline{X}$ = 3.83
Norm Below Set Pt. Diet	3.66(2.03)	3.43 (.14)	$\overline{X}$ = 3.54
Norm Below Set Pt. No Diet	3.90	3.66	$\overline{X}$ = 3.78
	$\overline{X}$ = 3.68	$\overline{X}$ = 3.76	

Hartley's test = 1.22 (a=6, 6 df)

Analysis of Variance for Potency Ratings of FOOD (Control Groups)

Source	df	MS	F
Set Point Class.	2	.33	1
Clock Speed	1	.07	1
Set Point Class. X Clock Speed	2	1.06	1.40
Error	36	.75	

Table A38

Mean Activity Ratings for FOOD (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.57 (.93)	3.19 (.22)	$\overline{X}$ = 3.38
Norm Below Set Pt. Diet	3.14 (.77)	3.33 (.96)	$\overline{X}$ = 3.24
Norm Below Set Pt. No Diet	4.33(1.93)	3.66 (.18)	$\overline{X}$ = 4.00
	$\overline{X}$ = 3.68	$\overline{X}$ = 3.39	

Hartley's test = 10.43 (a=6, 6 df)

Analysis of Variance for Activity RAtings of FOOD (Control Groups)

Source	df	MS	F
Set Point Class.	2	2.29	2.74(p<.10)
Clock Speed	1	.86	<1
Set Point Class. X Clock Speed	2	.67	<1
Error	36	.84	

Table A39

Mean Evaluative Ratings for OBESITY (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	6.11 (.60)	6.11 (.52)	$\bar{X}$ = 6.11
Norm Below Set Pt. Diet	6.39 (.16)	6.39 (.41)	$\bar{X}$ = 6.39
Norm Below Set Pt. No Diet	6.52(1.21)	6.39 (.48)	$\bar{X}$ = 6.46
	$\bar{X}$ = 6.34	$\bar{X}$ = 6.30	

Hartley's test = 7.36 (a=6, 6 df)

Analysis of Variance for Evaluative Ratings of OBESITY (Control Groups)

Source	df	MS	F
Set Point Class.	2	.49	<1
Clock Speed	1	.02	<1
Set Point Class. X Clock Speed	2	.02	<1
Error	36	.56	

Table A40

Mean Potency Ratings for OBESITY (Control Groups) and their Variances (Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.19(3.36)	2.81 (.81)	$\overline{X}$ = 3.00
Norm Below Set Pt. Diet	2.92(1.62)	2.50 (.79)	$\overline{X}$ = 2.71
Norm Below Set Pt. No Diet	3.33 (.73)	2.24 (.73)	$\overline{X}$ = 2.78
	$\overline{X}$ = 3.15	$\overline{X}$ = 2.51	

Hartley's test = 4.61 (a=6, 6 df)

Analysis of Variance for Potency Ratings of OBESITY (Control Groups)

Source	df	MS	F
Set Point Class.	2	.32	<1
Clock Speed	1	4.19	2.34
Set Point Class. X Clock Speed	2	.57	<1
Error	36	1.79	

Table A41

Mean Activity Ratings for OBESITY (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	5.14 (.11)	5.33 (.74)	$\overline{X}$ = 5.24
Norm Below Set Pt. Diet	4.24(1.51)	4.47(3.00)	$\overline{X}$ = 4.26
Norm Below Set Pt. No Diet	5.52 (.74)	5.33 (.30)	$\overline{X}$ = 5.43
	$\overline{X}$ = 4.97	$\overline{X}$ = 5.05	

Hartley's test = 28.45 (a=6, 6 df) p<.01

Analysis of Variance for Activity Ratings of OBESITY (Control Groups)

Source	df	MS	F
Set Point Class.	2	4.56	4.29(p<.025)
Clock Speed	1	.07	<1
Set Point Class. X Clock Speed	2	.19	<1
Error	36	1.06	

Table A42

Contrasts Among the Means of the Set Point Classification Effect
(Activity ratings for OBESITY - Control Groups)

$\overline{X}$ Below Set Point-Diet = 4.35571 $\overline{X}$ At Set Point = 5.23571

$\overline{X}$ Below Set Point-No Diet = 5.42571

Differences Among the Means:

	$\overline{X}$ Below Set Pt.-Diet	$\overline{X}$ Below Set Pt.-No Diet
$\overline{X}$ At Set Pt.	.88000 ($p<.05$)	1.07000 ($p<.05$)
$\overline{X}$ Below Set Pt.-No Diet		.19000

Newman-Kuels critical values:

Means 3 ordered steps apart = .93500
Means 2 ordered steps apart = .77825

Table A43

Mean Evaluative Ratings for DESSERT (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	2.29(3.28)	1.75(1.01)	$\overline{X}$ = 2.02
Norm Below Set Pt. Diet	2.29 (.51)	2.64 (.73)	$\overline{X}$ = 2.46
Norm Below Set Pt. No Diet	2.07(1.08)	3.61(1.02)	$\overline{X}$ = 2.84
	$\overline{X}$ = 2.21	$\overline{X}$ = 2.67	

Hartley's test = 6.44 (a=6, 6 df)

Analysis of Variance for Evaluative Ratings of DESSERT (Control Groups)

Source	df	MS	F
Set Point Class.	2	2.36	1.72
Clock Speed	1	2.14	1.56
Set Point Class. X Clock Speed	2	3.77	2.75($p<.10$)
Error	36	1.37	

Table A44

Mean Potency Ratings for DESSERT (Control Groups) and their Variances (Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	4.28(2.50)	4.14(2.11)	$\overline{X}$ = 4.21
Norm Below Set Pt. Diet	4.12(1.80)	4.00(1.11)	$\overline{X}$ = 4.06
Norm Below Set Pt. No Diet	4.90(2.29)	4.09(3.10)	$\overline{X}$ = 4.50
	$\overline{X}$ = 4.43	$\overline{X}$ = 4.08	

Hartley's test = 3.08 (a=6, 6 df)

Analysis of Variance for Potency Ratings of DESSERT (Control Groups)

Source	df	MS	F
Set Point Class.	2	.70	1
Clock Speed	1	1.35	1
Set Point Class. X Clock Speed	2	.54	1
Error	36	2.02	

Table A45

Mean Activity Ratings for DESSERT (Control Groups) and their Variances (Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.90 (.95)	4.48 (.48)	$\bar{X}$ = 4.19
Norm Below Set Pt. Diet	4.33 (.22)	5.00 (.44)	$\bar{X}$ = 4.67
Norm Below Set Pt. No Diet	4.76(1.83)	4.14 (.22)	$\bar{X}$ = 4.45
	$\bar{X}$ = 4.33	$\bar{X}$ = 4.54	

Hartley's test = 8.32 (a=6, 6 df)

Analysis of Variance for Activity Ratings of DESSERT (Control Groups)

Source	df	MS	F
Set Point Class.	2	.80	1.12
Clock Speed	1	.68	<1
Set Point Class. X Clock Speed	2	1.41	1.97
Error	36	.72	

Table A46

Mean Evaluative Ratings for CALORIES (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	4.46(1.24)	3.71(2.26)	$\overline{X}$ = 4.09
Norm Below Set Pt. Diet	5.14(1.39)	4.54(1.24)	$\overline{X}$ = 4.84
Norm Below Set Pt. No Diet	5.25(1.48)	5.36(1.89)	$\overline{X}$ = 5.30
	$\overline{X}$ = 4.95	$\overline{X}$ = 4.54	

Hartley's test = 1.82 (a=6, 6 df)

Analysis of Variance for Evaluative Ratings of CALORIES (Control Groups)

Source	df	MS	F
Set Point Class.	2	5.26	3.32($p<.05$)
Clock Speed	1	1.82	1.15
Set Point Class. X Clock Speed	2	.74	<1
Error	36	1.58	

Table A47

Contrasts Among the Means of the Set Point Classification Effect (Evaluative Ratings of CALORIES)

$\overline{X}$ At Set Point = 4.08929 $\overline{X}$ Below Set Point-Diet = 4.83929

$\overline{X}$ Below Set Point-No Diet = 5.30357

Differences Among the Means:

	$\overline{X}$ Below Set Pt.-Diet	$\overline{X}$ Below Set Pt.-No Diet
$\overline{X}$ At Set Pt.	.74000	1.21428 ($p<.05$)
$\overline{X}$ Below Set Pt.-Diet		.46428

Newman-Kuels critical values:

Means 3 ordered steps apart = 1.1424
Means 2 ordered steps apart = .95088

Table A48

Mean Potency Ratings for CALORIES (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	4.43(1.60)	2.76 (.73)	$\overline{X}$ = 3.59
Norm Below Set Pt. Diet	3.52(1.29)	3.38(1.79)	$\overline{X}$ = 3.45
Norm Below Set Pt. No Diet	4.59(1.99)	3.52(1.98)	$\overline{X}$ = 4.06
	$\overline{X}$ = 4.18	$\overline{X}$ = 3.22	

Hartley's test = 3.92 (a=6, 6 df)

Analysis of Variance for Potency Ratings of CALORIES (Control Groups)

Source	df	MS	F
Set Point Class.	2	1.42	<1
Clock Speed	1	9.69	6.55(p<.025)
Set Point Class. X Clock Speed	2	2.06	1.39
Error	36	1.48	

Table A49

Mean Activity Ratings of CALORIES (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.71 (.72)	3.05 (.98)	$\bar{X}$ = 3.38
Norm Below Set Pt. Diet	3.57 (.88)	3.43 (.62)	$\bar{X}$ = 3.50
Norm Below Set Pt. No Diet	3.62(1.29)	3.81(2.35)	$\bar{X}$ = 3.71
	$\bar{X}$ = 3.63	$\bar{X}$ = 3.43	

Hartley's test = 3.80 (a=6, 6 df)

Analysis of Variance for Activity Ratings of CALORIES (Control Groups)

Source	df	MS	F
Set Point Class.	2	.40	<1
Clock Speed	1	.45	<1
Set Point Class. X Clock Speed	2	.66	<1
Error	36	1.14	

Table A50

Mean Evaluative Ratings of ME, AS I AM (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.07(1.45)	2.43 (.37)	$\overline{X}$ = 2.75
Norm Below Set Pt. Diet	3.25(1.10)	2.71(1.40)	$\overline{X}$ = 2.98
Norm Below Set Pt. No Diet	3.00 (.98)	2.79 (.88)	$\overline{X}$ = 2.89
	$\overline{X}$ = 3.11	$\overline{X}$ = 2.64	

Hartley's test = 3.94 (a=6, 6 df)

Analysis of Variance for Evaluative Ratings of ME, AS I AM
(Control Groups)

Source	df	MS	F
Set Point Class.	2	.19	1
Clock Speed	1	2.26	2.19
Set Point Class. X Clock Speed	2	.17	1
Error	36	1.03	

Table A51

Mean Potency Ratings for ME, AS I AM (Control Groups)
and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.85(1.15)	4.28 (.35)	$\overline{X}$ = 4.07
Norm Below Set Pt. Diet	3.43 (.25)	3.81 (.80)	$\overline{X}$ = 3.62
Norm Below Set Pt. No Diet	4.05 (.77)	3.70 (.68)	$\overline{X}$ = 3.87
	$\overline{X}$ = 3.78	$\overline{X}$ = 3.93	

Hartley's test = 4.58 (a=6, 6 df)

Analysis of Variance for Potency Ratings of ME, AS I AM (Control Groups)

Source	df	MS	F
Set Point Class.	2	.72	1.11
Clock Speed	1	.25	<1
Set Point Class. X Clock Speed	2	.66	<1
Error	36	.65	

Table A52

Mean Activity Ratings for ME, AS I AM (Control Groups) and their Variances (Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.24 (.89)	3.14 (.63)	$\overline{X}$ = 3.19
Norm Below Set Pt. Diet	3.38 (.72)	2.76 (.54)	$\overline{X}$ = 2.95
Norm Below Set Pt. No Diet	3.26(1.48)	3.66 (.82)	$\overline{X}$ = 3.46
	$\overline{X}$ = 3.29	$\overline{X}$ = 3.19	

Hartley's test = 2.72 (a=6, 6 df)

Analysis of Variance for Activity Ratings of ME, AS I AM (Control Groups)

Source	df	MS	F
Set Point Class.	2	.93	1.13
Clock Speed	1	.0064	<1
Set Point Class. X Clock Speed	2	.55	<1
Error	36	.82	

Table A53

Mean Evaluative Ratings of ME, AS OTHERS SEE ME (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.23(1.11)	2.39 (.54)	$\bar{X}$ = 2.81
Norm Below Set Pt. Diet	3.36(1.27)	3.21(1.40)	$\bar{X}$ = 3.29
Norm Below Set Pt. No Diet	2.71(1.09)	3.04(1.07)	$\bar{X}$ = 2.88
	$\bar{X}$ = 3.10	$\bar{X}$ = 2.88	

Hartley's test = 2.61 (a=6, 6 df)

Analysis of Variance for Evaluative Ratings of ME, AS OTHERS SEE ME (Control Groups)

Source	df	MS	F
Set Point Class.	2	.93	<1
Clock Speed	1	.50	<1
Set Point Class. X Clock Speed	2	1.18	1.09
Error	36	1.08	

Table A54

Mean Potency Ratings of ME, AS OTHERS SEE ME (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	4.33(1.26)	4.86(2.14)	$\overline{X}$ = 4.59
Norm Below Set Pt. Diet	3.81 (.70)	4.28 (.46)	$\overline{X}$ = 4.05
Norm Below Set Pt. No Diet	4.33 (.30)	4.12 (.56)	$\overline{X}$ = 4.22
	$\overline{X}$ = 4.16	$\overline{X}$ = 4.42	

Hartley's test = 7.21 (a=6, 6 df)

Analysis of Variance for Potency Ratings of ME, AS OTHERS SEE ME (Control Groups)

Source	df	MS	F
Set Point Class.	2	1.09	1.21
Clock Speed	1	.73	<1
Set Point Class. X Clock Speed	2	.60	<1
Error	36	.90	

Table A55

Mean Activity Ratings of ME, AS OTHERS SEE ME (Control Groups)
and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	3.52(1.14)	3.42 (.51)	$\bar{X}$ = 3.47
Norm Below Set Pt. Diet	3.04 (.53)	3.28 (.79)	$\bar{X}$ = 3.16
Norm Below Set Pt. No Diet	3.28 (.80)	3.57 (.50)	$\bar{X}$ = 3.43
	$\bar{X}$ = 3.28	$\bar{X}$ = 3.42	

Hartley's test = 2.30 (a=6, 6 df)

Analysis of Variance for Activity Ratings of ME, AS OTHERS SEE ME
(Control Groups)

Source	df	MS	F
Set Point Class.	2	.39	<1
Clock Speed	1	.21	<1
Set Point Class. X Clock Speed	2	.15	<1
Error	36	.71	

Table A56

Mean Evaluative Ratings for ME, AS I WOULD LIKE TO BE
(Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	1.92(1.25)	1.43 (.31)	$\overline{X}$ = 1.67
Norm Below Set Pt. Diet	2.04 (.26)	1.54 (.18)	$\overline{X}$ = 1.79
Norm Below Set Pt. No Diet	1.50 (.33)	1.64 (.50)	$\overline{X}$ = 1.57
	$\overline{X}$ = 1.82	$\overline{X}$ = 1.54	

Hartley's test = 7.12 (a=6, 6 df)

Analysis of Variance for Evaluative Ratings for ME, AS I WOULD LIKE TO BE (Control Groups)

Source	df	MS	F
Set Point Class.	2	.16	<1
Clock Speed	1	.83	1.77
Set Point Class. X Clock Speed	2	.47	1.0
Error	36	.47	

Table A57

Mean Potency Ratings for ME, AS I WOULD LIKE TO BE (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	4.71 (.61)	4.81 (.40)	$\overline{X}$ = 4.16
Norm Below Set Pt. Diet	4.71 (.83)	4.95 (.09)	$\overline{X}$ = 4.83
Norm Below Set Pt. No Diet	5.28 (.27)	4.71 (.65)	$\overline{X}$ = 5.00
	$\overline{X}$ = 4.90	$\overline{X}$ = 4.82	

Hartley's test = 9.21 (a=6, 6 df)

Analysis of Variance for Potency Ratings for ME, AS I WOULD LIKE TO BE (Control Groups)

Source	df	MS	F
Set Point Class.	2	.21	<1
Clock Speed	1	.06	<1
Set Point Class. X Clock Speed	2	.65	1.37
Error	36	.47	

Table A58

Mean Activity Ratings for ME, AS I WOULD LIKE TO BE (Control Groups) and their Variances
(Variances appear in parentheses)

	Fast Clock	Slow Clock	
Norm At Set Point	2.38 (.68)	2.33 (.60)	$\overline{X}$ = 2.35
Norm Below Set Pt. Diet	2.33 (.59)	2.23 (.43)	$\overline{X}$ = 2.28
Norm Below Set Pt. No Diet	2.33 (.63)	2.66 (.48)	$\overline{X}$ = 2.50
	$\overline{X}$ = 2.35	$\overline{X}$ = 2.41	

Hartley's test = 1.57 (a=6, 6 df)

Analysis of Variance for Mean Activity Ratings of ME, AS I WOULD LIKE TO BE (Control Groups)

Source	df	MS	F
Set Point Class.	2	.17	<1
Clock Speed	1	.04	<1
Set Point Class. X Clock Speed	2	.19	<1
Error	36	.57	