

COGNITIVE STYLE AND LOCUS OF CONTROL

IN THE OBESE AND THE SMOKER

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Ann Charlotte Gerson

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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 prevention 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 treatment 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<sup>(1)</sup> 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 concomitant 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. Similarly, 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 Synagogue 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 than 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-nutritional 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 it 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 word 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 susceptible 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 Differentiation

Psychological differentiation, 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



situation to situation, there are also consistent individual differences in the degree to which one is likely to attribute personal (internal) versus external control to the same situation.

Internal-external (IE) locus of control orientation has been examined via Rotter's (1966) scale. It has been related to such things as psychopathology, political activism, risk taking, conformity, learning achievement, etc. The I of IE can be viewed as assumption of responsibility for behavior and its consequences, (Phares, Ritchie and Davis, 1968), while the belief in an external locus of control "could be a method of evading the responsibility for anticipated negative reinforcements.", (Phares et al., 1968) This sounds remarkably like Bruch's description of the overweight person who has not learned to get his reinforcers via his own actions (i.e. eating when hungry to dissipate hunger pangs), but instead to be fed by another and as a consequence seeing no personal control (I factor). The present hypothesis is that the obese person will be more externally oriented. For the smoker, the fact that despite repeated evidence of a cancer-smoking link he or she continues with the activity also suggests an external chance oriented view.

The hypothesis of the present experiment will be measured via Rotter's IE Scale (Appendix A). The concept of IE locus of control has been criticized by several

researchers as being too heterogeneous (Levenson, 1973; Kleiber, Veldman, and Menaker, 1973) and as a result a new scale has been developed, which divides the classification of external into "powerful others" and "chance" (Levenson, 1972). Guilford (1966) stated that: "From the findings regarding dissonance theory as applied to smoking behavior, we are forced to draw the conclusion that there are a great many smokers tolerating a large degree of dissonance." However, dissonance is reduced when the S holds a belief in chance events and denies that his smoking or not smoking will cause or prevent cancer. Levenson (1972) reasoned that there is a difference between persons who believe the world to be unordered, with reinforcement on a chance basis, and those who believe it to be ordered, but with "powerful others" in control of the reinforcers. It was decided to examine the overweight and the smoker within this finer distinction as well, the hypothesis being that smokers would be significantly higher than non-smokers on the chance variable, with both the obese and the smoker higher on powerful others. This would be measured utilizing Levenson's IPC scale (Appendix B) a modified version of the Rotter IE.

#### EXPERIMENTAL HYPOTHESIS

Based on what we already know of the behavior of the obese and the smoker, we would expect them to have a generalized "external" orientation. In terms of the measures used, this would generate:

Hypothesis I: Using a low interference (LI) task based on the Stroop color-word test, it was predicted that there would be no differences between the obese, the smoker and their respective "normals". There will be an overall increase in errors on the high interference (HI) task over the LI task. With the HI task, the obese was expected to exhibit greater distractability than the non-obese, and the smoker more than the non-smoker.

Hypothesis II: Using the EFT to measure psychological differentiation, it was predicted that the obese would be relatively more field-dependent than the normal and the smoke

Hypothesis III: Using Rotter's IE<sup>(2)</sup> scale, the smokers were expected to be more external (E) than the non-smokers, the obese more E than the non-obese.

Hypothesis IV: On the internal (I) scale of Levinson's IPC<sup>(3)</sup> normal-weight Ss were expected to score higher than obese Ss, with non-smokers scoring higher than smokers.

Hypothesis V: The powerful others (P) scale of the IPC was predicted to yield highest scores for the smoker and the obese relative to their norms.

(2) Rotter's IE scale is a forced-choice scale, each item consisting of 2 possible responses: one an I response, the other an E response. A high score represents an E orientation, with a lower score representing a more I orientation.

(3) The Levenson test consists of three independent scales: I, P, and C. Each scale consists of eight items with a Likert scale (strongly disagree to strongly agree). A high I score represents a strong orientation. However, a low I score does not necessarily represent an E orientation. Theoretically, with Levenson's tests, it is possible to score high on both the I scale and on the two E scales (C and P).

Hypothesis VI: On the chance (C) scale of the IPC, smokers were expected to score high relative to their non-smoking counterparts. Correlations among the dependent variables will also be examined.

## II. METHODS

### Subjects

Eighty-four introductory Psychology students participated as Ss in the experiment. Data on the weights, heights and smoking behavior of potential Ss were obtained via a questionnaire (see Appendix C) circulated to introductory psychology classes. From these data, the percent overweight of each student was determined, using the Metropolitan Life Insurance Company (MLIC, 1959) norms (see Appendix B). The mean value for "medium" frame was utilized to determine standard weight. Following the practise established in previous studies and outlined by Schachter, Goldman and Gordon (1968), a S was considered obese if he or she was at least 10% overweight according to these standards. Normal weight Ss were no more than 7.5% overweight. All Ss were weighed at the end of the experimental session and 5 of 84 were eliminated from consideration because their weights fell between the designated normal and obese cutoff points, while 3 were eliminated due to color-blindness (in as much as normal color vision was required for the Stroop color-word and the EFT tests). The remaining 76 Ss provided data for the experiment. The weight deviation of the obese group ranged from 10.5% overweight to 60.9%, while normals ranged from -23.9% to 7.3%. A smoker was defined as one who reported having smoked, on the average, 10 cigarettes or more per day for at least one year. A non-smoker was one who had never smoked

TABLE I

Experimentally Relevant Characteristics of Subjects

<u>Condition</u>	<u>Average Daily Cigarette Consumption</u>	<u>Mean Height in Inches</u>	<u>Mean Weight in Pounds</u>	<u>Mean Percent Weight Deviation</u>
Non-smokers				
Obese	0.0	67.1	172.6	24.4
Smokers				
Obese	17.2	67.0	181.4	21.9
Non-smokers				
Non-obese	0.0	66.7	133.6	-2.4
Smokers				
Non-obese	20.5	68.3	137.6	-4.2
All				
Obese	N.R.	67.0	177.0	23.2
All				
Non-obese	N.R.	67.5	135.6	-3.2
All				
Smokers	18.8	N.R.	159.5	N.R.
All				
Non-Smokers	0.0	N.R.	153.1	N.R.

(n = 19 per cell, smoking x weight condition)

N.R. = not relevant

more than an average of two cigarettes per day by self-report. The average daily consumption reported by smokers ranged from 10 to 45 cigarettes per day, with all the non-smokers reporting no cigarette consumption. The experimentally relevant S characteristics for all Ss included in the analysis are provided in Table I. Obese Ss were, on the average, 41 pounds heavier than their normal weight counterparts. Thirty-eight obese, 19 of whom were smokers and 19 non-smokers, served as Ss with 38 normal-weight Ss (19 smokers, 19 non-smokers).

#### Materials

For the distractability hypothesis, a modified version of the Stroop color-word test was utilized, based on Hochman's (1967) method of presentation of the stimuli. Two lists of words, each printed in either red, blue, green, gold or black were used. In the LI list, the words were common English verbs associated with color names (e.g. put, run, etc). For the HI list, the words were the same as the ink color names (red, blue, etc.) but presented in incongruent combinations of colors and words (e.g. "black" printed in red ink, etc.) (see Appendix E). Each word-color combination (20 in each list) was printed in Letraset on a 3 x 5 inch card and photographed onto color slides. A practise series of 12 slides was utilized. Slides were arranged so that no word nor color of ink immediately succeeded itself. The slides were presented by a Kodak Carousel Projector attached to a Hunter Timer which presented a slide every .5 second. Answers

were recorded on a response sheet.

For the field differentiation hypothesis, the Witkin EFT (1971) was used. This consists of 12 colored designs and eight simple forms printed on white cards. Times to solution were recorded.

The locus of control hypothesis required the use of the Rotter IE Scale (1966) and the Levenson IPC scale (1973). The former is a 26 item forced-choice scale, which yields a score which is more I at the low end and more E at the high end of the range of possible scores. The Levenson scale consists of 24 items responded to via a Likert-type scale, where the S is asked to rate statements "strongly disagree" to "strongly agree", with a range of six possible responses. This test yields three independent scores: I, P and C. Balance scales for weighing and measuring Ss heights and the questionnaires (Appendix C and F) were used. Reliabilities may be seen in Appendix G.

#### Procedures

When each S arrived in the experimental room, he or she was first administered the EFT as per instructions in the manual (Witkin et al, 1971). Following this, the Stroop color-word test was administered. For this, Ss were moved to another chair facing a small screen onto which slides were projected. Ss were instructed as follows: "You will be shown some slides of words printed in different colors of ink. I would like you, as each word appears on the screen, to call out the color of ink in which the word



is printed as quickly as possible. The only colours used will be green, red, blue, black and gold". Samples of each color were shown and a practise trial of 12 words was held. Responses were recorded as either correct or incorrect. The trial-sets were presented in the following order: (a) practise trial-set, (b) LI trial-set, (c) HI trial-set, with a pause of approximately 15 seconds between trial-sets. Following the Stroop color-word test, Ss were taken to another room where they were asked to fill out the IE, the IPC and a questionnaire (Appendix III) and weight and height (without shoes) were measured. The total amount of time taken per S was approximately 45 minutes.

### III. RESULTS

#### A. Distractability

Hypothesis I was examined statistically by means of a 2 x 2 x 2 repeated measure analysis of variance, with two levels of weight (obese and normal weight), two smoking conditions (smoker and non-smoker) and two degrees of distraction (LI and HI). The interference (distraction) factor was a repeated measure within Ss and the dependent measure was the number of words missed of 60 in the list. The hypothesis predicted a significant weight x interference effect and smoking x interference effect.

Table 2 demonstrates the mean number of errors for each S group and list. The analysis of variance shows a main effect due to the list used, with  $F(1,72) = 76.81$ ;  $P < .0001$ . The direction was toward a greater number of errors in the HI condition than in the LI condition. Table 3 gives a summary of the analysis for hypothesis I. No other effect was significant beyond the .05 level per hypothesis.

#### B. Psychological Differentiation

Hypothesis II was tested utilizing a 2 x 2 analysis of variance (weight x smoking condition). Table 4 shows the mean times to solution of the EFT figures for the S groups. The analysis shows a significant effect due to weight conditions ( $F(1,72) = 5.82$ ;  $P < .02$ ): as predicted the obese performed more poorly on the EFT, indicating field dependent orientation. No significant effect due to smoking

TABLE 2

Means and Standard Deviations of Number of Errors on the Stroop Color-Word Test as a Function of Subject Conditions: Low Interference and High Interference Lists

Low Interference

Obese

Non-Obese

Smoker

Mean	3.31	4.00
S.D.	5.23	9.89

Non-Smoker

Mean	1.21	2.31
S.D.	2.20	3.53

High Interference

Obese

Non-Obese

Smoker

Mean	13.63	10.63
S.D.	10.33	10.26

Non-Smoker

Mean	8.15	10.31
S.D.	8.33	8.91

TABLE 3

Dependent Variable: Words missed on the  
Stroop color-word  
test

Summary of 2 x 2 x 2 Split Plot Analysis of Variance:  
Smoking Condition, Weight Level and Degree of  
Interference with Interference as a Repeated Measure

Source	df	MS	F	P
Weight	1	2.12	0.02	0.88
Smoking	1	217.91	2.37	0.13
Weight x Smoking	1	73.92	0.80	0.37
Between Subjects	72	92.11		
List	1	2415.98	76.81	0.00
List x Weight	1	16.45	0.52	0.47
List x Smoking	1	9.49	0.30	0.58
List x Weight x Smoking	1	53.29	1.69	0.19
With Subjects	72	3.145		
Total	151			

TABLE 4

Means and Standard Deviations of Time  
to Solution on EFT as a Function of Subject  
Conditions

		Obese	Non-Obese
Smoker	Mean	53.76	45.56
	S.D.	29.53	21.81
Non-Smoker	Mean	51.86	33.28
	S.D.	27.97	14.45

occurred. Table 5 summarizes the analysis for Hypothesis II.

C. Internal-External Locus of Control

Hypothesis III concerning Rotter's IE locus of control was tested via a 2 x 2 analysis of variance (weight by smoking condition), with a relatively high score indicating a more external orientation. (To support the hypothesis, significant effects for the smoking condition and the obese condition were required). Table 6 gives the mean IE scores for each cell. As is evident from this, no IE effect due to subject conditions is found.

D. Internal, Powerful Other and Chance Locus of Control

Hypothesis IV concerned the I scale of the Levenson IPC test, while Hypothesis V and VI made predictions concerning the P and C scales respectively. Each of the three components of the IPC test was analyzed by utilizing a 2 x 2 analysis of variance (weight x smoking conditions), with I, P and C scores respectively as the dependent variables. (Support of Hypothesis IV required significantly higher average I score for the non-smoking and non-obese groups as compared to their respective norms, i.e. the smoker and the obese.) Table 7 gives the mean I score for the experimental groups. No significant effects were found.

Hypothesis V was similarly analyzed with Ss' P scores

TABLE 5

Dependent Variable: Average Time to Solution on EFT

Summary of 2 x 2 Analysis of Variance: Smoking  
Condition and Weight Level

Source	df	MS	F	P
Weight	1	3406.14	5.8249	.02
Smoking	1	952.89	1.6296	.20
Smoking x Weight	1	511.62	0.8749	.35
Within Cells	72	584.75		
Total	75			

TABLE 6

Mean Rotter IE Scores and Standard  
Deviations as a Function of Subject Conditions

	Obese	Non-Obese	
Smoker	Mean	8.53	9.94
	S.D.	5.43	3.24
Non-Smoker	Mean	9.57	11.21
	S.D.	4.83	4.18



TABLE 7

Mean Internal Locus of Control (I) Score of the  
Levenson IPC Test as a Function of Subject Conditions

		Obese	Non-Obese
Smoker	Mean	36.78	38.47
	S.D.	7.98	7.20
Non-Smoker	Mean	32.10	35.84
	S.D.	9.61	9.15

as the dependent variable. No significant differences were obtained. Table 8 shows the means and standard deviations of the subject cells.

For Hypothesis VI, a 2 x 2 analysis of variance (weight x smoking) with C scores as the dependent variable also failed to show support (Table 9).

E. Correlations Among Dependent Variables

Pearson-product moment correlations were calculated among the dependent variables. The results, summarized in Table 10, tend to support Levenson's contention that the P (powerful other) component of Rotter's IE scale is a contaminant of the external end of the dimension. This is seen by the fact that the I and P correlation is - 0.18 ( $P < 0.06$ ), while the I-C correlation is -0.35, with  $P < 0.001$ . Another interesting finding is a negative correlation between I score and the EFT (-0.23), suggesting a possible correspondence between perceived internal control and actual internal cueing in problem solving.

TABLE 8

Means and Standard Deviations of  
Powerful Other Orientation (P) Scores as a  
Function of Subject Conditions

		Obese	Non-Obese
Smoker	Mean	15.42	18.00
	S.D.	6.20	9.61
Non-Smoker	Mean	16.89	20.36
	S.D.	7.09	6.51

TABLE 9

Means and Standard Deviations of  
Chance Orientation (C) Scores from Levenson's  
IPC Locus of Control Test as a Function  
of Subject Conditions

		Obese	Non-Obese
Smoker	Mean	14.47	16.00
	S.D.	6.43	7.52
Non-Smoker	Mean	16.10	17.89
	S.D.	7.13	6.40



#### IV. DISCUSSION

This study was designed to test the implication that overeating and smoking, as stimulus-bound activities, are part of a generalized stimulus-bound (external) orientation. This formulation would predict that, on measures purporting to differentiate "internal" from "external" orientations, the obese and the smoker would exhibit greater externality, while their normal weight and non-smoking counterparts would exhibit greater internality. Ss, selected on a given though arbitrary definition of smoking and obesity, were tested on two self-report scales (IE and IPC locus of control) and two measures requiring skill and concentration (the Stroop color-word test and the EFT). It was found that there was a statistically significant tendency for the obese to show an external field-dependent orientation on the EFT.

The hypothesis that smokers and the obese would be more distractable than normals was not supported using the Stroop color-word test. While the high interference (HI) list was significantly more distracting than the low interference (LI) list, performance between groups did not vary significantly. A possible explanation for this finding is that, while the task is clearly a competitive one (competitive on the stimulus side), it is also one which requires only momentary concentration, whereas previous studies on the obese had required longer periods of concentration (Pliner, 1973a, 1973b; Rodin, 1971).

The data on field differentiation (Witkin, 1971) did

lend partial support to the second hypothesis in as much as a greater field dependence for the obese is indicated. A question one might have is, which came first: the obesity or the field dependence, or are they both manifestations of a third factor? Bruch's (1961, 1973) theory attributes this to a child rearing practise which causes a child to be totally dependent and also prevents the child from becoming sensitive to proprioceptive cues. Consequently, not feeling hunger and not knowing from inner cues the appropriate times to eat represent aspects of a much larger situation of general insensitivity to internal cues and a willingness to accept external manipulation. While her theory is based on clinical observation rather than experimental manipulation, it does have some support from the present data, in that obesity seems to go along with a general field-dependent orientation. Alternatively, field-dependence, whatever its etiology, can be viewed as a prior condition to obesity. Witkin et al. (1967) followed the development of field-differentiation longitudinally in two groups (8 to 13, 10 to 24 years of age) and found a test-retests coefficient of stability of .7 for the rod and frame test (another tool to measure field differentiation), suggesting that field dependence is a relatively stable characteristic and not likely to be effected by such a variable as obesity. Furthermore, in a study by Karp and Konstadt (1967) comparing two groups of alcoholics (another pathologic group with a field dependent

orientation, Karp et al. (1963) no differences in field differentiation were obtained between long-term and short-term drinkers, suggesting that field-dependence is again a prior condition. Without answering the question of cause and effect, some speculation as to the effectiveness of obesity treatment can be made based on the data of the present experiment.

Research in the area of cognitive style has in some instances pointed to differential effectiveness of various types of treatment. Cohen, Silverman and Shmovationian (1963) studied the reactions of Ss to sensory deprivation and found that while field-independent Ss gradually adapted to their surroundings, field-dependent Ss maintained a high level of autonomic activity and were subjectively more disturbed by their isolation. Thus, the more field dependent Ss were unable to cope with the highly unstructured situation in which they found themselves. What this suggests in terms of diet prescription for the obese is that the more strictly defined the eating regime, the more likely he or she is to follow it.

Conditioning studies have indicated that the field-dependent person is a far better candidate than the field-independent counterpart. Studies pairing lights (Hein, Cohen and Shmovationian, 1964) or tones (Courter, Wattenmaker and Ax, 1965) with shock have indicated greater conditionability to the conditioned stimulus (CS) and greater generalizability to other stimuli as CS's in the "field-dependents" as



compared to "field-independents", suggesting that aversive conditioning or positive reinforcement should work well in the treatment of obesity among "field-dependents". Recently, programs utilizing behavior modification techniques have proven fairly successful, at least in terms of weight loss if not maintenance of that loss. A highly structured program is described by Penick et al. (1971) which involves description of the behavior to be controlled, modification and control of the discriminatory stimuli governing eating, development of techniques which control the act of eating and prompt reinforcement of behaviors which delay or control eating. The treatment group as compared to a control group (who were maintained on a standard medical weight-loss diet) lost significantly more weight, although no follow-up to determine maintenance is reported. Stuart (1967, 1973) reported a success rate of 80% of all patients who started on his treatment losing over 20 pounds, with 30% losing over 40 pounds, using a behavioral control program, but again there is little follow-up. From the point of view of long-term effectiveness, the implications of the present findings are somewhat depressing. If obesity is indeed part of a whole cognitive orientation, it cannot be treated without "total treatment": in other words, a whole change of cognitive style may be necessary in order to control weight in certain of the obese. Alternatively, if the field-dependent obese person functions best in a

structured situation (heavily loaded with cues for when and when not to eat) then in order to maintain a reduced body weight he or she may have to remain perpetually in a strictly controlled diet situation. This may be why former obese individuals who are successful Weight Watchers become effective teachers for would-be weight losers. Not only is the structure maintained, they also hear themselves repeatedly espousing the evils of certain food, which cannot help but reinforce the notion in themselves. (In Alcoholics Anonymous this theory has been utilized for decades: hearing themselves telling others not to drink and seeing in others the effects of excessive drinking serve as strong external stimulus for abstention).

If Bruch is correct and the entire field-dependent, obesity syndrome is the result of child rearing practise, then a fruitful approach would be prevention. This would suggest investigating from birth the feeding and caring mechanisms used by parents. However, this would only be useful for future generations. Given Stunkard's (1959a) inability to find subjective expressions of hunger in the obese, even when physiological stomach contractions were present, an area of investigation would be the teaching, through biofeedback techniques, of the feelings of hunger. In any case, what is evident from the data is that obesity treated simply with the prescription of a diet and without recognition of other differences will not be "cured" or

permanently alleviated, but at best will be symptomatically controlled.

The locus of control measures used in this experiment (IE, Rotter, 1966 and IPC, Levenson, 1972) failed to distinguish significantly the obese and the smoker from their control groups. In order to explain such findings a close examination of the locus of control scales and literature has revealed several dubious procedures within the measuring instruments and indeed the whole concept of generalized expectancy of reinforcement. There have been studies with "significant" positive findings using Rotter's IE scale, but there have also been studies with inconsistent findings and methodological flaws (e.g. use of selective samples, lack of adequate follow-up, etc.) (for reviews of IE findings see Joe, 1971; Lefcourt, 1966; Rotter, 1966; Throop and MacDonald, 1971). Few of the studies have been replicated and those which have (e.g. smoking and IE) have failed to confirm the original studies (James, Woodruff and Werner, 1965 found a significant IE difference between smokers and non-smokers, while Hjelle and Clouser, 1965 did not, etc.). In studies on alcoholics (Toss and Morosko, 1970; Gozali and Sloan, 1971), not only were original findings of a internal orientation for alcoholics non-replicable, but a significantly greater external orientation was found for the alcoholics (Butts and Chottos, 1973).

Possible reasons for the present findings, in both

the obese and the smoker, begin with the concept of generalized reinforcement expectation itself. Rotter (1958) has suggested that in order to effectively predict behavior one must take into account three variables: 1) behavior potential: the potentiality of any behavior occurring in any given situation relative to any single reinforcement or set of reinforcements; 2) expectancy: the probability held by S that a particular reinforcement will occur as a function of a specific behavior on his part in a specific situation or situations; and 3) the degree of preference for any reinforcer to occur if possibilities of occurrence of this and other reinforcers are equal. What this indicates is the situation specificity of expectancy and consequential behavior with regards to this particular reinforcement. Rotter himself states, "It is because of the erroneous assumption that the test should predict behavior regardless of the situation that validities tend to be so low" (Rotter, 1955). For example, Coan (1966) pointed out that emphasis in the Rotter IE scale is on social and political events and there is a disregard of items sampling personal habits, traits, goals and other concerns. Thus, the range of applicability should realistically be restricted (Crandall, Katkousky and Crandall, 1965; Coan, 1966; Dies, 1968), but seldom is. Coan (1966) and Sarason and Smith (1971) suggest an improved system of measurement of a less generalized control orientation via the development of more situation-specific IE items.

Although the concept of locus of control has an underlying assumption of IE being a unidimensional trait, recent research makes it no longer tenable (Mirel, 1970; Lao, 1970; Abrahamson, Schludermann and Schludermann, 1973; Kleiber, Veldman and Menaker, 1973; Levenson, 1973). As a result of these studies indicating the multidimensionality of locus of control, Levenson (1972), as previously indicated, has constructed a new scale. While less research has been carried out utilizing her IPC scale, examination of the items (Appendix IV) indicates the same social and political emphasis found in the 1966 IE scale. Therefore, the scale is still situation-specific, and it is still questionable whether one is "internal" or "external" in all situations. Furthermore, the present correlations among IE and IPC scales (Table 13) suggest that Levenson's I and Rotter's I refer to two different things. (The correlation coefficient was  $r = 0.29$  in the present study.) Levenson's (1972) claim that they are tapping the same variable does not hold. (The relationship between I and P in the Levenson scale is not an opposite unidimensional one:  $r = -.18$ .) Thus we still have the problem, at least in the present study, of measuring variables whose dimensions are unknown. I and C ( $r = -.35$ ) do appear to be more opposite and therefore more unidimensional than I and P, but we have no dimensions for the P variable. (An interesting finding in the present study is a correlation between Levenson's I and Witken's EFT of  $r = 0.23$ ,  $p < 0.02$ .)

This has not been found using Rotter's IE, possibly due to the contaminating effect of the P factor.)

Finally, when looking at the support for a smoking-locus of control orientation link, it is not possible to argue either case very forcibly. Arguments for the "chance" position have already been stated in the introduction (.e.g denial of a smoking-cancer link), but there is also an argument for the "internal" position. Tolor and Reznikoff (1967) noted that external scores were positively correlated with death anxiety, suggesting that an "external" would avoid death-linked situations involved in smoking and obesity. Rotter (1966) suggested that internals would be more resistant to environmental manipulation if they were aware of such manipulation, e.g. government warnings or social pressure. Yet, Joe (1970) states that "internals" not only will show more initiative in controlling their environment but also in controlling their own impulses (such as eating and smoking). Inconsistencies in previous findings, conflicting theoretical formulations, and heterogeneity of locus of control tests all contribute to test insensitivity.

While the data from the present study do not support the contention that smoking and overeating are manifestations of the same cognitive-personality traits, there is some evidence that both are symptomatic of a larger more general - though not necessarily similar - behavior orientation. What this suggests (for both) is that treatment must involve more

than the specific symptom or behavior manifested if therapy is to be successful. Research in both areas has led to pessimistic conclusions (Stunkard, 1959a; Bernstein, 1969), yet a review of the literature points to a glaring lack of "total treatment". While it is difficult to say at this point what the most effective "cure" might be (beyond speculations already expressed in this paper), the evidence does point to a need for more research in the areas of antecedents to the symptoms of smoking and obesity.

Field-dependence is not the only variable involved in obesity. Some of the obese are not field-dependent and being field-dependent does not make a person obese. Furthermore, there may be etiological differences between obesity with a childhood onset and obesity beginning at adulthood. What is common to both is the persistence of the excess weight and its return when it has been successfully eliminated. Stunkard's (1958) warning bears repeating: "... Most persons will not stay in treatment for obesity. Of those who stay in treatment most will not lose weight and of those who do lose weight, most will regain it." Treatment alone is not enough. The solution to the question of obesity will lie in a long-term "cure". The evidence of the present study and findings in previous research, indicate that obesity is not a factor in isolation, but a symptom of a whole external orientation and it is perhaps this orientation which will have to be the focus of attention in searching for a remedy.

V. SUMMARY

Previous research in the area of obesity, following two basic approaches (physiologic and personality) has failed to uncover a consistent etiology. However, more recent studies of the eating behaviors of the obese, have indicated a stimulus-bound quality in eating patterns. The finding has been that obese persons appear to be relatively insensitive to internal cues (such as stomach contractions and blood sugar level), while strongly influenced by social and situational factors (such as time on a clock). There is some evidence that this externality of influence extends to other areas of behavior in the obese person: such Ss have been found to be more responsive to salient cues and less responsive to irrelevant cues than normals. Experiments have hypothesized that it is the obese person's cognitive style which causes his eating behavior and thus his overweight.

Another pervasive problem in psychology is the cause and cure of smoking. Research was cited indicating the inability (or unwillingness) to control smoking even in the face of "dangerous" consequences to continuing the behavior, the tendency to gain weight after quitting smoking and the strong suggestion that such behavior is socially influenced. These indicated the possibility that overweight and smoking are different manifestations of similar cognitive styles. As with the obese, there is some indication of stronger responsiveness of smokers to external cues as compared to



external responsiveness of non-smokers.

The present study investigated similarities between the obese and the smoker in terms of cognitive style and locus of control. Overweights, smokers and normals were compared on the basis of locus of control, field differentiation and distractability. It was hypothesized that the obese and the smoker, relative to the non-obese and non-smoker respectively, would display a generally external orientation: i.e. more distractable by competing stimuli, more field-dependent and exhibiting a higher "external" locus of control orientation. Correlations among the dependent variables were also examined. Subjects in the experiment were 76 introductory psychology students who participated as a part of their course requirement and were pre-selected using criteria set for a smoker and a non-smoker, an obese S and a non-obese S. Tests, which might answer the various that were examined, were: the EFT, the Stroop color-word test, the IE, the IPC and a questionnaire. This was followed by measurement of height and weight.

The data were analyzed using an analysis of variance for each of the dependent measures. The only hypothesis to receive support from the data was the one indicating that the obese showed a significantly stronger field-dependent orientation over the non-obese (Hypothesis II). This finding was discussed in terms of the implications for the prevention and treatment of obesity.

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APPENDIX A

Information Sheet

Please give the following information as accurately as possible. The results will remain confidential. PLEASE PRINT.

Name: \_\_\_\_\_ Student ID: \_\_\_\_\_

Age: \_\_\_\_\_

Sex: \_\_\_\_\_

Year in University: \_\_\_\_\_

Faculty: \_\_\_\_\_

Father's occupation: \_\_\_\_\_

Mother's occupation: \_\_\_\_\_

Do you participate regularly in any sport?

Yes \_\_\_\_\_

No \_\_\_\_\_

If yes, please list sport(s). \_\_\_\_\_

Approximate height: \_\_\_\_\_

Approximate weight: \_\_\_\_\_

Do you smoke now? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes: approximately when did you begin to smoke? \_\_\_\_\_

At present I smoke: less than 10 cigarettes per day \_\_\_\_\_

10-25 cigarettes per day \_\_\_\_\_

26-30 cigarettes per day \_\_\_\_\_

30 or more per day \_\_\_\_\_



I have been smoking the above average amount for approximately (length of time) \_\_\_\_\_.

If you do not smoke now:

Did you ever smoke regularly (2 or more cigarettes per day):

Yes \_\_\_\_\_

No \_\_\_\_\_

If yes: less than 15 cigarettes per day \_\_\_\_\_

15-25 cigarettes per day \_\_\_\_\_

26-30 cigarettes per day \_\_\_\_\_

over 30 per day \_\_\_\_\_

I smoked the above average amount for approximately (length of time) \_\_\_\_\_.

Have you put on weight since quitting:

Yes \_\_\_\_\_

No \_\_\_\_\_

If yes, I gained: less than 5 pounds \_\_\_\_\_

5-10 pounds \_\_\_\_\_

over 10 pounds \_\_\_\_\_

APPENDIX B

STANDARD WEIGHTS USED TO DETERMINE THE EXPERIMENTAL AND CONTROL GROUPS: MEAN WEIGHTS FOR MEDIUM BODY FRAME FROM THE METROPOLITAN LIFE INSURANCE TABLES OF DESIRABLE WEIGHTS FOR MEN AND WOMEN.

HEIGHT	WEIGHT IN POUNDS	
	MEN	WOMEN
4' 10"		102
4' 11"		104
5'		107
5' 1"		110
5' 2"	124	116
5' 3"	127	120
5' 4"	130	123
5' 5"	133	128
5' 6"	137	132
5' 7"	141	136
5' 8"	145	140
5' 9"	149	144
5' 10"	153	148
5' 11"	158	152
6'	162	
6' 1"	167	
6' 2"	171	
6' 3"	176	
6' 4"	181	

APPENDIX C

Rotter's IE Scale

Note: The external responses are underlined. IE score is the number of underlined items chose. A high score is a high E score.

Please select the one statement in each pair of statements which you more strongly believe to be the case (as far as you personally are concerned). Be sure to select the one YOU BELIEVE TO BE CLOSER TO THE TRUTH rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief; obviously there are no right or wrong answers. (Remember, mark one and only one statement in each pair.)

USE IBM SHEET #1 = a  
                  #2 = b

I more strongly believe that:

1. a. Children get into trouble because their parents punish them too much.  
    b. The trouble with most children nowadays is that their parents are too easy with them.
2. a. Many of the unhappy things in people's lives are partly due to bad luck  
    b. People's misfortunes result from the mistakes they make.
3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.  
    b. There will always be wars, no matter how hard people try to prevent them.
4. a. In the long run people get the respect they deserve in this world.  
    b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5. a. The idea that teachers are unfair to students is nonsense.  
    b. Most students don't realize the extent to which their grades are influence by accidental happenings.

6.
  - a. Without the right breaks one cannot be an effective leader.
  - b. Capable people who fail to become leaders have not taken advantage of their opportunities.
7.
  - a. No matter how hard you try some people just don't like you.
  - b. People who can't get others to like them don't understand how to get along with others.
8.
  - a. Heredity plays the major role in determining one's personality.
  - b. It is one's experiences in life which determine what they're like.
9.
  - a. I have often found that what is going to happen will happen.
  - b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
10.
  - a. In the case of the well prepared student, there is rarely, if ever, such a thing as an unfair test.
  - b. Many times exam questions tend to be so unrelated to course work, that studying really is useless.
11.
  - a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
  - b. Getting a good job depends mainly on being in the right place at the right time.
12.
  - a. The average citizen can have an influence in government decisions.
  - b. This world is run by the few people in power, and there is not much the little guy can do about it.
13.
  - a. When I make plans, I am almost certain that I can make them work.
  - b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
14.
  - a. There are certain people who are just no good.
  - b. There is some good in everybody.

15. a. In my case, getting what I want has little or nothing to do with luck.  
b. Many times we might just as well decide what to do by flipping a coin.
16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.  
b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.
17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.  
b. By taking an active part in political and social affairs the people can control world events.
18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.  
b. There really is no such thing as "luck".
19. a. One should always be willing to admit his mistakes.  
b. It is usually best to cover up one's mistakes.
20. a. It is hard to know whether or not a person really likes you.  
b. How many friends you have depends upon how nice a person you are.
21. a. In the long run, the bad things that happen to us are balanced by the good ones.  
b. Most misfortunes are the result of lack of ability, ignorance, laziness or all three.
22. a. With enough effort we can wipe out political corruption.  
b. It is difficult for people to have much control over the things politicians do in office.
23. a. Sometimes I can't understand how teachers arrive at the grades they give.  
b. There is a direct connection between how hard I study and the grades I get.

24. a. A good leader expects people to decide for themselves what they should do.
- b. A good leader makes it clear to everybody what their jobs are.
25. a. Many times I feel that I have little influence over the things that happen to me.
- b. It is impossible for me to believe that chance or luck plays an important role in my life.
26. a. People are lonely because they don't try to be friendly.
- b. There's not much use in trying too hard to please people, if they like you, they like you.
27. a. There is too much emphasis on athletics in high school.
- b. Team sports are an excellent way to build character.
28. a. What happens to me is my own doing.
- b. Sometimes I feel that I don't have enough control over the direction my life is taking.
29. a. Most of the time I can't understand why politicians behave the way they do.
- b. In the long run, the people are responsible for bad government on a national as well as on a local level.

## Levenson IPC Locus of Control Scale

CIRCLE THE NUMBER THAT MOST CLOSELY REPRESENTS YOUR OPINION ON THE STATEMENT.

I = internal item  
P = powerful other item  
C = chance item

		Strongly disagree	Disagree somewhat	Slightly disagree	Slightly agree	Agree somewhat	Strongly agree
I 1.	Whether or not I get to be a leader depends mostly on my ability.	-3	-2	-1	+1	+2	+3
C 2.	To a great extent my life is controlled by accidental happenings.	-3	-2	-1	+1	+2	+3
P 3.	I feel like what happens in my life is mostly determined by powerful people.	-3	-2	-1	+1	+2	+3
I 4.	Whether or not I get into a car accident depends mostly on how good a driver I am.	-3	-2	-1	+1	+2	+3
I 5.	When I make plans, I am almost certain to make them work.	-3	-2	-1	+1	+2	+3
C 6.	Often there is no chance of protecting my personal interest from bad luck happenings.	-3	-2	-1	+1	+2	+3
C 7.	When I get what I want, it's usually because I'm lucky.	-3	-2	-1	+1	+2	+3
P 8.	Although I might have good ability, I will not be given leadership responsibility without appealing to those in positions of power.	-3	-2	-1	+1	+2	+3
I 9.	How many friends I have depends on how nice a person I am.	-3	-2	-1	+1	+2	+3
C 10.	I have often found that what is going to happen will happen.	-3	-2	-1	+1	+2	+3
P 11.	My life is chiefly controlled by powerful others.	-3	-2	-1	+1	+2	+3
C 12.	Whether or not I get into a car accident is mostly a matter of luck.	-3	-2	-1	+1	+2	+3
P 13.	People like myself have very little chance of protecting our personal interests when they conflict with those of strong pressure groups.	-3	-2	-1	+1	+2	+3
C 14.	It's not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune.	-3	-2	-1	+1	+2	+3
P 15.	Getting what I want requires pleasing those people above me.	-3	-2	-1	+1	+2	+3
C 16.	Whether or not I get to be a leader depends on whether I'm lucky enough to be in the right place at the right time.	-3	-2	-1	+1	+2	+3
P 17.	If important people were to decide they didn't like me, I probably wouldn't make many friends	-3	-2	-1	+1	+2	+3
I 18.	I can pretty much determine what will happen in my life.	-3	-2	-1	+1	+2	+3

	Strongly disagree	Disagree somewhat	Slightly disagree	Slightly agree	Agree somewhat	Strongly agree
I 19. I am usually able to protect my personal interests.	-3	-2	-1	+1	+2	+3
P 20. Whether or not I get into a car accident depends mostly on the other driver.	-3	-2	-1	+1	+2	+3
I 21. When I get what I want, it's usually because I worked hard for it.	-3	-2	-1	+1	+2	+3
P 22. In order to have my plans work, I make sure that they fit in with the desires of people who have power over me.	-3	-2	-1	+1	+2	+3
I 23. My life is determined by my own actions.	-3	-2	-1	+1	+2	+3
C 24. It's chiefly a matter of fate whether or not I have a few friends or many friends.	-3	-2	-1	+1	+2	+3



APPENDIX E(i)

Stroop Color Word Test

The following words comprise the practise list, given to all S's preceeding List HI and LI. The color name in parenthesis indicateds the color of Letraset in which the word is printed.

BLUE (GREEN)

GOLD (BLACK)

RED (BLUE)

GOLD (GREEN)

BLUE (RED)

BLACK (GOLD)

GREEN (RED)

BLACK (BLUE)

GOLD (RED)

BLUE (BLACK)

RED (GREEN)

GOLD (BLUE)

APPENDIX E (ii)

List I: Low Interference List

The words following are the slides presented to S's as the low interference (LI) condition, in the order of presentation. The ink color used follows each word in parenthesis.

Run (Black)	Hold (Red)	Hold (Green)
Hold (Gold)	Run (Gold)	Take (Black)
Put (Blue)	Hold (Red)	Run (Red)
Take (Black)	Run (Green)	Take (Blue)
Hold (Red)	Take (Blue)	Hold (Black)
Put (Black)	Run (Red)	Put (Gold)
Take (Green)	Put (Black)	Run (Black)
Run (Gold)	Hold (Gold)	Hold (Blue)
Take (Red)	Run (Black)	Take (Red)
Put (Gold)	Take (Gold)	Run (Blue)
Hold (Black)	Hold (Blue)	Take (Green)
Run (Blue)	Put (Green)	Run (Gold)
Hold (Green)	Take (Red)	Put (Red)
Take (Gold)	Hold (Green)	Take (Black)
Put (Green)	Put (Gold)	Put (Green)
Run (Red)	Run (Blue)	Hold (Red)
Hold (Blue)	Hold (Gold)	Put (Black)
Run (Green)	Put (Blue)	Take (Green)
Put (Red)	Run (Green)	Put (Blue)
Take (Blue)	Put (Red)	Take (Gold)

APPENDIX E (iii)

List II: High Interference List

The following words are the slides presented to S's as the high interference (HI) condition, in their order of presentation. The ink color used follows each word in parenthesis.

Blue (Red)	Red (Green)	Blue (Red)
Gold (Black)	Gold (Blue)	Gold (Green)
Blue (Green)	Red (Green)	Blue (Black)
Black (Gold)	Black (Blue)	Green (Red)
Green (Red)	Green (Gold)	Black (Blue)
Black (Blue)	Blue (Black)	Green (Gold)
Gold (Green)	Gold (Green)	Red (Black)
Red (Black)	Red (Black)	Gold (Blue)
Blue (Green)	Blue (Gold)	Red (Green)
Black (Gold)	Green (Red)	Black (Gold)
Green (Blue)	Gold (Black)	Green (Blue)
Gold (Red)	Red (Blue)	Gold (Red)
Green (Black)	Green (Black)	Blue (Green)
Blue (Red)	Red (Gold)	Red (Gold)
Black (Green)	Black (Green)	Green (Black)
Red (Gold)	Gold (Blue)	Blue (Gold)
Blue (Black)	Black (Red)	Black (Red)
Green (Gold)	Green (Blue)	Green (Blue)
Black (Red)	Gold (Red)	Gold (Black)
Blue (Gold)	Black (Green)	Red (Blue)

APPENDIX F

NAME \_\_\_\_\_

1. Do you consider yourself to be overweight?

Yes \_\_\_\_\_

If yes, for how long has this been so?  
\_\_\_\_\_

Approximately how many pounds overweight do you consider yourself to be?  
\_\_\_\_\_

Have you ever gone for outside help to lose weight (e.g. doctor, Weight Watchers, etc)?

No \_\_\_\_\_

Yes \_\_\_\_\_  
(Please list below)

What do you consider to be the cause of your overweight?

Would you like to be thinner?

No \_\_\_\_\_

Yes \_\_\_\_\_

2. Do you smoker regularly?

No \_\_\_\_\_

Yes \_\_\_\_\_

On the average I smoke \_\_\_\_\_  
(amount) cigarettes per day.

3. Please list below all brothers, sisters and parents and whether they have a weight problem or smoke.

NAME	RELATION	OVERWEIGHT?	SMOKE?
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

APPENDIX G

RELIABILITIES

Witkin EFT (Witkin et al., 1971)

Split half: .90  
.92  
.95  
Test-retest (3 years): .89  
Tyron's variance: .85  
.90  
.82

Rotter IE

Test-retest: .43-.84 (Hersch, 1967)  
.49-.83 (Rotter, 1966)  
Internal Consistency: .65-.76 (Rotter, 1966)

Levenson's IPC (Levenson, 1972)

Kuder-Richardson: .64 for internal (I) scale  
.77 for powerful others scale (P)  
.78 for chance scale (C)  
Split-half Spearman Brown: .62 (I)  
.66 (P)  
.64 (C)  
Test-retest (1 week): .64 (I)  
.74 (P)  
.78 (C)