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Obesity and Restraint in Relationship to Externality and Food Consumption

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OBESITY AND RESTRAINT
IN RELATIONSHIP TO
EXTERNALITY AND FOOD CONSUMPTION

by

Donna Munic

A Thesis Submitted to the Faculty of the Graduate School
of Loyola University of Chicago in Partial Fulfillment
of the Requirements for the Degree of
Master of Arts

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VITA

The author, Donna Munic, is the only child of Morris Munic and Doris (Bernick) Munic. She was born November 22, 1954, in St. Paul, Minnesota.

Her elementary education was obtained at Homecroft Grade School, St. Paul, Minnesota. She graduated with Highest Distinction from Highland Park Senior High School in 1972.

In September, 1972, she entered Northwestern University, Evanston, Illinois, and in June, 1976, received the degree of Bachelor of Arts with Honors, with a major in psychology and minors in sociology and education. While attending Northwestern University, she was a member of Sigma Tau Sorority during 1972-1973. She was elected into the Honors Program of Psychology in 1975. In 1976 she became certified to teach social sciences, grades 6-12 in Illinois.

Donna began graduate study at Loyola University of Chicago in the Clinical Psychology Program in September, 1976. She received a United States Public Health Fellowship 1976-1977, and a departmental graduate assistantship 1977-1978.

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CHAPTER I

INTRODUCTION

Americans seem to be preoccupied with weight. Individuals join Weight Watchers, Take Off Pounds Sensibly (TOPS), and Counterweight to shed pounds. Doctors prescribe medications, e.g., Preludin, to patients and place them on strict diets. Moreover, hundreds of diet books by different authors flood the market.

Some people follow the medical advice, adhere to the prescribed diet program, and do shed pounds without ever gaining back their losses. Most people, however, are not so successful for even if they do lose weight they quickly gain back the weight once the diet is completed. The obvious question arises, why do people get and stay fat?

Almost all diet experts and laymen alike would agree that the majority of cases of obesity simply result from caloric intake exceeding energy expenditure. In other words, fat people eat too much. With the exception of the relatively rare incidences of obesity due to hormonal or metabolic abnormalities, the primary cause of obesity or the reason people overeat remains elusive.

Stanley Schachter initiated a body of research that sheds some light on the mystery of why some people overeat and become fat. He found that there are major differences among individuals in the extent to which physiological changes are associated with the desire

to eat. Specifically, for the obese, in contrast to normal weight individuals, eating was found to be unrelated to internal visceral state and more dependent upon external cues (Schachter, 1971). Moreover, this heightened externality of the obese was found to extend beyond the eating domain (Schachter & Rodin, 1974).

In recent years Nisbett has proposed that the demonstrated externality of the obese, as a group, is a direct result of their being in a chronic state of deprivation or below set point (Nisbett, 1972). From Nisbett's theory it has been suggested that many obese (i.e., hyperplastic, hypotrophic obese) are struggling to maintain a compromise weight through weight suppression or restraint that is normatively excessive but physiologically insufficient. The notion that the degree of restraint, rather than the degree of overweight, may be the relevant factor in producing "obese" behavioral patterns has led to a search for individual differences in eating as well as in noneating behavior in a population of normal weight individuals. Evidence from studies, which classify subjects as Restrained or Unrestrained eaters either by using a physiological measure (Hibsher & Herman, 1977) or by a behavioral self-report measure (Herman & Hertz, 1975; Herman & Mack, 1975; Herman & Polivy, 1975), supports conceptualization of externality, distractibility, hyperemotionality, and certain eating patterns as correlates of weight suppression instead of as attributes of obesity.

The present study further examines the relative predictive power of degree of restraint versus degree of overweight in two ways.

First, an externality task, similar to the one used by Rodin, Herman, and Schachter (1974) is employed as a nonconsummatory behavior assessment.

Second, there is a focus on the effects of modeling on subjects' eating. Intuitively, it appears reasonable to expect that another person would serve as an external cue; however, there has been a relative lack of data addressing this issue. In the present study, model behavior is manipulated by either having the model eat or not eat. Moreover, the influence of attributes of a model on a subject's consummatory response is examined by using a female obese model or a female normal weight model.

CHAPTER II

REVIEW OF RELATED LITERATURE

Obesity and External Food-Related Cues

In the search for the causes and the correlates of obesity, Stanley Schachter and his colleagues have investigated the eating behavior of obese and normal weight humans. Schachter, Goldman, and Gordon (1968) in the guise of a taste experiment manipulated two variables, i.e., fear and food deprivation.¹ Number of crackers eaten was the dependent measure. Results showed normal individuals ate considerably fewer crackers when preloaded with roast beef sandwiches than when their stomachs were empty and they ate fewer crackers in the High Fear condition. On the other hand, obese ate as much, if not slightly more, when preloaded than when not preloaded but they did not eat significantly more in the High Fear condition than in the Low Fear condition. Seemingly, the obese were less sensitive to manipulated internal states involved with eating than were normal weight people.

This decreased sensitivity to internal physiological signals of hunger was not seen as a result of mislabeling or confusing other

¹There is evidence (Carlson and Cannon, both cited in Schachter, 1971) that fear inhibits gastric motility and increases blood sugar level, both of which are viewed as peripheral physiological correlates of non-hunger.

internal states such as fear and anxiety with hunger. Schachter hypothesized instead that internal visceral state is not relevant to eating by the obese and that external food-related cues alone trigger their eating. In other words, the obese literally do not know when they are hungry, a position also held by Stunkard and Koch (1964) who provided evidence of a lack of correspondence between internal state, as measured by stomach contractions, and reported hunger by the obese. Thus, the obese must rely on environmental and social external cues in deciding when to eat and when to stop. The external food-related cues examined were the taste of food, the visibility and the quantity of food, and the time of day.

Various researchers have been concerned with the effects of taste on eating behavior of the obese and normal weight people. Hashim and Van Italie (1971) restricted normal and overweight subjects to a diet of unlimited quantity of a bland, unappetizing, liquid formula, similar to Metracal. Obese markedly decreased their food consumption when subjected to this dietary regime, whereas normal weight subjects consumed their normal amount of food, consuming in this condition much more than the obese. Although these findings support the notion of a greater taste sensitivity of the obese, the greater motivation of the obese to lose weight in this closed setting makes the role of taste sensitivity somewhat unclear.

Nisbett (1968) manipulated the quality or taste of food by giving obese, normal weight, and underweight subjects either a good or bad tasting ice cream. As expected, obese subjects ate

significantly more of the good tasting, creamy, French vanilla ice cream than underweight and normal weight individuals. There were, however, no differences between weight groups on the amount of bad tasting ice cream consumed. Schachter (1971) conjectured that Nisbett's failure to find differences in taste sensitivity in the bad tasting ice cream condition was probably due to this ice cream being so extremely bad.

Deck's replication of Nisbett's study supports Schachter's conjecture. Decke (1971) supplied subjects with either decent or bad tasting, though not appallingly bad, milkshakes (i.e., containing .04 grams of quinine per quart as compared to Nisbett's 2.5 grams per quart). Obese subjects drank more than normal weight subjects if they received decent tasting milkshakes, while they drank significantly less than normals if they were given milkshakes with quinine in them.

The greater taste sensitivity of the obese in comparison to normals is reflected not only by how much they eat but also where they eat. Assuming dormitory food is unappetizing (as documented by student conducted surveys), Goldman, Jaffa, and Schachter (1968) determined how many Columbia College freshmen had terminated their board contracts. These experimenters found that 86.5% of fat freshmen had dropped their food dorm contracts as compared to 61.1% of normal weight freshmen.

Thus, in four separate experiments (Decke, 1971; Goldman, Jaffa, & Schachter, 1968; Hashim & Van Italie, 1971; Nisbett, 1968)

taste, seen as one external determinant of eating behavior, has been found to markedly affect the eating behavior of obese but has relatively little effect on normal sized subjects.

Visibility and quantity of food were examined as other external food-related cues in four experiments. Nisbett (1968) presented overweight, normal weight, and underweight males, who had not eaten lunch, with either one or three roast beef sandwiches. Just prior to leaving the room, the experimenter told subjects there were more sandwiches located in the refrigerator and subjects should help themselves. Results revealed obese when presented with three sandwiches subsequently ate significantly more than normal weight or underweight subjects, but when obese were presented with one sandwich they ate just as little as underweight subjects and significantly less than normal weight subjects. Nisbett's findings, thus, support the notion that obese are more responsive to external cues, i.e., visibility and quantity of food. Moreover, these findings suggest that in order for external cues to trigger eating they must be immediate, compelling, and potent. Specifically, roast beef sandwiches positioned directly in front of the obese were immediate, compelling, and potent external cues and consequently were sufficient to trigger eating. Having knowledge that roast beef sandwiches were in the refrigerator was not sufficient to trigger obese's eating since the food-related cues were not immediate, compelling, and potent. It appears that obese individuals' behavior follow the saying, "out of sight, out of mind."

Ross (1971) pursued the possibility that external cues, such as visibility, must be compelling and potent in order to affect the obese. In one condition subjects were seated in a dimly lighted room before a bowl of shelled nuts, whereas in the other condition the room was normally brightly lighted. Obese subjects ate significantly more nuts in the brightly lighted room than in the dimly lighted room (36.9 grams versus 18.8 grams). For normal weight subjects the degree of illumination made no difference with respect to their eating behavior.

Not only does seeing actual food affect eating of the obese, visual representations of food can also serve as external cues which trigger their eating. Tom and Rucker (1975) compared food consumption of normal weight and obese individuals after exposure to either food slides or nonfood slides. Results showed that obese ate more crackers after being exposed to food slides than after being exposed to nonfood slides. This was not the case for normal weight persons.

In an attempt to generalize the experimentally derived findings on visibility of food, Goldman, Jaffa, and Schachter (1968) examined the relationship of overweight to fasting on Yom Kippur. They hypothesized that if the obese are relatively insensitive to internal states of hunger and if their eating is triggered predominantly by external cues, then (1) fat Jews should be more likely to fast than normal weight Jews, and (2) fat Jews should find fasting less unpleasant in the synagogue where there are few, if any,

food-related cues. Data on 296 respondents confirmed their predictions. Significantly more obese Jews (83.1%) than normal weight Jews (68.8%) fasted on Yom Kippur; and there was a significant inverse relationship between unpleasantness of fasting and hours spent in the synagogue for the obese but not for the normal weight subjects.

Schachter and Gross (1968) tested the effect of time of day as another external cue affecting the eating behavior of obese and normal weight subjects. Their experimental manipulation entailed doctored clocks to create the impression that it was either before or after regular dinner time. Obese subjects ate significantly more crackers when they believed it was past their ordinary dinner hour than before it, while manipulated time produced the opposite effect for normal weight subjects.

In a field study Goldman, Jaffa, and Schachter (1968) investigated the relationship between weight deviation and the likelihood of spontaneously mentioning difficulties in adjusting to the discrepancy between physiological state and local meal times. Given prior findings, namely, that eating by the obese is virtually independent of internal states and that eating is almost entirely determined by external cues, these researchers hypothesized that the obese would have less difficulty in adjusting to local eating schedules than would normal weight people. Subjects were 236 flight personnel on the Paris-New York and the Paris-Montreal routes. As expected, overweight personnel complained significantly less about

the effects of time changes on eating than did nonoverweight personnel.

Two studies further illustrate the effects of time in real life situations where time is likely to covary with the abundance and the distribution of food-related and nonfood-related cues. (It was predicted that obese students were more likely to skip breakfast because breakfast is the meal least involved with external cues and most confounded by competing nonfood-related cues such as sleeping, shaving, washing, classes, etc.) Normals, meanwhile, who are less sensitive to external cues and more responsive to internal cues, ought to eat when their stomachs tell them rather than when the circumstances dictate. (Data confirmed the prediction; 79% of the obese in comparison to 44% of normals reported that they did not eat breakfast.) Similarly, it was hypothesized that the obese should be more likely to forgo lunch during the weekend when there are more unpredictable and interfering activities and competing cues than during the week when lunch is integrated into highly routinized schedules. This hypothesis was confirmed; on weekdays there were no differences in eating lunch among obese and normal weight subjects, but on weekends fat subjects were far more likely to skip lunch. Finally, if the timing of food-related cues is irregular and unpredictable on weekends and systematic on weekdays, then the obese students should be more irregular about dinnertime on weekends in comparison to normals. For the obese, there was a mean difference of 1.5 hours for dinners on weekends in comparison to a discrepancy

of only 12.5 minutes on weekdays. For normals, there was a trivial and nonsignificant trend in the opposite direction with a discrepancy of 83.9 minutes on weekdays in comparison to a mean difference of 68.6 minutes for weekend dinners.

In summary, Schachter and his colleagues found that for the obese, unlike for normal weight individuals, eating is unrelated to internal visceral state but it is instead determined by external food-related cues such as the sight, the quantity, and the taste, and in some circumstances the time.

Other Attributes of the Obese

The heightened externality or dependency on external cues of the obese with respect to eating seemed to extend beyond the eating domain. Rodin, Herman, and Schachter (1974) compared the performance of obese and normal weight subjects on a variety of tests of external sensitivity. Their results showed that the obese responded more quickly in complex reaction time, recalled more items in immediate recall, and recognized words at shorter duration in tachistoscopic recognition thresholds than did normals.

In another study Rodin (1973) again demonstrated the superior performance of the obese on two tests of external sensitivity--reaction time and proofreading--but only when there was no distracting stimulus or prominent competing external cue, e.g., noise. When a distracting cue was present, the performance of the obese deteriorated significantly whereas that of the normal weight subjects did not. Rodin interpreted her findings as support for

Schachter's generalized external sensitivity model. Specifically, external cues compel the attention of the obese; that is, they are more likely to attend to the immediate perceptual field be it the task at hand or an external distracting stimulus than nonobese. Consequently the performance of the obese is high when there are no competing cues, but decreases when there are competing cues as the obese readily attend to these competing cues.

Pliner (1976) further investigated the generalized externality of the obese to visual, auditory, and cognitive cues in three separate experiments. In the first study Pliner found that, whether thinking behavior was measured directly by self report or indirectly by distraction from pain, the obese thought more about an assigned topic than normal weight individuals if the topic was accompanied by strong and relevant visual cues (i.e., high salience) and the obese thought less about a topic if the topic was not accompanied by such cues (i.e., low salience). In a second study Pliner presented subjects with auditory cues. Salience was manipulated by varying loudness with time estimation serving as the response. Results showed that obese subjects estimated the time elapsed as significantly longer than did normal weight subjects in the high salience condition, while in the low salience condition the direction of the difference was reversed. In a third study it was predicted that there would be differences between obese and normal weight students in studying behavior. It was predicted that when an exam was very close and thus highly salient obese students would report spending more time

studying than would normals, whereas when the exam was scheduled for a long time off obese would report spending no more time studying than normals. Her prediction was supported. Thus, in each of the experiments, data supported the notion of obese-normal weight differences in general sensitivity to external cues with the qualification that these cues must be high in salience.

Interestingly, a heightened externality to food-related cues was also evident in ventromedial hypothalamus lesioned (VMH-lesioned) animals (Teitelbaum, 1955). Furthermore, other similarities between VMH-lesioned rats and obese humans that extended beyond the eating domain have been noted. VMH-lesioned rats and the obese share the common behavioral characteristics of externality, hypoactivity, distractibility, hyperemotionality, and hyposexuality (Bruch, 1957; Nisbett, 1972; Schachter & Rodin, 1974). These striking parallels between the obese and the VMH-lesioned rats prompted Schachter to slightly modify his basic position, namely, that the heightened externality of the obese is the primary cause of their obesity. He contends presently that obese individuals have functionally quiescent ventromedial hypothalami. Thus, to Schachter, the obese's lack of responsitivity to internal cues in eating and their heightened externality is a direct manifestation of an inactive, but organically intact ventromedial hypothalamus.

Nisbett's Theory

Nisbett, however, has offered an alternative explanation as to why the obese behave the way they do. Like Schachter's

obese and VMH-lesioned rats, hungry organisms are more likely to eat in a novel situation, to eat more per sitting, and to be highly taste responsive (Jacobs & Sharma, 1974). Extreme hunger also has other powerful effects on behavior. Keys et al. (1974) found that as male conscientious objectors lost weight they became more inactive, more prone to emotional upset, and hyposexual. Was there a parallel between obese and hungry organisms? Further research revealed that hungry organisms and the obese have elevated levels of free fatty acids (FFA) in their bloodstreams.² Nisbett thus concluded that the obese are, in fact, hungry organisms (Nisbett, 1972).

Specifically, Nisbett proposed a theory whereby the size and the number of fat cells which are determined by heredity and early environment signal the ventromedial hypothalamus to stimulate food intake so as to bring an individual into line with his biologically determined setpoint (Nisbett, 1972).

Physiological support for Nisbett's theory came in part from work done by Hirsch and Knittle (cited in Herman, 1974). They found that individuals differ by as much as three times the number

²The level of FFA is generally agreed upon as the mechanism of communication between the level of adipose tissue shortage and the satiety center of the brain. When organisms are food deprived, FFA are mobilized from adipose tissue to meet energy requirements. When something is eaten, FFA levels fall rapidly. However, the level of FFA is relatively inflexible in the obese. After short term deprivation an obese's already high FFA level increases only slightly, while a normal weight person's initial low FFA level increases greatly (Bray & Bethune, 1974, p. 53).

of adipocytes (fat cells). In addition, Dr. Sims discovered that the number of fat cells remained relatively fixed in adults despite great weight fluctuations. Dieting decreased the size of the fat cells, but did not affect the number of adipocytes, and conversely overeating increased the size of the fat cells, but did not alter their original number (cited in Bray & Bethune, 1974).

Evidence suggested, too, that the hypothalamic feeding centers adjusted food intake to maintain fat stores at the baseline or setpoint (Powley & Keeseey, 1970). Since individuals differ in the number of fat cells, it seems reasonable to assume that individuals have different baselines and that the hypothalamus defends these different baselines. This proposition offered a new way of looking at obesity.

According to Nisbett, the obese as a group are endowed with more fat cells than their normal weight counterparts, and thus they should overeat in an attempt to satisfy the demands of their adipocytes. However, the obese are also under considerable social and medical pressure to reduce, so most tend to exercise some degree of restraint in eating. Their heightened emotionality, distractibility, externality, and their hungry pattern of food-seeking behavior is seen as a result of their being below setpoint.

Behavior Similarities Between Obese Humans and Restrained Eaters

A number of studies have examined individual differences in setpoint in a population of normal weight college students by classifying subjects by the degree of restraint. High Restrained

eaters are seen as people who exhibit a behavioral and attitudinal concern about dieting and not gaining weight and who are presumably below setpoint. Low Restrained eaters are viewed as individuals who are not concerned with dieting and gaining weight and who are presumably at or near setpoint. If High Restrained eaters resemble Schachter's obese, then there is indirect support for the relative deprivation model. Furthermore, if Low Restrained eaters resemble Schachter's normal weight subjects, then Nisbett's theory is more convincing.

Herman and Mack (1975) measured restraint by administering an Eating Habits Questionnaire.³ In the guise of a taste experiment subjects received preloads of zero, one, or two milkshakes, and later were given a 10 minute "taste" period. Results showed that High Restrained eaters' intake varied directly with preload size, while Low Restrained eaters' intake varied in an inverse proportion to preload size. Apparently the milkshake preload triggered the hungry externally controlled eating behavior in High Restrained eaters but inhibited the further eating in Low Restrained internally regulated eaters.

Hibscher and Herman (1977) replicated Herman and Mack's experiment with male obese, normal weight, and underweight subjects

³The questionnaire is composed of 11 items. Six items concern diet and weight history of a subject and five items reflect personal attitudes toward food and eating. See Appendix A for the content and the scoring of the specific questions.

classified by FFA level; that is, individuals with an initial high FFA level were considered to be below setpoint (High Restrained eaters), and those with an initial low FFA level were considered to be at or near setpoint (Low Restrained eaters). The expected cross-over interaction was obtained. Subjects with an initial high FFA level consumed less ice cream when not preloaded, whereas subjects with an initial low level of FFA consumed less when preloaded. While restraint was noted as a reliable predictor of eating behavior and physiological attributes of subjects, there was no indication that degree of overweight per se exerted such effects.

The parallel between High Restrained eaters and the obese was also demonstrated in an anxiety study. Herman and Polivy (1975) assigned 42 female subjects to fear of tactile stimulation conditions as in Schachter et al. (1968). Subjects were retrospectively designated as Restrained or Unrestrained eaters on the basis of their scores on the Eating Habits Questionnaire. Findings were in substantial agreement with those of Schachter et al. (1968). Unrestrained eaters, comparable to Schachter's normal weight subjects, ate significantly less when anxious and Restrained eaters, comparable to Schachter's obese, ate nonsignificantly more. Note, too, that Restrained High anxiety subjects, like Schachter's obese, reported themselves to be more disturbed by anticipation of electric shock than Unrestrained High anxiety subjects.

Herman and Hertz (1975) provided evidence that distractibility (an "obese" behavioral attribute) also characterized normal weight

Restrained individuals. Using a proofreading task and distractors (i.e., tape recordings of random numbers and emotionally toned materials) as Rodin (1973), they showed that distraction interfered with Restrained eaters' performances, but it had somewhat of a facilitative effect on Unrestrained eaters' performances. This differential response to distraction was precisely the same as that exhibited by Rodin's obese and normal weight subjects.

Herman, Polivy, Pliner, Threlkeld, and Munic (1978) in two separate experiments further studied the effect of distractibility on Restrained and Unrestrained eaters. In the first experiment it was found that distraction initially impaired the performance of Restrained eaters and facilitated the performance of Unrestrained eaters as previously found in Herman and Hertz (1975) and in Rodin (1973). However, subsequent retesting of the same subjects in succeeding monthly sessions revealed a complete reversal of the original results. It was suggested that emotional arousal, perhaps due to mid-term and final examinations in the later sessions or due to subjects' expectations of improvement on a now familiar task, may have been responsible for these findings. The second experiment was designed to investigate this notion of arousal on performance. Results showed that when subjects were in a situation of minimal threat, the reaction to distraction found in the first phase of Experiment 1 was obtained. In a high threat situation, the relative distractibility of Restrained and Unrestrained eaters was reversed, as in the second and the third sessions of Experiment 1. These

researchers interpreted their findings in light of the inverted U performance-arousal level curve. Specifically it was proposed that Unrestrained eaters, when neither anxious nor distracted, are at the lowest level of arousal and exhibit a low level of performance. The addition of either distraction or anxiety facilitates performance presumably because each variable increases arousal toward the optimal level of performance. When both variables occur together, however, they create a degree of arousal greater than optimal. As for Restrained eaters, past research has shown that Restrained eaters (Herman & Polivy, 1975) paralleling the obese (Schachter & Rodin, 1974) are characterized by a relative hyperemotionality. Moreover, FFA level, generally agreed upon as a physiological index of hunger, has also been cited as an index of stress, i.e., high FFA level is associated with greater levels of stress than low FFA level (Hibscher & Herman, 1977). Thus, Restrained eaters may be seen as close to their optimal level of performance already, and consequently they do best when neither further distracted nor when made anxious. The addition of either distraction or anxiety serves only to produce decrements in performance.

In summary, a parallel between the obese and Restrained eaters has been demonstrated. The heightened externality of the obese and Restrained eaters is reflected in their similar pattern of food consumption. Distraction disrupts their performance when they work on a task requiring concentration. Finally, Restrained eaters, like obese subjects, react to emotionally provocative stimuli more

strongly than Unrestrained eaters or normal weight subjects (i.e., Restrained eaters and the obese exhibit hyperemotionality).

This experiment is specifically designed to further investigate the behavior of Restrained and Unrestrained eaters. As noted, numerous times, obese and Restrained eaters are highly susceptible to external food-related cues. Furthermore, evidence supports the notion that the obese are generally more responsive to salient stimuli, food relevant or not, than are normals (Rodin, Herman, & Schachter, 1974). To test Restrained eaters on this "generalized externality" hypothesis, an immediate recall test similar to the one used by Rodin et al. (1974) is employed.

Modeling Influences

The second focus of this study is concerned with the effects of modeling on eating behavior. The prevailing influence of example in the development and the regulation of human behavior is evident from informal observation. People do not rely solely on differential reinforcement of trial-error performance in learning sports, religious practices, singing, familial customs, speaking, mores, occupational activities, etc. If they do, then the chances of their making fatal mistakes and few advancements or even not acquiring the appropriate response patterns would be too great.

Within the framework of social learning theory, modeling influences are assumed to produce learning principally through their informative function. Moreover, it is felt that observers acquire mainly symbolic representation of modeled activities rather than

specific stimulus-response associations. In this formulation, the extent to which modeling influences affect the acquisition and the performance of imitative behavior is governed by four interrelated subprocesses: (1) attentional processes which regulate sensory registration of modeled events; (2) retention processes which symbolically code information; (3) motoric processes which involve utilization of symbolic representation of modeled responses to guide overt behavior; (4) reinforcement and motivational processes which determine whether acquired responses will or will not be activated into overt performance (Bandura, 1971). Thus, the absence of appropriate modeling behavior following exposure to a model may result from one or more of the following--lack of attention, undifferentiation of model's responses, retention decrements, inadequate symbolic coding, motoric deficiencies, lack of direct reinforcement, or negative anticipatory consequences.

At this point, it should be pointed out that the social learning view of observational learning has not been the only theory proposed to explain how people learn by observing the behavior of others. Contemporary learning interpretations of modeling have also been given by theorists such as Skinner, Miller and Dollard, and Baer and Sherman. The social learning theory perspective differs from these other learning perspectives in the locus of response integration, i.e., whether the response integration occurs mainly at a central or peripheral level. According to social learning theory, behavior is learned, at least roughly, prior to behavior

reproduction (performance) or to the appearance of reinforcement; thus, the theory argues for central response integration. Other learning theories, meanwhile, believe responses are organized peripherally during overt performance. The social learning perspective also differs from other learning views in that reinforcement is seen as a facilitating condition by facilitating learning through its effects on attentional, organizational, and rehearsal processes. This perspective is unlike operant conditioning theories where reinforcement is viewed as a necessary condition, acting backward to strengthen preceding imitative responses and their association to stimuli. Note, too, cognitive mediation plays an important role in social learning theory which is not the case in other learning views where behavior is conceptualized as learned through an automatic action of consequences. Specifically, social learning proponents contend that the effects of reinforcement are cognitively mediated with observational learning dependent on an individual's awareness of reinforcement contingencies as well as the value he places on both the required behavior and the reinforcers. According to social learning, utilization of cognitive skills provides people with the capacity for insightful and foresightful behavior, because through the capacity to represent actual outcomes symbolically, future consequences can be converted into present motivators that influence behavior similarly to the way actual consequences affect behavior.

Within the framework of social learning theory Bandura (1971)

has identified three major effects of modeling influences: first, observers can acquire new patterns of behavior by watching the behavior of others, i.e., observational learning effects; second, modeling influences can strengthen or weaken inhibitions of previously learned responses, i.e., inhibitory/disinhibitory effects; third, models can serve as cues in facilitating the performance of existing responses, i.e., response-facilitation effects.

In this experiment, consideration is given to the second and the third functions of modeling influences. If an obese model can inhibit eating of some subjects, because the subjects perceive the model's behavior as producing punishing consequences (i.e., obesity), then inhibitory processes would appear to be involved. Furthermore, if models who eat are more likely to prompt certain subjects to eat, and models who abstain from eating are more likely to induce abstinence in these subjects, then this would suggest that response-facilitation effects would be taking place. These notions were examined more closely below.

It has been aptly documented that the behavior of competent, intelligent, attractive, and powerful models is more likely to be imitated and hence have a greater value for observers than the behavior of incompetent, stupid, unattractive, and weak models (i.e., in Bandura's terms, subordinate standing models) (Bandura, 1971). In this study, attributes of models are examined by having subjects exposed to either an obese model (approximately 65% overweight) or a normal weight model (approximately 0% overweight).

In exploring attitudes toward the obese, Wolfgang and Wolfgang (1971) found that subjects made twice as many negative statements than positive ones about obesity. Results also indicated that male subjects in the study positioned themselves (indicating distance of optimal comfort) further from obese and drug addicts than from normal and police figures. Furthermore, Ayllon (1975) in a review of several studies concluded that people, indeed, do react negatively to overweight people. Presumably, then, obese models should be perceived as unattractive and nonprestigious models which should subsequently affect the impact they have on certain observers.

Unrestrained eaters should not be affected by the influence of an unattractive model, i.e., the obese model, because they are internally regulated with respect to eating; they eat when they are hungry and they do not eat when they are satisfied. On the other hand, Restrained eaters, who are greatly concerned with body weight and dieting, should react to the obese model. Watching an obese person eating caloric-heavy food, like chocolate candy, should raise their levels of restraint by clearly and visibly reminding the Restrained eaters of the future consequences of indulging--namely, the socially unacceptable and negative physical condition of obesity, e.g., unattractiveness, difficulties and awkwardness in movement, and the presumed health problems associated with obesity. In essence, then, the obese model's eating behavior would be inferred as self-punitive to Restrained eaters, which in turn should produce decrements in eating for these externally controlled subjects. Hence,

inhibitory processes are indicated.

Turn now to response-facilitation effects involved in modeling. Since Restrained eaters are more highly susceptible to salient cues in the environment than Unrestrained eaters, the former should be more likely to imitate the behavior of their models. Indeed, Restrained eaters' behavior would most likely be prompted and channeled by the actions of others who serve as potent external cues. Thus, in noneating model conditions it would appear that Restrained eaters would most likely abstain from eating or eat relatively little amounts of candy. For Restrained eaters in the observed eating, however, restraint would seem to break down and eating would be triggered because of the model's behavior. However, it is suspected that response-facilitation in eating model conditions would occur only in the normal weight model eating condition, whereas inhibitory effects would override response-facilitation effects in obese model eating conditions for Restrained eaters.

Hypotheses

Basically this study incorporates a test of general externality, adopted from Rodin et al. (1974) and an assessment of the effects of modeling influences on eating behavior. The specific hypotheses being tested include: (1) Restrained eaters remember more items on an externality task than Unrestrained eaters; (2) Obese and normal weight individuals do not differ in their performances on an externality task. (Although degree of restraint and per cent overweight may be normally correlated with each other, they are theoretically

independent factors and the effect of each on externality can be assessed independently.); (3a) Restrained eaters restrict their food intake in noneating model conditions as compared to Unrestrained eaters in the same conditions; (3b) Restrained eaters restrict their food intake in eating obese model conditions as compared to Unrestrained eaters in eating obese model conditions; (3c) Restrained eaters increase their food intake in eating normal weight model conditions as compared to Unrestrained eaters in eating normal weight model conditions; (4) Unrestrained eaters are relatively unaffected by the experimental manipulations and they eat proportionately equal amounts in all conditions; (5) Obese and normal weight individuals do not differ from each other in their food consummatory response in each of the experimental conditions.

CHAPTER III

METHOD

Subjects

A total of 60 Loyola University of Chicago female undergraduates served as subjects in partial fulfillment of an introductory psychology requirement. Prior to the experimental session all introductory psychology students completed an Eating Habits Questionnaire designed to measure degree of restraint in eating behavior. High scoring females, classified as Restrained eaters, and low scoring females, classified as Unrestrained eaters, were contacted by phone and asked to participate in an experiment. Subjects' scores on this first administration of the Eating Habits Questionnaire, however, were not employed in subsequent analysis of the data. Instead it was decided to analyze the data using restraint scores derived from the second administration of the Eating Habits Questionnaire. Subjects were randomly assigned to one of five experimental conditions--obese non-eating model, obese eating model, normal weight noneating model, normal weight eating model, or no model. The number of Restrained and Unrestrained eaters comprising each condition was equal.

Materials

Five experimental slides were used in the externality task. Two of the slides portrayed five food-related items and eight nonfood-

related item, while three of the slides portrayed only 13 nonfood related items. The ordering of the slides was randomly determined. See Appendix B for the specific contents of each slide.

Two female undergraduate students served as confederate models in the second part of the experiment. One model, designated as an obese model, was approximately 65% overweight according to Metropolitan Life Insurance Company norms. The second model was approximately 0% overweight and she served as a normal weight model.

Procedure

Upon arrival a naive subject was escorted into a room with or without another person (model). Since it was important that the subject did not perceive the other person as a model, the model was treated as if she was just another subject until the debriefing session. (Note: the model and the experimenter were blind to the restraint scores of the subjects, and consequently neither knew if a specific subject was a Restrained or an Unrestrained eater.) The subject was seated at a long table. If a model was present, the subject sat across from her and if a model was absent, the subject faced an empty chair. A brief introduction was given on the differential effects of various sensory stimuli and the task was explained as providing information on how individuals attend to, encode, and respond to visual stimuli in their environment. The subject and the model were told that a group of words, numbers, and pictures would appear briefly before them and that after each presentation they would be asked to write down all the items they remembered. The experimenter commented on how a one minute interval between each slide

presentation would prevent the material on the preceding slide from interfering with the retention of the items on the next slide. If there were no questions, the experimenter presented the first slide. Five slides were presented for 20 seconds with a one minute period following each during which time the subject and the model recorded remembered items. Following the task the experimenter handed out questionnaires and excused herself from the room. As the experimenter left, she told the subject and the model to help themselves to some M & M's if they desired.

Experimental manipulation: Eating model conditions. While both the subject and the model worked on the questionnaire, the obese or the normal weight model began eating the candy and said, "I like M & M's." She continued to periodically take candy from the bowl, i.e., four M & M's total, until the experimenter returned.

Noneating model conditions. A few seconds after the experimenter departed from the room, the obese or the normal weight model looked at the bowl of candy and stated, "I like M & M's, but I do not think that I want any now." The model then returned to completing her questionnaire and did not take any candy during the time that the experimenter was absent from the room.

No model condition. When the experimenter left the room, the subject remained alone with the candy nearby and the questionnaire in front of her until the experimenter returned.

Eight minutes later, the experimenter reentered the room. The experimenter readministered the Eating Habits Questionnaire and later

weighed the subject.⁴ The subject was then asked orally to convey any suspicions she had about the experiment or about the other person in the room. Finally, the subject was debriefed.

Dependent Measures and Statistics

Externality. Three scores were used in assessing a subject's degree of externality. The first measure, designated as mean correct per slide, was calculated by adding up all the items correctly recalled by a subject and then dividing by five which was the number of slides. As a further measure of externality a subject received a score for mean overt errors per slide which was derived by first summing over the number of items incorrectly recalled on each slide and then dividing by five. The ratio of total food-related items over total nonfood-related items recalled on the slides provided a final measure of externality.

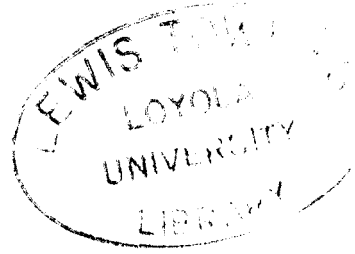
Food Consumption. Food consumption was measured by calculating the amount of M & M's candy consumed in the absence of the experimenter, i.e., weight of candy prior to the experimental session minus the model's consumption (if any) minus the weight of the candy after

⁴Subjects were readministered the Eating Habits Questionnaire for two reasons. First, the scores on this second administration were used in the analysis of the data. Second, scores were collected again so as to determine the test-retest reliability of the restraint index. Subjects were later weighed so as to calculate per cent overweight. Although subjects were asked how much they weighed on the Eating Habits Questionnaire, individuals have a tendency to inadvertently or purposely report inaccurate body weights. Thus, it was thought necessary to actually weigh subjects.

the experimental session. A t-test was run on the two no model control groups with the dependent measure being the grams of candy consumed. A 2 x 2 x 2 analysis of variance for two levels of restraint (Restrained and Unrestrained eaters), two model characteristics (obese and normal weight models), and two model behaviors (eat and does not eat) was performed on the remaining data relevant to food consumption with planned comparisons being made to test the specific hypotheses.

CHAPTER IV

RESULTS



Classification of Subjects

Restraint. The restraint score for each individual was calculated by summing the subscores for questions one through ten and question twelve on the Eating Habits Questionnaire. Question eleven was not scored since the information derived from this question was used to answer question twelve. As recommended by Herman and Mack (1975), the specific scoring procedures for each of the questions follow:

Question 1 was scored as either zero, one, two, three, or four points;

Question 2 was scored as either zero, one, or two points;

Questions 3 and 12 were scored as .20 points for each pound with one point scored for every five pounds;

Questions 4 and 5 were scored as .33 points for each point with one point representing three pounds;

Questions 6, 7, 8, 9, and 10 were scored as either zero, one, two, or three points.

See Appendix A for further information regarding the content and the scoring of specific items.

Subjects' scores on the second administration of the Eating Habits Questionnaire (Restraint Scale) revealed two nonoverlapping distinct groups. Scores for Restrained eaters ranged from 18.4 to

35.6 ($M = 23.1$, $n = 30$), whereas scores for Unrestrained eaters ranged from 4.2 to 16.7 ($M = 11.9$, $n = 30$). In previous studies (Herman & Mack, 1975; Herman & Polivy, 1975) a median split, with a median score of 17, had been shown to effectively discriminate between subjects, i.e., those above 17 were defined as Restrained eaters and those below 17 as Unrestrained eaters. The classification of subjects in this present experiment was thus consistent with past classification of female subjects from a similar population.

To assess the test-retest reliability of the restraint measure initial scores on the Eating Habits Questionnaire were compared with scores on the second administration of the Eating Habits Questionnaire taken approximately one month later. The Pearson product moment correlation coefficient was significant ($r = .74$, $p < .001$).

Weight. Subjects' weights ranged from 97 pounds to 226 pounds. Relative degree of weight deviation was computed from subjects' weights using Metropolitan Life Insurance Company norms, i.e., taking the mean of the medium-built frame for each weight category and adjusting for age by subtracting one pound for each year under 25 years old. Subjects were classified as normal weight if they were 10% or less overweight and subjects were classified as obese if they were 11% or more overweight. Normal weight subjects ($n = 38$) were between -23% to 10% overweight, mean 1.87% overweight. The mean weight for obese subjects ($n = 22$) was 27% overweight, ranging from 11% to 75% overweight.

The relationship between per cent overweight and restraint was assessed by means of a Pearson product moment correlation

coefficient. Results revealed a strong positive correlation ($r = .61$, $p < .001$). However, it should be pointed out that when classified by dichotomous groups of obese versus normal weight and Restrained eaters versus Unrestrained eaters, 19 subjects were classified as Restrained eaters and obese, 11 subjects as Restrained eaters and normal weight, 3 subjects as Unrestrained eaters and obese and 27 subjects as Unrestrained eaters and normal weight.

Externality and Restraint

It was hypothesized that Restrained eaters remember more items on an externality task than Unrestrained eaters. Although the data do not support this hypothesis there was a trend in the predicted direction [$t(58) = 1.75$, $p < .10$] with Restrained eaters recalling on the average 7.29 items as compared to 6.87 items for Unrestrained eaters. On the mean number of overt errors per slide Restrained eaters made .33 errors whereas Unrestrained eaters made .46 errors [$t(58) = 1.44$, n.s.]. Thus, it does not appear likely that Restrained eaters were slightly better, although nonsignificantly so, at recalling items on the slides because they were guessing more than Unrestrained eaters. If they were guessing they would have been expected to have more errors per slide than Unrestrained eaters. Furthermore, the difference in overall recall between Restrained and Unrestrained eaters cannot be accounted for by differences on the food-related items as both groups had a mean of .20 for food-related items over nonfood-related items [$t(58) = .00$, n.s.].

Externality and Weight

It was predicted that obese and normal weight subjects do not differ in their performances on an externality task. The data supports this hypothesis. There was no significant difference between normal weight subjects and obese subjects on the mean number of correct items per slide [$t(58) = .27$, n.s.] with normal weight subjects recalling on the average 7.06 items as compared to 7.11 items for the obese subjects. Moreover, on the mean number of overt errors per slide normal weight subjects made .42 errors whereas obese subjects made .35 errors [$t(58) = .70$, n.s.]. There was, however, an unexpected trend for normal weight subjects to recall proportionately more food-related items than obese subjects [$t(58) = 2.00$, $p < .10$] with normal weight subjects having a mean of .21 as compared to a mean of .19 for obese subjects.

Food Consumption and Restraint

Food consumption was assessed by calculating the amount of M & M's candy eaten by a subject in the absence of the experimenter, i.e., weight of the candy prior to the experimental session minus the model's consumption (if any) minus the weight of the candy after the experimental session.

The mean amount of grams consumed in the various experimental conditions by Restrained eaters and Unrestrained eaters follow: In the no model control condition Restrained eaters ($n = 6$) ate an average of 7.27 grams as compared to an average of 7.10 grams for Unrestrained eaters ($n = 6$). In the normal weight eating model condition Restrained

eaters ($n = 6$) consumed a mean of 1.05 grams whereas Unrestrained eaters ($n = 6$) consumed a mean of 3.02 grams. In the obese eating model condition Restrained eaters ($n = 6$) ate an average of 16.28 grams while Unrestrained eaters ($n = 6$) ate an average of 7.43 grams. In the normal weight noneating model condition the mean amount of food consumed by Restrained eaters ($n = 6$) was 4.03 grams as compared to 6.4 grams for Unrestrained eaters ($n = 6$). Finally, in the obese noneating model condition Restrained eaters ($n = 6$) consumed a mean of .67 grams and Unrestrained eaters ($n = 6$) consumed a mean of 5.87 grams. A Bartlett test of homogeneity of variance on these data pertinent to Restrained eaters' and Unrestrained eaters' food consumption was found to be significant ($\chi^2 = 35.18, p < .001$) thus indicating the use of a log transformation of scores for analyzing the data because the variances were proportionate to treatment means. In using the transformed scores no differences were found between Restrained eaters and Unrestrained eaters on the amount of candy consumed in the absence of a model [$t(10) = .19, n.s.$]. A $2 \times 2 \times 2$ analysis of variance for two levels of restraint (Restrained and Unrestrained eaters), two model characteristics (obese and normal weight model), and two model behaviors (eat and does not eat) was performed on the remaining transformed scores. As shown in Table 1, there was not a significant main effect for restraint nor were any significant restraint interactions found. Although the evidence pointed to a lack of difference between Restrained eaters and Unrestrained eaters on the analysis of variance, the possibility exists that the effects of the various conditions

Table 1

Analysis of Variance for Restraint, Model Characteristic, and
Model Behavior as Related to Food Consumption

<u>Source</u>	<u>df</u>	SS	MS	F
Restraint (R)	1	.05	.05	<1
Model Characteristic (MC)	1	.75	.75	3.00
Model Behavior (MB)	1	.29	.29	1.16
R x MC	1	.02	.02	<1
R x MB	1	.39	.39	1.56
MC x MB	1	1.79	1.79	7.16**
R x MC x MB	1	.16	.16	<1
Error	40	9.84	.25	

**p <.025

could have cancelled each other out. Thus, planned comparisons were still carried out to directly test the hypotheses relevant to food consumption. It was hypothesized that Restrained eaters as compared to Unrestrained eaters restrict their food intake in noneating model conditions. This hypothesis was not supported by the data [$F(1,40) = 1.50$, n.s.]. It was further hypothesized that Restrained eaters restrict their eating in eating obese model conditions. No differences, however, were found between Restrained and Unrestrained eaters in amount of food consumed [$F(1,40) = 1.36$, n.s.]. The prediction that Restrained eaters as compared to Unrestrained eaters increase their food intake in eating normal weight model conditions was also not supported [$F(1,40) = 0.16$, n.s.]. As for the hypothesis that Unrestrained eaters eat proportionately equal amounts in all conditions, the data revealed no differences in amount consumed by Unrestrained eaters whether there was an obese or normal weight present [$F(1,40) = 1.05$, n.s.] who ate or did not eat [$F(1,40) = 0.02$, n.s.]. In addition to the above findings, the data revealed a significant model characteristic x model behavior interaction [$F(1,40) = 7.28$, $p < .025$]. Means of subject (i.e., both Restrained and Unrestrained eaters combined) food consumption in the various modeling conditions, i.e., obese and normal weight models during eating and noneating model conditions, are plotted in Figure 1. As may be seen, subjects ate the most in the obese eating model condition and subjects ate the least in the normal weight eating condition. A Duncan's multiple range

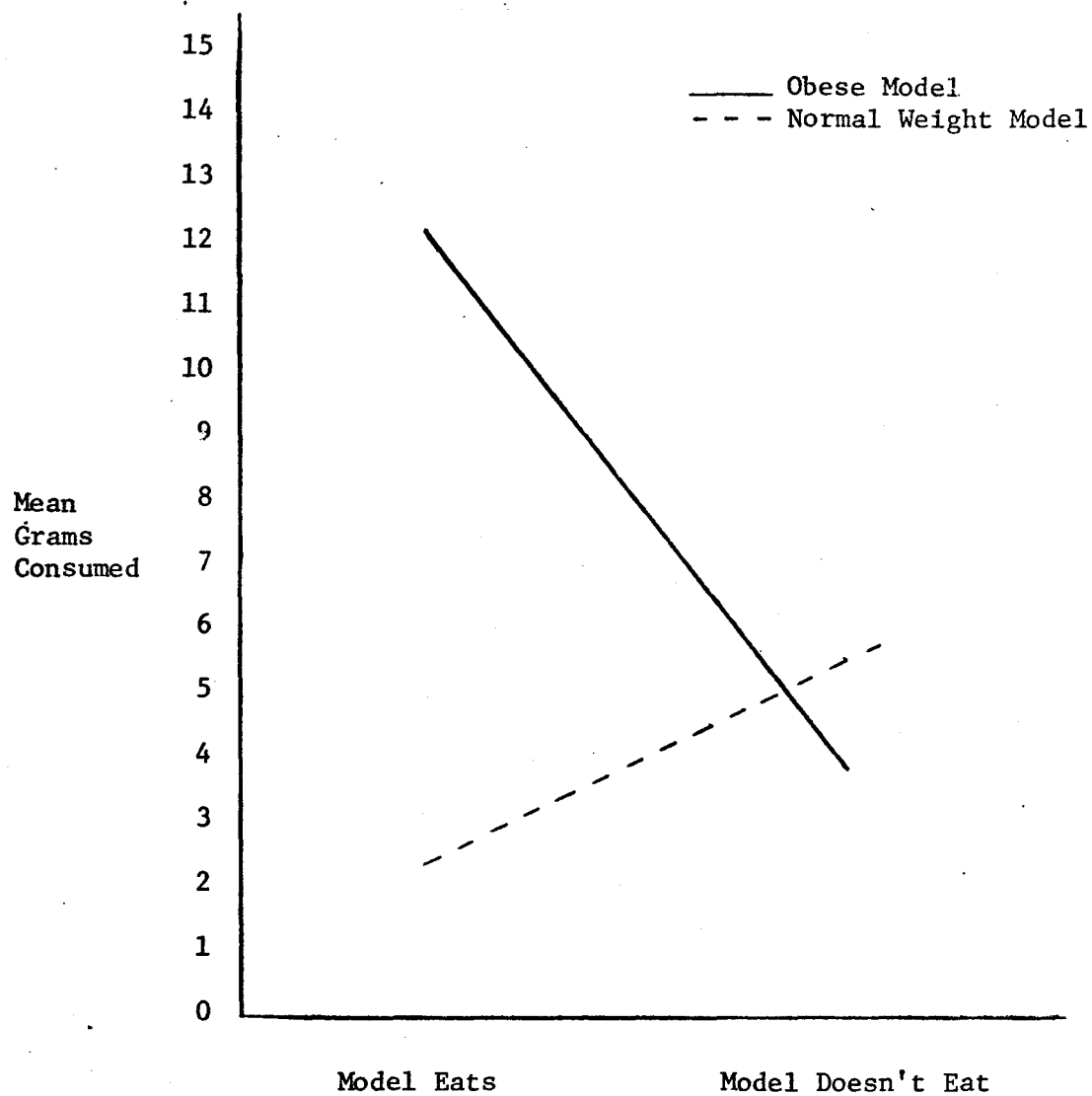


FIGURE 1

Effect of Model Behavior and Model Characteristic
on Food Consumption

test was performed on the four model condition groups. Results revealed that the obese eating model condition was significantly different at the .05 alpha level from each of the other existing model conditions. There were, however, no differences between obese noneating model conditions, normal weight noneating model conditions, and normal weight eating model conditions.

Food Consumption and Weight

It was hypothesized that obese and normal weight individuals do not differ from each other in their food consummatory responses in each of the experimental conditions. Since the height, weight, and age of each of the subjects was not determined until the experiment was completed, it was impossible to foresee that there would be only two obese subjects in the no model condition. The mean amount of grams consumed by the obese subjects in the no model condition was 0 grams as compared to 8.62 grams for normal weight subjects in the no model condition. However, with too few obese subjects no tests could be made comparing the amount of food consumed by obese and normal weight subjects in the absence of a model. The mean amount of grams consumed in the various model conditions by obese subjects (11% or more overweight) and normal weight subjects (10% or less overweight) are presented below: In the normal weight eating model condition obese subjects ($n = 5$) ate an average of 1.62 grams of candy as compared to an average of 2.33 grams for normal weight subjects ($n = 7$). In the obese eating model condition obese subjects ($n = 5$) ate a mean of 12.98 grams whereas normal weight subjects ($n = 7$) ate a mean of

11.06 grams. In the normal weight noneating model conditions obese subjects ($n = 4$) ate an average of 5.13 grams as compared to an average of 5.26 grams for normal weight subjects ($n = 8$). In the obese noneating model condition the mean amount of food consumed by obese subjects ($n = 6$) was .67 grams as compared to 5.87 grams for normal weight subjects ($n = 6$). As with food consumption and restraint, a Bartlett test of homogeneity of variance on these data pertinent to obese and normal weight individuals' eating was also found to be significant ($\chi^2 = 24.54$, $p < .001$), thus again indicating the use of a log transformation of scores. A $2 \times 2 \times 2$ analysis of variance for two levels of weight (obese and normal weight), two model characteristics (obese and normal weight models), and two model behaviors (eat and does not eat) was performed using the transformed scores. As may be seen in Table 2, the main effect of weight and all weight interactions were negligible.

Table 2

Analysis of Variance for Weight, Model Characteristic, and
Model Behavior as Related to Food Consumption

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Weight (W)	1	.10	.10	<1
Model Characteristic (MC)	1	.70	.70	2.81
Model Behavior (MB)	1	.28	.28	1.12
W x MC	1	.15	.15	<1
W x MB	1	.12	.12	<1
MC x MB	1	1.70	1.70	6.80**
W x MC x MB	1	.01	.01	<1
Error	40	9.98	.25	

**p <.025

CHAPTER V

DISCUSSION

The present experiment focused on externality and modeling influences on food consumption in relationship to restraint and weight. Discussion first centers on the issue of externality and then proceeds to the effects of modeling on subjects' eating behavior.

According to Nisbett's relative deprivation model, it was expected that Restrained eaters would do better on an externality task, i.e., immediate recall test, than Unrestrained eaters. However, the data revealed only a trend in the predicted direction. It is suggested that Restrained eaters were not fully attending to the material as they were being somewhat, though not fully, distracted by a salient visual external cue, namely, M & M's candy. Indeed, many individuals when entering the room looked at the candy and it was also observed that some subjects continued to take short glances at it throughout the first phase of the experiment. Moreover, during debriefing a few subjects made comments and asked about the candy, although no subject figured out how the candy was specifically related to the experiment. Past research has shown that the performance of Restrained eaters deteriorates with distraction whereas that of Unrestrained eaters improves with distraction (Herman & Hertz, 1975; Herman, Polivy, Pliner, Threlkeld, & Munic, 1978). In this study it is conceivable that subjects were being distracted, but not as consistently or as totally

as in the experiments cited above where constant distraction was experimentally manipulated on all subjects. If it is the case that subjects were only being periodically distracted, then Restrained eaters may have performed slightly worse and Unrestrained eaters may have performed slightly better than they would have if there was no distraction, thus causing only a trend in the predicted direction. This notion could easily be tested by either replicating the present experiment and asking subjects how distracted they were by the bowl of candy or by repeating the experiment and including a condition where there was no candy available.

As predicted obese and normal weight subjects did not differ in their performances on an externality task. Specifically, on the number of items correctly recalled and on the mean overt errors per slide obese and normal weight individuals did not significantly differ from each other. Yet, an ancillary finding revealed that there was a tendency for obese subjects to do more poorly than normal weight subjects on an externality measure which assessed the ratio of food-related items over nonfood-related items recalled. It is suggested that this trend by the obese to recall proportionately fewer food-related items than normal weight subjects reflected a perceptual defense by these obese subjects against their weight. Further research is necessary to investigate this suggestion. According to Schachter externality is a behavior characteristic of obesity, whereby obese people should perform better on an externality task than normal weight people. Insofar as the results of this study did not

indicate a superior performance by the obese and, in fact, the results pointed toward a poorer performance by the obese on one of the externality measures, Schachter's contention is thus not supported.

It was hypothesized that Restrained eaters in comparison to Unrestrained eaters would restrict their food intake in noneating model conditions and in eating obese model conditions. Moreover, it was hypothesized that Restrained eaters would increase their food intake in eating normal weight model conditions as compared to Unrestrained eaters in eating normal weight model conditions. The failure to lend support to these hypotheses concerned with the differential effects of modeling influences on Restrained and Unrestrained eaters' food consumption is somewhat surprising. It had appeared reasonable to assume that Restrained eaters would be more affected than Unrestrained eaters by other people--what they do and what they look like. In essence, these others would serve as external cues which would break down or strengthen restraint for Restrained eaters, just as external cues like taste and visibility of food do. It is understandable why Unrestrained eaters, as predicted, were not differentially affected by the model manipulations, but why were there no differences between Restrained and Unrestrained eaters in their reactions to obese and normal weight models during periods of model eating or model noneating? One plausible explanation is that social cues, i.e., other people, do not exert the same effects as external cues of a sensory nature, e.g., taste. Nisbett and Storms (1974) found that male obese subjects were no more responsive than nonobese male subjects to social cues

which facilitated or discouraged eating. In fact, all groups of subjects in Nisbett and Storms' (1974) study were greatly affected by a model's behavior, eating more in the Social Facilitation Condition than their counterparts in the Alone Condition, and overweight and normal weight subjects eating less in the Social Suppression Condition than in the Alone Condition. The lack of a difference between Restrained and Unrestrained eaters in their responsiveness to models in this study is consistent with Nisbett and Storms' finding with obese and normal weight subjects.

In retrospect, it seems understandable why Restrained and Unrestrained eaters were not differentially affected by a social cue. All individuals begin to eat in the presence of others at an early age. They all learn what is expected and culturally appropriate in terms of eating behavior. For example, in American society people are taught to use a fork, knife, and spoon and to wipe themselves with a napkin while at the table. Moreover, they learn to eat more or less depending upon the situation and their past experiences with such a situation. In this study subjects may have had some expectations as to the specific demands of the situation, even though the circumstances were relatively unfamiliar to them. Indeed, Restrained and Unrestrained eaters were not significantly different in their eating in the absence of a model. The addition of a model, meanwhile, served as a source of further information in which to guide them and to reassure them as to what was appropriate eating behavior in the context of a psychology experiment.

Yet, the data revealed that model behavior was not, in itself, a factor which motivated subjects to eat more or to eat less. Instead subjects were reacting to both a model's behavior and an attribute of a model, i.e., the model was either obese or normal weight. Specifically, all subjects were being most influenced by the eating behavior of the obese model. They ate more when the obese model ate than when the obese model did not eat, but subjects did not show significant differences in food consumption when the normal weight model ate or did not eat. In fact, subjects consumed the same amounts of candy in the normal weight eating and noneating model conditions as in obese noneating model conditions. It is quite perplexing why subjects responded to the obese model and to the normal weight model the way they did. One possible explanation for the experimental findings is that the two models differed from each other not only on a weight dimension, but also may have differed on various personality characteristics, including persuasibility, friendliness, etc. If subjects in the eating model conditions perceived the obese model as more persuasive and/or as more friendly than the normal weight model, then it would be understandable why subjects imitated the eating behavior of the obese model more than the eating behavior of the normal weight model. Unfortunately in the present experiment no data was collected on subjects' perceptions of their respective models. However, the influence of a model's personality characteristics on subjects' food consumption could easily be tested in a replication study by asking subjects to rate their respective models on various personality

factors or by experimentally varying model characteristics.

An alternative explanation for the outcome of this present experiment is that subjects perceived the obese model as relatively dissimilar (i.e., different from them), but responded more to her eating because her behavior was perceived as being better to imitate. Only two subjects were similar to the obese model in degree of overweight, i.e., 65% overweight or more, so it is conceivable that most subjects perceived the obese model as being somewhat different from them at least on a weight dimension. As for greater imitation of the behavior of a dissimilar model, some evidence has pointed to a greater influence of a dissimilar other. Wheeler and Levine (1967) found that there was a greater contagion of aggressive behavior following exposure to an aggressive, but dissimilar model (i.e., the model was dissimilar to the subject in age, family size, ordinal position in the family, parent's age, home state, hobbies, sports, hometown size, marital status, religion, and race), rather than to an aggressive, but similar model (i.e., the model was similar to the subject on each of the features noted above). In discussing their results, these authors introduced the notion of "unexpected support." Specifically, if a subject feels angry, he/she would expect an individual of similar background to be angry also, while a subject would not necessarily expect an individual of dissimilar background to be angry. The aggression by the similar model then provided very little information to the subject concerning the appropriateness of aggression as a response because the subject expected the similar model to agree with

him/her that aggression was justified. However, aggression by the dissimilar model enhanced the subject's confidence that his/her annoyance and aggression was appropriate because justification for the subject's opinion came from an unexpected direction. Such support from the dissimilar other may be highly effective in that it indicates the belief in question was not dependent upon any particular set of background factors, hence it would indicate the belief was true. In this study exposure to an obese model, supposedly viewed as a dissimilar other, would seem to give subjects a better standard in which to justify their eating because subjects would not expect the obese model to agree with them that eating in this situation was appropriate. Thus, subjects would more likely conform to the obese model's behavior as their confidence in the belief to eat was enhanced by this dissimilar, obese model. The normal weight model, supposedly a similar other, would not greatly enhance the subjects' beliefs that eating was appropriate or not because subjects would expect the normal weight model to agree with them that eating was appropriate. Consequently subjects would not as readily imitate the normal weight model's behavior. To test the effects of model dissimilarity and model behavior on subjects' food consumption, it would seem necessary to manipulate various types of models on a similar population, as well as on different populations. For example, a white female population could be exposed to a black female model or male subjects could be exposed to a female model. Moreover, it would be worthwhile to examine how differences between a model and subjects on other attributes, like

age and nationality, affect subjects' subsequent eating.

The final hypothesis concerned the relationship between weight and food consumption. Although it was not possible (due to too few obese subjects) to test the relationship between degree of overweight and subjects' food consumption in the absence of a model, the weight of subjects was not found to interact with the effects of various model manipulations on food consumption. The findings that obese and normal weight subjects did not differ from each other in food consumption nor in externality as noted earlier, provide additional evidence against Schachter's model. Specifically contrary to Schachter's contention, degree of overweight was not found to be a reliable determinant of eating behavior or behavioral attributes of subjects.

At this point it should be mentioned that Nisbett's relative deprivation model has not been given support as a better model than Schachter's model by the present data. Nevertheless, Nisbett's model has not lost credibility. Relative deprivation is an intriguing idea and a more refined classification of subjects into Restrained (dieters and people presumably below set point) and Unrestrained (nondieters and individuals conceptualized as at or near set point) groups is necessary to rule out or more directly substantiate the notions entertained by Nisbett and his associates. Studies, including this one, should be replicated and implemented for the first time using more direct physiological measures to classify subjects, such as FFA level or use of an index comparing the number of fat cells to actual quantity of body fat.

SUMMARY

The present study was undertaken to compare Schachter's model of obesity with Nisbett's relative deprivation model. Schachter's model implies that weight is the critical determinant of both people's eating behavior and their manifestation of behavioral characteristics of distractibility, externality, hyperemotionality, hypoactivity, and hyposexuality. Nisbett's model, on the other hand, suggests that restraint is the critical determinant of an individual's consummatory and nonconsummatory response pattern. Sixty college age females, classified both by degree of overweight and degree of restraint, were assessed on two dimensions, namely externality and food consumption. No differences were found between obese and normal weight subjects on their performances on an externality task except for a tendency for obese subjects to recall proportionately fewer food-related items.

Moreover, Restrained and Unrestrained eaters were not significantly different in recalling items on the externality task, although there was a trend in the predicted direction with Restrained eaters recalling more items than Unrestrained eaters. In terms of food consumption, results showed that obese and normal weight individuals were not differentially affected by obese and normal weight models who ate or did not eat. Restraint was not found to be a reliable predictor of subjects' food consumption either with Restrained and Unrestrained eaters eating similar amounts of food in no model conditions

and Restrained and Unrestrained eaters not showing significant differences in amounts of food consumed while in the various modeling conditions. Thus, the findings neither supported Schachter's contentions concerning obesity and its behavioral correlates, nor did the results support Nisbett's interpretation of obesity and its corresponding behavioral attributes. The only significant finding was a model characteristic by model behavior interaction with all subjects eating more in the eating obese model condition than in the noneating obese model condition, the eating normal weight model condition, and the noneating normal weight model condition. Possible explanations for this significant interaction were discussed.

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APPENDIX A

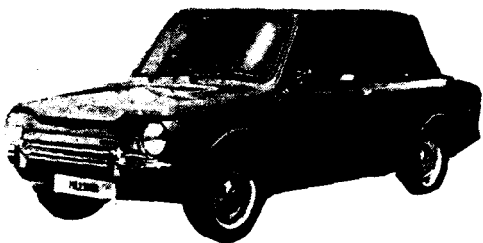
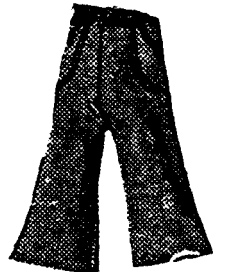
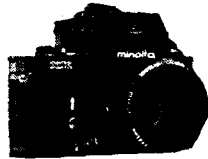
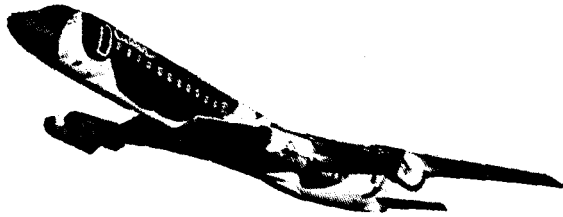
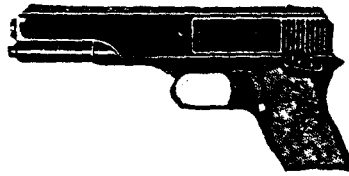
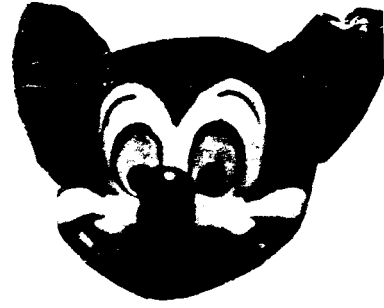
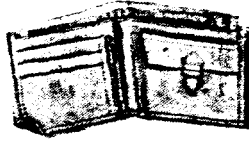
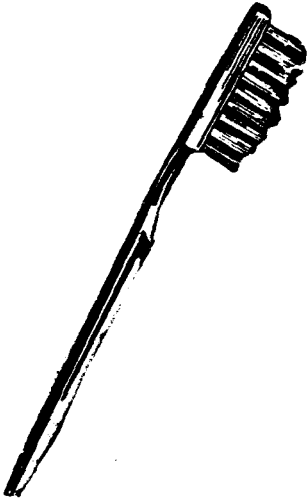
EATING HABITS QUESTIONNAIRE

Name _____ Age _____ Sex _____
 Height _____ Weight _____

The following questions refer to your normal eating pattern and weight fluctuations. Please answer accordingly.

1. How often are you dieting? (Circle one) SCORING 0-4
 Never Rarely Sometimes Usually Always
2. Which best describes your behavior after you have eaten a "not allowed" food while on your diet? (Check most appropriate alternative) SCORING 0-2
 Return to diet _____
 Stop eating for an extended period of time in order to compensate 4
 Continue on a splurge, eating other "not allowed" foods _____
3. What is the maximum amount of weight you have ever lost within one month? 6 SCORING 1 pt./5 lbs.
4. What is your maximum weight gain within a week? 1 SCORING 1 pt./3 lbs.
5. In a typical week, how much does your weight fluctuate (maximum-minimum)? _____ SCORING 1 pt./3 lbs.
6. Would a weight fluctuation of 5 lbs. affect the way you live your life? (Circle one) SCORING 0-3
 Not at all Slightly Moderately Very much
7. Do you eat sensibly in front of others and splurge alone? (Circle one) SCORING 0-3
 Never Rarely Often Always
8. Do you give too much time and thought to food? (Circle one) SCORING 0-3
 Never Rarely Often Always
9. Do you have feelings of guilt after overeating? (Circle one) SCORING 0-3
 Never Rarely Often Always
10. How conscious are you of what you're eating? (Circle one) SCORING 0-3
 Not at all Slightly Moderately Extremely
11. What was your maximum weight ever? _____
12. How many pounds over your desired weight were you at your maximum? _____ SCORING 1 pt./5 lbs.

APPENDIX B



MOVIE

PLANT

LIGHT

DEVIL

ORGAN

PURSE

SCARF

RADIO

MONTH

BRUSH

STONE

CHAIR

HORSE

22

65

99

13

40

26

71

37

58

83

92

39

81

CAKE

BALL

DESK

LUNG

FORK

GOWN

WORD

KNOT

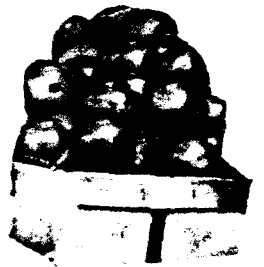
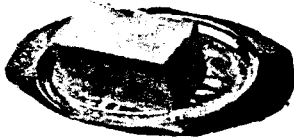
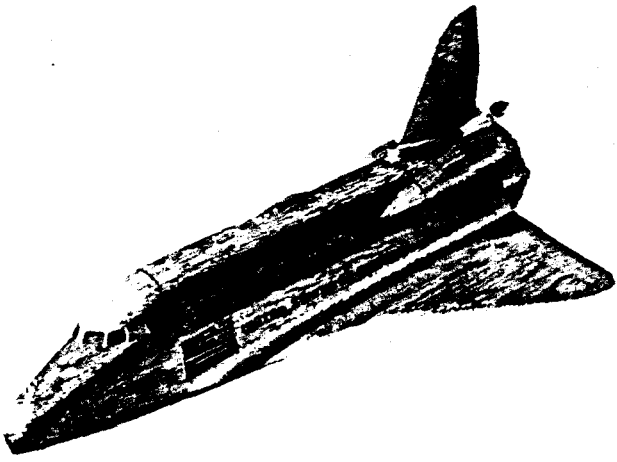
SOUP

MILE

PEAR

YEAR

MEAT



APPENDIX C

- Slide 1 - Black/white pictures
 Slide 2 - 5 letter colored ink words
 Slide 3 - numbers
 Slide 4 - 4 letter words in black ink
 Slide 5 - colored pictures

In order to answer the following questions the type of material on each slide has been identified for you. Please circle one response for each question.

As compared to other people, how well do you think you recalled the information on:

- Slide 1Excellent. . .Good. . .Average. . .Poor. . .Terrible
 Slide 2Excellent. . .Good. . .Average. . .Poor. . .Terrible
 Slide 3Excellent. . .Good. . .Average. . .Poor. . .Terrible
 Slide 4Excellent. . .Good. . .Average. . .Poor. . .Terrible
 Slide 5Excellent. . .Good. . .Average. . .Poor. . .Terrible

Which slide was the least difficult for you in terms of remembering the material presented?

.1. . . .2. . . .3. . . .4. . . .5.

Which slide was the most difficult for you in terms of remembering the material presented?

.1. . . .2. . . .3. . . .4. . . .5.

Briefly explain what attentional process you used for later recall of the information. (i.e., Did you look at all the items on the slides? Did you concentrate on only a few items?, etc.)

Was this same process involved for later recall of the items on each slide? If no, please explain.

(QUESTIONNAIRE continued)

During exposure to picture items did you code the materials into their verbal equivalents, i.e., words?

YES NO

During exposure to word items did you code the materials into their symbolic images, i.e., pictures?

YES NO

Additional Comments:

APPROVAL SHEET

The thesis submitted by Donna Munic has been read and approved by the following committee:

Dr. Thomas Petzel
Associate Professor, Psychology and
Director of Clinical Psychology, Loyola

Dr. James Johnson
Associate Professor, Psychology, Loyola

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

11/14/78
Date

Thomas P. Petzel
Director's Signature