COGNITIVE STYLE AND LOCUS OF CONTROL IN THE OBESE AND THE SMOKER

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ABSTRACT

Results of studies in the area of obesity demonstrated that physiological correlates of food deprivation had little effect on reports of hunger or on eating behaviors - which were largely determined by external factors. In experiments related to non-eating behavior, it has been demonstrated that the obese were more easily swayed by distracting stimuli. Similarly, an examination of previous research in the area of smoking leads to the prediction that these persons are manifesting the same external orientation. The present experiment represents a further attempt to extend the hypothesis about externality in the obese and in the smoker. The effects of obesity and smoking on the distractability, field differentiation and locus of control were tested. It was hypothesized that if obesity and smoking are manifestations of a generalized external orientation, then these Ss would be more distracted by competing cues, exhibit a more field dependent perception and show a more external locus of control orientation than the non-obese and non-smoker. To test these hypothesis 76 Ss who fit the criterion for the obese, the non-obese, the smoker and the non-smoker were tested on distractability, field-differentiation, IE locus of control and Levenson's IPC locus of control. The only statistically significant variable distinguishing the obese from the non-obese was the Embedded Figures Test: here the obese displayed a relative field-dependent orientation. The

implications of this finding with regard to therapy and preventation were discussed.

I. INTRODUCTION

For several years now, obesity has been subject to study and speculation, both by professionals and by laymen. However, despite a concentrated effort to determine why overweight people are so and how to prevent this "disease", no clearcut relation has been yet determined and no cure uncovered. Thus, Stunkard (1958) summed up the situation with the ominous comment: "... most obese persons will not stay in treament for obesity. Of those who stay in treatment most will not lose weight and of those who do lose weight, most will regain it." Since then, a large amount of research has been carried out, both on the etiology and on the treatment of obesity, by medical persons, nutritionists, and more recently by psychologists. Depending on one's professional background, there have been basically three approaches: (a) the examination of physiological variables in obese and non-obese persons, (b) comparisons of the eating behaviors of the these two groups, and (c) a search for personality variables distinguishing the two. In similar fashion, smoking behavior has been examined in regards to etiology and manifestations, and many common features have been uncovered. For example, cognitive styles, personality variables, and physiological effects of eating for the obese and smoking for the smoker have in some ways been found to parallel one another. Furthermore, there seems to be an association between smoking and eating behavior, for quitting smoking is often associated with

weight gain (Hammon and Percy, 1958; Brozek and Keys, 1957). The present experiment[1] investigated this association in terms of similarities between personalities of overweight persons and smokers in terms of internal versus external control of behavior in the setting of previously studied physiological and psychological variables.

OBESITY

A. Physiological

Overweight has been attributed to various genetic and biochemical disorders, being viewed in this approach as a physiological "disease". According to Newburgh (1947) obesity is caused by "an overall intake of energy which has exceeded the total dissipation of energy in the body, i.e. a positive energy body." In a normal person, "food intake is well balanced with energy output as a result of the control of various bodily homeostatic regulatory mechanisms. The urge to eat is a complex phenomenon which has physiological as well as psychological components" - emphasis however, in such research, is on the physiological (Kaplan and Kaplan, 1957). The point of focus in physiological research, then, is why do obese persons fail to respond in a "normal" manner to hunger and satiation cues. Kaplan and Kaplan (1957)

[1] While much depends on the definition of obesity, in this paper the term was operationally defined as having a body weight of at least 10% over that suggested to be normal by the Metropolitan Life Insurance Company (MLC, 1959) standards. A smoker was defined as one who, by self report has smoked an average of 10 or more cigarettes a day for at least the past year.

discussed the role of various metabolic deficiencies, endocrine disturbances, neurological lesions, and diseases of the pituitary gland, thyroid gland, pancreas, adrenal cortex, and gonads, unfortunately these account for only about 3% of the total cases of obesity! Newburgh (1947) noted that obesity is never directly produced by an increase or decrease in the activity of an endocrine gland, but rather by overeating caused by a disturbance in the appetite originating in endogenous sources. Rony (1940) concludes that there is "no consistent evidence of any specific disturbance in the intermediary metabolism of fat that could be regarded as a major cause of obesity." Watts (1935) has cited various cortical disturbances acting through the hypothalamus as the etiological basis of obesity. Mayer (1968) indicates several physiochemical imbalances as determinants. Penick and Stunkard (1970) explained that the number of cells in adipose tissue is determined early in life, and changes in weight are due to changes in size rather than number of cells, therefore those with juvenile onset of obesity are more resistant to weight loss and more susceptible to weight gain than those with normal-weight in childhood. Gordon (1969) has suggested that arteriosclerosis, coronary heart disease, diabetes, hypertension, and gall bladder disease, though customarily regarded as complications of obesity, may in fact "occur, along with obesity, as a constellation of disease processes caused

primarily as genetically transmitted abnormalities." He furthermore suggests the strong probability that obesity is not a single, homogeneous clinical entity, but rather a group of conditions with differentiating characteristics.

More recently, Nisbett (1972), in reviewing the literature on obesity, has noted striking behavioral parallels between obese individuals and hungry persons, suggesting the possibility of many obese persons actually being in a chronic state of energy deficit, and genuinely hungry, perhaps due to an attempt to hold their weight below its "biologically dictated 'set point'." He suggests that hypothalamic centres defend different baselines of adipose tissue in different individuals, maintaining whatever set point has been established by heredity and by nutritional conditions during the critical juvenile period. However, Stunkard (1959) noted that 71% of his subjects (of normal weight) expressed the experience of hunger when stomach contractions (a physiological concommitant of hunger) were present while overweight Ss rarely expressed hunger, whether stomach contractions were present or not. This denial of hunger may be the lack of awareness of hunger either from the misinterpretation of hunger feelings or from actually not feeling hungry.

B. Eating Behavior

Recent research in psychology has indicated that, although animals eat and work to eat when they are food

deprived, for the obese, food deprivation or satiation does not greatly influence either self reports of hunger or actual eating behavior. Rather, it is the situational variables which appear to have a greater control over eating habits of the overweight. Stunkard (1959) noted two syndromes typical of overweight women: night-eating, and "binge" eating followed by severe discomfort and expressions of self-condemnation. "Binges" occurred most frequently after periods of suppressed anger. Simon (1963) suggested that obesity is a depressive equivalent, that eating was to ward off and allay depressive feelings. He supported this hypothesis by comparing the incidence of clinical depression in overweight and normal weight persons, finding significantly more depressed people in the normal group. But in his work one is bound to wonder about what is cause and what is effect.

The difference between hunger and appetite has been stressed by several researchers. Hamburger (1951) explains that "Hunger is the physiological expressions of the body's need for energy (food) which operates involuntarily in the healthy individual ... under the control of inherited, constitutional or hypothalamic regulation ... Appetite, on the other hand, is a psychological desire to eat and gives a distinct anticipatory pleasure. Normally hunger produces appetite, but appetite also exists independently and can be stimulated by other means ... " - often non-physiological. Hamburger studied 18 obese patients and found that their

appetites were not due to hunger per se, but rather emotional stress. Similarily, Wooley (1971), by feeding both normal weight and obese subjects on nothing but liquid, found that while both groups reported hunger, the obese Ss tended more than normals to report hunger when the sight and smell of other foods were available. It seems that the appetite of the overweight is stimulated by more external stimuli rather than by internal physiological hunger.

Along these lines, Schachter investigated differences in eating patterns between overweight and normal Ss (Schachter, 1967, 1968, 1971; Schachter, Goldman and Gordon, 1968; Schachter and Gross, 1968; Goldman, Jaffa and Schachter, 1968). Specifically, he was interested in the cognitive effects on eating behavior of the obese. His research challenges assumptions about the universal importance of physiological deprivation states for behavior. Schachter, Goldman and Gordon (1968) found that when normal weight Ss were actually food deprived, they ate far more than when they were full; by contrast, overweight Ss ate slightly more when they were sated than when they were food deprived. These results suggested that the eating behavior of the obese is not under internal, physiological regulation. Whether or not the overweight individual eats seems unrelated to his actual state of physiological need.

The obese individual's appetite does seem greatly stimulated by external, food-related cues. Obese Ss ate more

when they thought the time was 6:05 than when they thought it was 5:05, even though in fact it was the same hour of the day (Schachter and Gross, 1968). In an investigation of fasting practises during Yom Kippur, it was found that more overweight than normal Jews reported fasting the whole time. However, overweight persons who spent less time in Synogogue found fasting more difficult than normals. When a time change due to long distance travel took place, the obese ate more often at the "proper" clock time, while normals (in weight) ate according to hours from the previous meal (Goldman, Jaffa and Schachter, 1968): again the dependence of the obese on external cues seems manifested. Nisbett (1968) manipulated the taste of ice cream, using food deprived and "full" Ss of both normal weight and overweight. He found that obese Ss ate either very small or very large amounts and that they ate more ice cream than normal weight Ss only when they liked it. When an effort was required to obtain food, obese Ss ate less then normal Ss (Schachter, 1962). Under conditions of emotional arousal, the obese eat more than they normally do and more than their normal weight counterparts (Conrad, 1969; McKenna, 1971; Schachter, Holland, Hasley and Copling, 1970). There appears, then, to be little question that the obese do not label as "hunger" the same set of bodily symptoms as do normals. Whether gastric motility is measured or manipulated, there is a degree of correspondence between the physiological state of the stomach and the eating

behavior of normals, but virtually none for the fats. The question, then, is what is it in the obese which causes their appetite to be determined more by external than internal cues?

C. Personality

While Schachter feels that the internal state is irrelevant in determining eating behavior of the obese, the third position, examining overeating as a psychosomatic activity, suggests that various psychological characteristics precipitate eating in the obese. Bruch (1961), approaching the problem from an analytical point of view, suggests that overeating is due to an overprotected childhood, where the child is fed when mother thinks he should be, rather than when he is feeling hungry. "The outcome of such incorrect learning is the inability to recognize distinctly the need to eat, to recognize hunger and its satiation and to differentiate hunger from signals of body discomfort which have nothing whatsoever to do with the nutritional state of hunger." Conceivably then, feeding a child by a time schedule could lend itself to obesity! "Hebb feels that the non-nutrional aspects of our desire for food are so familiar that they are often forgotten, because they do not fit into the concept of hunger as an innate drive, or of an alternate sensation to the physiological signs of food deprivation." The person Bruch describes sounds very much like Stunkard's and Schachter's obese personalities. With the addition that,

"there is an overall lack of awareness of living one's own life, a conviction of the ineffectiveness of all efforts and strivings". This also suggests Witkin's field-dependent person, who judges bodily feeling of uprightness according to external visual cues rather than internal feelings (Witkin and Oltonan, 1967). Karp and Pardes (1965) did find that obese women were more field dependent than normals, however, these were women attending a clinic, who had sought outside help to lose weight and may consequently represent a selective sample. Schachter (1972) was unable to replicate their findings among overweight college students.

Further efforts have been extended to find non-eating-related personality characteristics typical of overweight persons. Kaplan and Kaplan (1957) pointed to a learned anxiety-avoidance response as a cause of overeating. Suzeck (1959) administered MMPI and TAT to a group of obese women and found an extreme emphasis on psychologic strength, "hypernormality", narcissistic pride and denial of weakness to be typical of these women. They were threatened by passivity in others and tended to handle anxiety by externalizing. Obesity is inversely related to social class (Penick and Shunkard, 1970). Obese Ss generally come from families where the amount of money spent for food is disproportionally large in relation to the amount spent on other items (Burdon and Paul, 1951).

Along the line of internal-external control of

behavior, Pliner (1973a, 1973b) found that the thinking behavior of obese Ss is externally controlled to a greater extent than that of normals and that body weight and cure salience interacted in determining responsiveness to external cues. It does seem possible, then, that the obese may be highly responsive to a variety of potent external cues, only one subset of which is food related.

SMOKING

A less examined but equally controversial issue is the causes of smoking. Though researchers have concentrated mainly on the detrimental effects of smoking to health in an effort to convince people to quit, some research has been carried out on the personalities of smokers versus non-smokers. Explanations suggested for the starting and continuing of habitual smoking range from psychological to social to physiological causes and as with overweight, is highly resistant to treatment: "After six years of intensified research on cigarette-smoking behavior, preceded by decades of less feverish efforts, very little useful knowledge has been contributed beyond the rather elementary observations that smoking behavior is widespread and likely to become more so, that it is probably unsafe, and that is is incredibly resistant to long-term modification" (Bernstein, 1969).

There are other striking similarities between the smoker and the obese individual. Matarazzo and Saslow (1960), in reviewing the literature on psychological, personal, social

and situational characteristics of smokers and non-smokers, note that like obesity, smoking is greater among working classmen while non-smoking is predominant in the middle class. Adolescent boys who smoked on the average gained more weight, participated more in sports (a sociable activity) and had higher anxiety scores on the Taylor Manifest Anxiety Scale (Taylor, 1953). Indeed, Eysenck (1960) suggests that like eating for the obese, cigarette smoking has an anxiety reducing effect for the smoker. Eysenck found that smokers were significantly more extroverted than non-smokers, suggesting to him a genotype with both the tendency to smoke and the tendency to contract cancer: he holds the view of correlation rather than causation.

In an effort to test the similarity between smoking behavior for the smoker and eating behavior of the obese, Herman (1973) carried out an experiment on smoking analagous to Schachters' (1967, 1968, 1971) on eating. Using cigarette deprivation as the internal cue and cigarette cue prominence as the external cue, he found that for heavy smokers, who reported smoking 20 cigarettes or more per day, internal cues were of major importance (whereas in eating the opposite result was obtained). For light smokers (smoking 15 or less per day) both external and internal cues were influential. This does little to further the hypothesis that smoking and overeating are similar psychosomatic behaviors. Weight and smoking behavior do appear to covary. Brozek and Keys (1957)

found significant weight increases in men who quit smoking over two years, while non-smokers and (ultimate) non-quitters did not gain significantly. Hammond and Percy (1958) polled 3,560 men, 70% of whom had been reported to be regular smokers at some point in their life. Of the 333 men who had quit smoking 246 (73.9%) said that they gained weight. However, when the increase occurred, or how permanent these weight gains were is not made clear.

Along the internal-external dimensions, smokers have been examined on perceived locus of control with mixed findings. Straites and Sechrest (1963) and James, Woodruff and Werner (1965), found smokers to be more E than non-smokers, while Hjelle and Clouser (1965) found no IE differences corresponding with smoking behavior. However, the different results are likely due to variables such as length of follow-up, intensity of initial smoking, age, etc., and consequently no conclusions can be drawn. Nesbitt (1973) noted an apparent contradiction in that smokers report smoking to relax but physiologically it presents a stimulus. Using smokers and non-smokers in an experiment with various strengths of cigarettes (as determined by amount of nicotine content), and using receipt of shock for a stress situation, Nesbitt found that when both groups of Ss were smoking the smokers actually behaved less emotionally than non-smokers and conversely when not smoking, smokers behaved more emotionally than non-smokers (emotionality was measured by ability to endure shocks: the greater intensity tolerated, the less emotionality S was said to be manifesting). It

seems in this study, parallel to those of Schachter, smokers (like the obese individual) are more sensitive to the external cue of the cigarette than to the internal cues of physiological arousal, while non-smokers are more respondent to physiological states.

Given then the ambiguity of conclusions, the present experiment is designed to test the implication that smoking and overeating are both manifestations of a general external control orientation.

THE PRESENT EXPERIMENT

A. Distractibility

Basically, what the research indicates about eating habits of the obese, and smoking behavior of the smoker, is that these behaviors are stimulus bound. This finding would lead, and has led, to the prediction that in the obese a food relevant cue - even a remote one - is more likely to evoke an eating response than in normals and the same applies to smokers. If then the stimulus-bound hypothesis extends to non-eating, non-smoking cues and their related behaviors, then any prominent stimulus is more likely to evoke a response in the obese and in the smoker than in the normal. If this is true, one would expect that the obese and the smoker, while performing tasks requiring concentration, would be more easily distracted by competing cues than normals. A sway of attention (distractibility) is expected to be greater for these Ss because it is

predicted that all salient external stimuli catch their attention and response. To test the distraction hypothesis, a version of the Stroop test was used (Stroop, 1935,1938). Comalli, Wapner and Werner (1962), suggest that "performance on the Stroop reflects the capacity to maintain a course of action in the face of intrusion by other stimuli." While performance on this task can be situationally effected, by such variables as stress, age, drug states and internal motivational state, there have also been personality and cognitive style differences found between low interference prone and high interference prone Ss (Klein, 1964; Boverman and Lazarus, 1958; Comalli, Wapner and Werner, 1962: Hochman, 1967; Jensenand, Rohwer, 1965). The task is based on the idea that work reading has a stronger response bias than color naming, so that when words are printed in colored ink, the stronger tendency is to read the word rather than the name of the ink color used. Thus, when the task is to name the color of the printed term, the word becomes a strong competing stimulus. The theory behind this is that adults, while they do not react to every object or color they see by naming it, at least a covert verbal response in the act of recognition of printed words. Consequently, the habit for responding verbally to printed words becomes stronger than the habit of verbally responding to colors (Jensen & Rohwer, 1964). As the word becomes more closely associated to the color

(i.e. the name of a color itself), the competition increases (Hochman, 1967). For the obese person and the smoker, who presumably are more susceptable to attending to salient cues, one would expect little distraction from neutral words, but greater distraction from words which are themselves color names: e.g. if the word "red" is printed in green then the response competition is higher than if the word "run" is printed in green ink.

B. Psychological Differentation

Psychological differentation, a dimension of personality structure identified by Witkins and his colleagues (Witkin et al., 1954; Witkin and Oltman, 1967), refers to the developmental phenomenon reflecting the articulation and structuring of experience of the self and the environment. The extent of differentiation is reflected in the area of perception in degree of field dependence or independence. A field-independent reaction is a perception in which an item remains discrete from the field of which it is an organized part. In a field-dependent mode of reacting, perception is dominated by the overall organization of the field; there is a relative inability to perceive parts of the field as discrete. Thus, a person who is relatively field independent exhibits a differentiated mode of functioning, while the field-dependent person demonstrates a more global approach. Here external cues have a powerful overriding effect on internal body sensations. In general,

the field-dependent person has a limited sense of separate identity. The smoker and the obese S, who are more effected by the external cues of the cigarettes and food than by physiological cues seem to fit the field dependent description. The present hypothesis is that smokers and obese Ss will be significantly more field-dependent than non-smokers and Ss of normal weight. The present experiment tested this hypothesis via the Embedded Figures Test (EFT; Witkin, et al., 1971). In this test, the S is required to find a simple form within a more complex design, which theoretically requires differentiation of a part from the whole. The longer the time required to find the simple form, the more field dependent (less differentiated) the S is said to be.

C. Perceived Locus of Control

Rotter (1966) has developed a theory of social learning involving the perception of cause and effect as it varies from individual to individual. Based on traditional reinforcement theory, Rotter adds that, "The effect of a reinforcement following some behavior on the part of a human subject, in other words, is not a simple stamping-in process but depends upon whether or not the person perceives a casual relationship between his own behavior and the reward." Thus, a person may feel that his own actions caused that reinforcement to occur. The former is considered to be a belief in "external control", the latter a belief in " internal control". While the belief may vary from