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AND ITS RELATION TO SMOKING BEHAVIOR.

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THE DEVELOPMENT OF A REINFORCEMENTS INVENTORY
AND ITS RELATION TO SMOKING BEHAVIOR

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ABSTRACT

Smoking is a form of easily observed behavior exhibited by a large percentage of the population. Beginning early in the present century, students of human behavior have reported a variety of behaviors associated with the act of smoking. A review of this literature suggested possible utility for developing an index of the relative influence of assorted events, objects and people on an individual's behavior. A 23-item self-rating scale similar in format to the Semantic Differential was developed (the Satisfactions Inventory, abbreviated SI) to test the hypothesis that smokers are influenced by different things than are non-smokers. In addition, the literature suggested that several existing personality scales should have also been of some value in discriminating smokers and non-smokers. Because the SI was seen as a more direct and extensive measure of pertinent learned behavior associated with smoking, it was also hypothesized that the SI should have equal, or better, discriminative utility than the other measures.

The primary data were collected from 115 high school sophomores taking a required Health course. In addition to the SI, the Social Desirability, Social Avoidance and Distress, Frequency-Response, Intellectual Academic Responsibility, Locus of Control, and two Alienation scales were used to assess each S. After a six week interval, 40 Ss

were retested on the SI to provide some indication of its reliability. Earlier in the development of the SI, two other samples of high school and college Ss were given a preliminary form of the SI along with several of the other scales. A third auxiliary sample of college Ss were given the SI on a three-week test-retest basis.

Step-wise discriminant analyses of the data supported both the hypotheses of different reinforcer hierarchies for smokers and non-smokers and of the discriminative efficacy for the SI over the more traditional personality scales. Single SI item scores, as well as several part scores based on simple unweighted sums, had significant utility in classifying smokers and non-smokers. Also, different SI items were useful in discriminating males from females. All but one of the smoker-non-smoker mean differences for the other personality scales were in the predicted direction but, as a battery of tests, could not succeed either grade point averages or the SI in their discriminative power. The reliability coefficients of the SI items taken singly and the various summary scores were significant for both the high school and college samples. The data from the three auxiliary samples tended to support the major hypotheses, although the college data were not as unequivocal.

The present findings were discussed in terms of some recent learning analyses of what occurs when S fills out a typical personality inventory. The possible significance of

the current results for some of the difficulties with existing smoking modification programs was discussed. Some of the present study's limitations were also indicated, along with suggestions for future applications of the SI.

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CHAPTER I

Those behaviors that have sometimes been described as "paradoxical" in nature (Mowrer, 1950), as well as "disadvantageous" and "maladaptive" for those engaging in them (Krasner & Ullmann, 1965), continue to offer a challenge to behavioral scientists. Why should an individual initiate behaviors that prove to be self defeating and have harmful consequences, often to a rather severe, even lethal degree? Why do some continue with certain habits, even after being presented with apparently ample evidence demonstrating the self-destructive consequences of maintaining the behaviors? One specific behavior that has long interested students of behavior (Hervey, 1907; Meylan, 1910) and which continues to offer a particular challenge to those trying to modify it (Keutzer, Lichtenstein, & Mees, 1968; Bernstein, 1969) is smoking behavior.

A Behavioral Analysis of Smoking Behavior

Various approaches have been taken in attempting to describe, explain, and modify smoking behavior. Some recent attempts have included using a cognitive dissonance model (Brock, 1965; Johnson, 1968), a personality trait approach (Bischof, 1964; Eysenck, 1960, 1965; Eysenck, Tarrant, Woolf & England, 1968; Digman & Young, 1969), and a learning model (Tomkins, 1968). Because a behavioral analysis has proven to be of considerable heuristic value in the understanding

and modification of many forms of disadvantageous behaviors -- for example, in the modifying of "chronic schizophrenia" (Ayllon & Azrin, 1968), "childhood autism" (Lovaas, Frietag, Gold & Kassorla, 1965), "stuttering" (Webster & Lubker, 1968), and "pre-delinquent behaviors" (Thorne, Tharp & Wetzel, 1967) -- the emphasis in this paper will be on a learning model of smoking. In the following sections we shall explore pertinent literature relating to the acquisition and maintenance of the smoking habit. Of particular importance will be the implications of viewing smoking in context of other sources of reinforcements operating in the smoker's life situation.

The inhaling of tobacco smoke into the oral cavity, and especially the lungs, produces both a functional and structural change in the tissue of the smoker (U. S. Surgeon General, 1964). At the same time, allowing for the body's usually rapid habituation to the aversiveness of the smoke's initial harshness, etc., a positive emotional state is usually experienced by the smoker. It is further known that inhaling tobacco smoke increases cortical activity and thus acts as a stimulant on the central nervous system (Murphee, Pfeiffer & Price, 1967; Armitage & Morrison, 1968). There is also evidence that smoking behavior can be elicited in monkeys and other research animals and that it can be maintained without any other reinforcement than the smoking itself (Jarvik, 1967). Therefore, once positive attitudinal responses have been established to smoking stimuli, cigarettes

are able to serve as conditioned reinforcers. It has been observed by clinicians, e.g., Ayllon and Azrin, 1968, that cigarettes are potent reinforcers of behavior in a token economy system. Cigarettes also can have strong discriminative control over certain behaviors. The smoker, for example, will frequently exhibit "striving for" classes of responses in order to obtain cigarettes after being deprived of them. When you consider the immediate and extremely convenient and socially acceptable reinforcing qualities of cigarettes along with the usually long delayed and indirect harmful consequences involved, it is not surprising that man would become dependent on the use of tobacco.

The chemical agents involved in inhaling tobacco smoke have a much milder behavioral effect than such drugs as cocaine, morphine or heroin. The role of "psycho-social" variables are thought to be of equal, if not greater importance than physiological factors in explaining the acquisition and maintenance of the smoking habit (Hochbaum, 1964; Hunt & Matarazzo, 1967; Leventhal, 1967; and Matarazzo & Saslow, 1960). The major psycho-social variables that have been investigated for their possible contribution to the prediction of smoking behavior have involved primarily demographical and biographical variables, e.g., age, sex, income, ethnic and social class, occupation, education. In addition, various higher level of abstraction constructs have also been studied, including IQ, anxiety, tension,

suggestability, emotional stability and psychosomatic complaining. In the following paragraphs some of these data will be discussed from a behavioral viewpoint.

Tomkins (1968) has pointed out that apparently smoking can be "learned to relieve any negative affect and to evoke any positive affect". Several positive affects that have been suggested as being potent elements in the acquisition of the smoking habit involves the second order emotional conditioning that often occurs, especially in young smokers, before the actual behavior of smoking is started. A most obvious example of this phenomenon is the persistent association of cigarettes and the smoking of them with already positively conditioned written, oral and pictorial stimuli as is found in most cigarette advertising. Stimuli depicting robust health, youth, sophistication and maturity are repeatedly associated with cigarettes and smoking. Weir (1967) has found, for example, that high school boys rate photographs of males and females quite differently, depending on whether smoking cues are present or absent, in this case "erased" from the negatives. Non-smoking was rated as indicating "timidity" while smoking was perceived as demonstrating "adventuresomeness" and "recklessness".

Schubert (1959) and Phanishayi (in Matarazzo & Saslow, 1960) report on some of the reasons given by students for initiating their smoking. The major reasons all appear to involve the "trying on" of the behavior in order to discover

its reinforcement value. Most smokers indicated they were first enticed into trying their first cigarette as a result of directly observing others enjoying the habit. Parents especially appear to serve as excellent models for learning how to smoke. Over 75% of Phanishayi's subjects agreed with the following statement, "I wanted to see what sort of pleasure I would get out of it." The most frequently given reasons for continuation of the habit seem to be closely related to Tomkins' description of the cigarette's ability to "relieve any negative affect". Most subjects indicated that by smoking they were able to reduce tension, anxiety and loneliness. It is interesting that although Phanishayi's research was conducted in India, essentially identical comments have been reported by Schubert (1959) using an American sample of student smokers.

Once smoking is begun, the relative strength that it serves as a reinforcer is seen as being largely a function of what other reinforcers are operating in the individual's life. Several of the characteristics that differentiate smokers and non-smokers, as reported in Matarazzo and Saslow's (1960) extensive review on smoking behavior, are held to be indirect but important evidence supporting the above notion. The reviewers report that smokers have a higher incidence rate than non-smokers for the following: a) being widowed or divorced, b) being unemployed, c) being a non-professional and unskilled worker, d) being in the

military, e) changing jobs more frequently, f) having a poorer scholastic record, g) dropping out of school, h) participating more in athletics in high school, i) having been in more traffic accidents, j) having parents that smoke, k) having more days of being hospitalized per year, and l) drinking more coffee and alcohol. While these data are not all the variables summarized by Matarazzo and Saslow, they represent almost all those representing the more behaviorally defined criteria.

As might be expected, the above list of differentiating variables was derived from many different studies, involving different samples, scales and criteria. Some of these reported differences also contain no indication of the statistical significance reached, and of those characteristics that reached significance, the mean differences between smokers and non-smokers are often not large. But, even considering such limitations in interpretation as involved with such data, it is argued that perhaps all of these differences are pointing to an important distinction between smokers and non-smokers. For some individuals, it appears that smoking is concomitant with having what may be described as a different set of functioning reinforcers than is the case for non-smokers. Matarazzo and Saslow's review suggests such differences are related to possible chronic deficits in specific areas of the smoker's behavioral repertoire and/or crucial response contingencies coming into

conflict with competing response patterns already existing.

If, as it has been suggested here, there are important differences in the reinforcer systems of smokers and non-smokers, it is predicted that whatever measures exist for quantifying crucial parameters of such reinforcer systems should be valuable in predicting smoking behavior. While there has been considerable discussion centered on the theoretical importance of reinforcement hierarchies in understanding behavior (e.g., Staats, 1969), and though some researchers have attempted to directly observe reinforcer systems in a clinic population (Ayllon & Azrin, 1968; Kanfer & Saslow, 1965), there has been little, if anything, in the literature on the relevancy and measurement of individual differences in the relationship and relative strengths of various reinforcers and how such information might be of use in the prediction of such specific behaviors as smoking. In the next part of the paper, we shall first discuss some indices that are seen as being related to important aspects of an individual's reinforcer system, although most of these measures are labeled differently. Following that discussion the theoretical rationale for what is held to be a more direct measure of a person's reinforcer system will be outlined.

Some Existing Measures Related to the Concept of a Reinforcer System

"Alienation", a construct with a long history in

sociology and political science--reviews by Dean, 1961, and Nettler, 1957, discuss the historical contributions made by Negel, Marx, Durkheim and others to this concept--is currently becoming popular again as an "explanation" of assorted human behavior. But as Skinner (1968) succinctly clarified, alienation, rootlessness, anomie and similar terms, ". . . are not the causes of anything; at best they are often products of the defective contingencies which are the sources of the trouble attributed to them . . . (p. 168)." Thus, to the extent that smokers may have learned behaviors which are inadequate with regard to successful acquisition of various potent reinforcers in our society, they could be labeled as being more "alienated" than non-smokers. Various attempts at measuring "alienation" will be discussed below, along with some of the behavior the construct has been able to predict.

Nettler (1957) phrases his definition and measurement of "alienation" in terms of an individual's "feelings of estrangement from society". He constructed a brief scale requiring his subjects to rate the enjoyment they derive from such items as watching TV, reading the Reader's Digest, voting in elections, children, automobiles, attending church and participating in sports. While Nettler chooses to interpret his scale differently, it is seen in the context of a behavioral analysis as measuring the reinforcement value of a series of socially popular reinforcers for different individuals. Others have relied on Likert format attitude scales to measure

expanded, more abstract definitions of "alienation". For example, Dean (1961) has developed a 24-item scale to measure attitudes of Powerlessness, Normlessness, and Social Isolation. Thus far, only limited research has been reported for either of these scales. But what research has been cited indicates that a learning interpretation of the scales is plausible, e.g., Dean found his scale to be negatively related to occupational prestige, education, income and rural background.

A recent scale created by Watson and Freind (1969) is conceptually related to Dean's "Social Isolation" scale. Their Social Avoidance and Distress (SAD) scale was developed to measure approach-avoidance attitudes in social situations. To the extent it does measure such behavior it should be an index of generalized reinforcer strength associated with interpersonal events. Watson and Friend have reported that persons scoring high on the SAD tend to avoid social interactions, preferred to work by themselves, expressed less confidence about social interactions and indicated that they talked less than did low SAD scorers.

Seeman and Evans (1962) have used as a definition and measure of "alienation" a scale that is viewed as being theoretically closer to explaining that term behaviorally. They measure "alienation" by means of selected items from Rotter's (1966) Locus of Control scale (LOC). This forced-choice scale, which was developed out of Rotter's social

learning theory (Rotter, 1954, 1960, 1966; Rotter, Seeman & Liverant, 1962), is postulated to measure an individual's perception of his ability to control the outcome of events. Those with an external LOC are said to perceive the reinforcements they experience as being beyond their control. Fate, chance, luck or some other external factor are often posited by those high on the external end of the LOC as the reason events turn out as they do. Internal LOC individuals, on the other hand, are seen as being more aware of the relationship between their behavior and the consequent reinforcements. Seeman and Evans found that in a sample of hospitalized patients, matched for sex, ethnic background, years in the hospital, and hospital experiences, there were significant differences in certain behaviors depending on whether the patient scored high or low on the LOC scale. Those more internally oriented had a better objective knowledge of tuberculosis as well as a more realistic knowledge of their own prognosis.

The internal end of the LOC continuum has also been shown to be positively and strongly related to better academic performance (Coleman, et al., 1966; Crandall, Katkovsky & Crandall, 1965; Crandall, Katkovsky & Preston, 1962; Katkovsky, Crandall & Good, 1967; and Katz, 1967). This relationship suggests again that knowledge of the instrumentality of one's own behavior as a source of the reinforcements experienced is related to the efficacy with which one

responds to the daily problems of living. A recent study by Phares (1968) provides some experimental evidence for this interpretation. In a computer simulation task, he found those more internal on the LOC scale used acquired information more effectively than external scorers did in solving a series of problems.

Failure to comprehend the major stimulus-response contingencies operating in one's life routines is thus viewed as leading to frustrations and, for many, often results in the employment of ever increasing irrelevant responses in an attempt to deal with the sense of frustration. Where deficits involving earlier learned responses limit the probability of obtaining reinforcements that often are associated with lengthy chains of behavior, it is argued that reinforcers easier to obtain will be sought. Hollingshead and Redlich's (1958) and Srole's (1965) demonstration of the strong relationship between social class and disintegrated behavior patterns indicate the effects on behavior if the reinforcements are too severely restricted. Their findings suggest that concomitant with lower socio-economic status is a more inadequate learning history that results in the individual being excluded from many of the potent reinforcers that exist in a complicated, technical society.

There exists some experimental evidence that supports the idea that whatever individual differences the LOC concept is tapping, scores are associated with certain

behaviors. For example, Watson and Bauml (1967) found a significant interaction between LOC scores and the number of errors made in learning a list of paired associates CVC tri-grams under different sets of instructions. Internal scorers made more errors on the acquisition trials when they were under the impression that, on the other lists to be learned, avoidance of an electric shock would be on a "chance" basis. Those Ss scoring high on the external end of the LOC continuum made more errors when they were informed that the avoidance of the shock depended upon their "skill" to make a response which they had already learned. Strickland (1965) found a significant correlation between LOC scores and civil rights activities in a population of Southern Negroes. Gore and Rotter (1963) found similar results in a comparable population when they used a petition-type scale that had real follow through implications for the signers. In general, increased commitment to carry out "social-action" plans was followed closely by increased internal scores.

Lewit and Virolainen (1968) reported somewhat similar findings, although the subjects and behaviors of interest were different. They found a significant correlation between a desire for orthodontic treatment, in a sample of adolescents, and internality as measured by an LOC-type scale developed by Bialer (1961). Their data are more complicated to interpret because of an interaction with social class and anxiety. In the framework of this paper their results are quite

logical, however. The highest correlation between desire for orthodontic therapy and LOC occurs with those upper social class individuals having lower anxiety scores. In addition, for this same group there was a significant negative relationship with Need for Peer Approval, a scale devised by the authors, and LOC. This suggests that for this group "peer approval" represents less of a reinforcement than perhaps their own self-employed reinforcers.

Relatively few studies have attempted to explore directly the relationship between smoking behavior and LOC. The long known and reliable negative correlation between smoking and grade point averages (Pumroy, 1967, reviews this research back to the turn of this century) would suggest that smokers should be more external than non-smokers. Straits and Sechrest (1963) found a low, but significant positive relationship between external scores on the LOC and smoking. James, Woodruff and Werner (1965) found that higher internality scores were significantly more likely to be influenced by the data contained in the U. S. Surgeon General's report (1964). For male subjects, increased internal scores were associated with greater cessation of smoking. However, in a recent study, Keutzer (1968) found a zero correlation between Rotter's LOC scale and the outcomes of various behavioral modification techniques applied to smokers. She also concluded that there were no differences among three behavioral techniques and a placebo group.

Because Keutzer's study is one of the few involving experimental controls in the area of LOC and smoking behavior research, her results will be looked at more closely.

There are some rather unique aspects to her study that are seen as confounding her results. Her subjects were volunteers who had responded to an advertisement in a newspaper for a smoking clinic study. The differences between volunteers and non-volunteers have long been known to influence the generalizations that can be made from data--for example, see Scheier (1959). There is evidence, although Keutzer does not comment on it, that her volunteers were generally more "internal" to begin with. The mean LOC score for her sample of 213 males and females was 7.0. Rotter reported a mean of 8.29 for a sample of 1180 college students in his 1966 monograph on his scale. These two means differ from one another at the .001 level of significance. Moreover, Keutzer forced attendance at the therapy sessions by insisting that every subject, including the placebo-drug group, deposit \$20.00 of his own money. Thus, all subjects, regardless of treatment condition, were reinforced at the end of the study by the return of their own money. When the unique character of her sample is considered, together with the forced attendance and reinforcement via money, along with the brief amount of "therapy" involved (three one-hour sessions for each of the four treatment groups), it is not unusual that LOC and treatment

outcomes would have a low correlation with one another.

Perhaps even more significant for the arguments being given in the current research, are the results which Keutzer reported as being statistically significant. She found a correlation of .20 (significant at the .01 level) between treatment outcomes and a scale she developed. Her Effective Cognitive Dissonance (ECD) scale consists of two parts. The first part asks the subject to estimate his age of death if he continues to smoke and his age of death if he should stop smoking immediately. Keutzer then subtracted the latter age from the former and from that number she in turn subtracted the number of rationalizations for smoking the individual agreed with from a list of 18 such statements. The higher this score, the more it would seem that anti-smoking attitudes are being expressed. In addition to the significant correlation between outcomes and ECD, two other variables out of a total of 22 were significant at the .05 level. Age of the smoker and the number of years spent smoking both correlated negatively with outcome. Keutzer uses a cognitive model in an attempt to interpret these relationships. A simpler, less abstract explanation of these data would be to reinterpret the ECD scale as a measure of the strength of smoking as a source of reinforcement for the individual filling out the scale. Also, with an increase in age and number of years smoking, there should be an increase in the relative strength of smoking in the individual's

reinforcer system and hence should be negatively related to attempts to modify the smoking behavior. Johnson (1968) found that smokers endorsed more pro-smoking statements on a 35 item Likert-type scale than did non-smokers. In addition, smokers announcing intentions to stop smoking, as well as ex-smokers, endorsed no more of these items than did non-smokers. As in the previous case, Johnson interprets these results as supporting a dissonance model.

It should be pointed out that the dissonance model has repeatedly had difficulty predicting and explaining smoking behavior (Brock, 1965; Feather, 1962; Sears & Freedman, 1965). For example, Brock reports that smokers, contrary to dissonance predictions, do not differ from non-smokers in their preference for evaluating information prospectively that linked smoking with lung cancer. To "explain" this discrepancy, Brock reformulates the dissonance model until he has it saying essentially what a behavioral model states more directly and explicitly to begin with. He writes, ". . . persons will expose themselves to cognition dissonant with their choice (of behavior, opinion, object, etc.) in direct proportion to the number and importance of prior cognitions consonant with the choice . . . (p. 17)."

The Construction of a Reinforcements Inventory

From the review of the foregoing research studies, it is felt that while such concepts and measures as the LOC, for instance, have been of value in helping to understand smoking

behavior, there may be heuristic value in developing a more direct and specific measure of concern in the present research --the individual's reinforcer system. Sentence format test items, in general, may be said to be of predictive value to the extent that they tell us something about the reinforcement value of the verbal referents for the individual. A more direct and lower level of abstraction item format was desired here, however. Characteristics of the Semantic Differential technique (Osgood, Suci & Tannenbaum, 1957) suggested it as a possible prototype for the required reinforcer inventory. In the following section, the rationale for the creation of the reinforcer inventory will be discussed.

The Semantic Differential (Osgood, et al., 1957; Snider & Osgood, 1969), as a measure of "semantic space", has been widely used in psychology. The Evaluative, Potency, and Activity (EPA) "dimensions" that have been extracted via factor analysis of Semantic Differential scales have generated immense interest. Carroll, in an important review published in 1959, challenged this EPA interpretation of the technique. His alternative explanation of the EPA dimensions is a major theoretical basis for the inventory specifically constructed for the present research. Carroll argues that the evaluative dimension (E), which has been repeatedly found across studies and across different linguistic groups, actually measures the extent to which the various stimuli (called "concepts" in the SD scale) on the inventory have positively

or negatively reinforced the individual's responses. Thus, because E is measuring a crucial parameter of behavior, namely the reinforcement value each stimulus has for the individual, it is predicted that cross-cultural stability should be found. Carroll also redefines both the Potency (P) and Activity (A) accordingly. He feels that P refers to the amount of adjustment that is made to a stimulus and that A is a measure of the degree of necessity of making movements in adjusting to stimuli. Perhaps more explicitly behavioral terms for these two dimensions would be to reinterpret P as the discriminative control, or degree of influence, each stimulus exerts on the behavior of the individual and to define A as some parameter of response frequency, or the frequency of occurrence any stimulus has in influencing behavior.

The SD technique is thus seen as actually indexing the person's experiences with the objective referents of the concepts rated. The resulting ratings are dependent upon the sum total of the learning and experiences that are available to him as he fills out the inventory. This different perspective on the SD has led Carroll to suggesting renaming Osgood's technique to read the "Experiential Differential". Recent research by Wiggins and Fishbein (1969) empirically demonstrated that individual differences in the semantic structure do indeed exist, as Carroll's reinterpretation suggests it should. In addition, the demonstrated relationship between Edward's (1957) social desirability factor and

the Semantic Differential's E (Ford & Meisels, 1965; Hallworth, 1965) is regarded as further evidence that E is actually measuring the reinforcer value associated with each concept. Both dimensions are not to be construed as being invariant but rather that they reflect the learning experiences of the individual.

It should be made clear that the inventory being proposed here represents a somewhat different approach to measurement. Typically, when an item is written for a scale, particularly in the rational method of scale construction (Hase & Goldberg, 1968), the assumption made is that the item is of some relevancy in measuring some construct that the test maker has in mind. In the inventory that was developed to test the hypotheses of this research, no hypothetical abstractions, such as "alienation" or "ego strength" were involved. Rather, the attempt was made to create some index of the various reinforcers that often operate in a person's daily life. It is argued that knowing something about the relative strengths of different reinforcers operating in an individual's life is an important and relatively unmeasured dimension upon which to compare people as well as to make predictions about their behavior. Describing such reinforcer systems, usually at the anecdotal level, has been a crucial prerequisite in behavioral modification research (Ayllon & Azrin, 1968; Ullmann & Krasner, 1965; and Fairweather, 1964).

The items selected for rating were a variety of persons, events, and objects thought to be representative of the more pertinent reinforcers existing in our society. An attempt was made to include items differing along such dimensions as: a) the amount of physical exertion and effort needed in order to respond to the items, b) the number of prerequisite, or prior chained behavior needed before being able to experience the item, and c) the amount of inter-personal responses required in order to experience the item. A total of 23 such items were finally selected as representing either persons, events, or objects that potentially are capable of serving as important determinants in behavior: EATING, BOOKS, FRIENDS, MUSIC, SPORTS, SCHOOL, JOB, FATHER, HOBBIES, MONEY, SMOKING, CARS, MOTHER, SLEEPING, TELEVISION, CHURCH, DRINKING, MOVIES, RELATIVES, DATING, MARIJUANA, CHILDREN, and ANIMALS. Hereafter, this inventory will be referred to as the Satisfactions Inventory (SI).

Statement of the Hypotheses

By the creation of the Satisfactions Inventory (SI), it was hypothesized that a more direct measure of an individual's reinforcer system was now available. With this inventory it was felt that it was possible to test hypotheses generated earlier regarding postulated descriptive differences in the reinforcer systems of smokers and non-smokers. The major hypotheses were:

Hypothesis 1. It was predicted that smokers and non-

smokers should have both qualitative and quantitative differences in their respective average reinforcer systems, as variously measured. Smokers should score higher on the various measures discussed under the topic of "alienation". On the reinforcer inventory, smokers should give higher ratings to items of a similar nature as SMOKING, i.e., items that are apersonal and relatively effortless to experience. The 23 items on the SI are seen as being divisible into two a priori groups: "smoking-type reinforcers" and "non-smoking-type reinforcers". The former is defined as items involving less inter-personal interactions with less complicated behavioral chains prerequisite to experiencing the item, and more immediately gratifying. The eight items EATING, SMOKING, CARS, SLEEPING, TELEVISION, DRINKING, MOVIES, and MARIJUANA were labeled as the "smoking-type" items. The remaining 15 SI items were seen as being sufficiently different on the criteria used to categorize "smoking-type" items, as to warrant the label "non-smoking-type" items.

Hypothesis 2. To the extent that the various measures selected for study allow the subject to indicate as directly as possible something of his prior learning experiences, especially the reinforcement value and discriminative control of pertinent stimuli, the better we should find any given measure discriminating between smokers and non-smokers. It is hypothesized that the reinforcer inventory should have equal or better discriminative power when compared with the

less direct, higher level of abstraction scales.

CHAPTER II

METHOD

Several samples of Ss were tested during the development of the SI. The data collected in the earlier phases of the research will be treated as auxiliary evidence for the purposes of this dissertation. The emphasis will be placed on the final set of data gathered. The auxiliary data will be referred to at appropriate points in the Results section, where it will be treated as substantiating information.

Subjects

A total of 127 sophomore high school Ss enrolled in three health classes at a large high school on the Hawaiian island of Maui, were made available for testing. Of this number, 53 were females, 74 males; 64 Ss identified themselves as non-smokers (NOSMO), 25 said they had quit (EX) and 38 indicated they currently were smoking at least one cigarette a day (SMO). For both SMO and NOSMO groups, 58% were males. These Ss represent a rather typical sample of rural Neighbor Island adolescents, i.e., most of the students have lived their lives on Maui where their parents earn their living through agriculture and the tourist industry. The ethnic affiliation of the sample is also typical for rural Hawaii, with the following percentages found: Japanese (46%), part-Hawaiian (24%), Filipino (13%), and Portuguese, Caucasian, Puerto Rican, and Chinese making up the remaining 17%. While

these categories appear to be a rather unusual conglomerate of nationalities and race, they reflect the historical introduction of peoples into the islands (Lind, 1967). The mean age of the Ss was 15.2 years.

Scales and Related Measures

A battery consisting of 8 scales, a Smoking Questionnaire, and the SI was used in this research. The following is a description of the battery along with some indication of important psychometric properties, where available, of each scale. A copy of all the instruments used appears in the Appendix.

Scales of "Alienation". Dean's (1961) measure of Alienation is a Likert-type scale, consisting of 24 items. A 5 point scale is used to indicate the amount of agreement with each item. Dean considers the concept of alienation in terms of 3 components and provides a measure of each--Powerlessness, Normlessness, and Social Isolation. An item exemplifying each of these components would be, respectively, "We are just so many cogs in the machinery of life;" "Everything is relative and there just aren't any definite rules to live by;" and "Sometimes I feel all alone in the world." Dean reported (1961) split-half reliabilities of .78 for Powerlessness, .73 for Normlessness, .84 for Social Isolation, and .78 Total Score.

Nettler's (1957) construction of his Alienation scale followed quite a different course of development. After

interviewing 37 individuals nominated by acquaintances as being "notably estranged from society", a 17 item scale was constructed based on common evaluative judgments expressed by the criterion group. The group consisted of persons ranging in age from 18 to 76 from diverse social status and with varied "mental health". Nettler reported a rather clear set of "common attitudes" existing in this group, with a consistent maintenance of "unpopular and adverse attitudes towards familism, the mass media and mass taste, current events, popular education, conventional religion and the telic view of life, nationalism, and the voting process". His test therefore asks the taker to indicate his amount of agreement or disagreement, or in some instances his frequency of engagement in such behaviors as voting, watching TV, attending church, and following national sports activities. The mean score on this scale for the "alienated" group was highly and significantly different from the mean score for 515 unselected Ss, including army personnel, restaurant workers, cannery workers, masons, PTA members, and college students. Nettler reported (1957) a reproducibility coefficient of 87% for his scale.

Watson and Friend's (1969) Social Avoidance and Distress scale (SAD) was developed using Jackson's (1966) rational criteria for scale construction. Jackson emphasizes maximizing homogeneity and the discriminant-convergent validity of items and controlling such factors as social

desirability and other response biases. The SAD scale is seen as a measure of individual differences in the amount of distress and negative emotional reaction and avoidance behavior generated by social situations. Examples of the True or False items on the SAD are, "I often find social occasions upsetting," and "I usually feel calm and comfortable at social occasions." That Watson and Friend were able to achieve a high degree of homogeneity with such items is reflected in the Kuder-Richardson Formula 20 reliability figures of .94 on the SAD, for 2 different samples. One month test-retest reliability coefficients of .68 and .79 have been reported. The form of the SAD used in the current research included 10 items from the Crowne-Marlowe (1964) Social Desirability scale and also 6 items from Jackson's (1966) Frequency Response (FR) scale. The latter scale was used as an index of pseudo-responding on the part of the respondents.

The Locus of Control (LOC) scale has had wide application and has been reported on at length elsewhere (e.g., Rotter, 1966). The 29 items were used with the standard instructions. The reliability of the LOC, as indicated by Rotter, has varied from .69 to .79, for internal consistency, and from .55 to .83, for test-retest studies. The Intellectual Academic Responsibility scale (IAR), an LOC-type scale, was developed for students by Crandall, Katkovsky, and Crandall (1965). The IAR scale, however, considers

the student's perception of the source of a more specific class of reinforcement--academic behavior. As with the LOC, each of the 20 items on the IAR requires the S to make a choice between 2 alternatives. For example, after reading "If a teacher passes you to the next grade, would it probably be," the following choices would be given: "a. because she likes you, or b. because of the work you did?" There are two scores for the IAR, one for the degree of internal beliefs for success (IAR+) and for the degree of internal beliefs for the failures (IAR-) one experiences academically. Internal consistency figures indicate that both the IAR+ (.60) and the IAR- (.60) are somewhat homogeneous, though it should be remembered that the brevity of the subscales militates against high split-half reliabilities. Test-retest figures for a 2 month period were in the .60's and .70's.

The Satisfactions Inventory. The author's SI comes closest in format, perhaps, to the Semantic Differential. In contrast to the Semantic Differential, however, the SI items and rating dimensions referents were presented in a less ambiguous fashion. As has been pointed out (Heise, 1969; Carroll, 1959), there are often ambiguous concept-scale interactions on the SD, e.g., the interpretation of the bi-polar scale Hard-Soft changes rather drastically depending on what concepts are being considered--BOULDER, ABORTION, CRIMINAL, ANGER or JOB. In addition, the question

as to whether or not one should rely on one's own experiences in filling out the SD is often left unanswered by both the instructions and by the lack of any definitions of the concepts. For example, when rating a noun like FAMILY, should you rate in terms of your own family experiences or in terms of some generalized notion of family? The instructions of the SI emphasized that one's own experiences with the list of persons, objects, or events were to be the basis for the ratings. Where pilot research indicated ambiguous reactions to any of the 23 SI items, clarifications as to the intended definition of the item was placed on the SI itself, e.g., MUSIC (listening to phonographs, radios, etc., not playing an instrument) or SPORTS (actual participation in sports in school and on your own). Also unlike the SD, the well established EPA dimensions were taken as a postulate, so that only 3 rating dimensions were used with the SI, in lieu of numerous bi-polar scales. The list of 23 SI items were thus rated 3 times, each time in a different partially randomized order (completely randomized orders were not done in order to make hand scoring of the SI feasible). The Ss rated each item on its Strength for influencing their daily behavior, on how much Value each item had for them, and on the Frequency of the influence. A 7 point graphic scale was used with verbal cues printed under each point; the Ss were instructed to make their

ratings directly on the SI. The Strength, Value, and Frequency ratings for the 23 items were made on separate pages. Descriptive statistics and reliability coefficients will be taken up in the Results section.

Smoking Questionnaire. A questionnaire consisting of 5 items assessed several aspects of the smoking behavior of each S. A trichotomy was established for the sample by separating them into 3 groups: Non-smokers, those Ss who have never smoked, other than one cigarette experimentally; Ex-smokers; and Smokers, those who smoke at least one cigarette per day. Other items asked whether pipes and cigars were also smoked, when the individual had started smoking, if the person had ever tried to stop smoking, and, if so, how many times. The final question was an open-ended one, asking the S to list whatever reasons he felt like offering to tell why he began smoking and why he had continued. In the same space, EX were instructed to list why they began and why they quit; NOS were asked to list why they have never began. While only the trichotomy of the Ss was used to establish a smoking code (Non-smokers = 0, Ex-smokers = 1, Smokers = 2), the remaining data never being analyzed, the additional items, especially the last question, lent a degree of face validity to the battery and thus were felt to be important enough to include them in the questionnaire.

A 35-item Likert-type scale developed by Johnson (1968) was also given to the Ss to assess their willingness to agree

with pro-smoking rationalizations. Examples of the items are, "To continue smoking is stupid", "Cigarette advertisements have been influential in inducing young people to smoke", and "The pleasures gained from smoking are not worth possible ill-effects". A 5 point scale was used to indicate the amount of agreement or disagreement with each item. Johnson reported test-retest coefficients of .76 and .57 for a 15 month period for a sample of college students and plumbers, respectively.

Procedures

All students present the day of the testing in the 3 sophomore health classes were asked to cooperate in a study of the "smoking behavior of young people". Each class was briefed on the importance and value of such cooperation. To encourage honesty, anonymity was insured by requiring no one to put his name on any of the scales. However, in order to have some means of identifying and matching scores for the retesting that was to follow, a code number was created by each S. A single letter of the alphabet followed by 2 digits was made by having each person first write down his middle initial along with the last 2 digits of his telephone number. In addition to this code number, the Ss were also asked to indicate their sex, age, and ethnic background. As a rough estimate of their academic achievement, the students were requested to provide their freshman grade point averages (GPA). While potentially useful information

existed in the school records, including accurate GPAs, access to such data would have meant that anonymity would have been lost.

After the preliminary remarks had been made, the Ss filled out the Smoking Questionnaire, with the author circulating to answer questions. When it became apparent that sufficient time had elapsed for all to respond to the questions, the Ss filled out the combined SAD-SD-FR scale. Following this, the author's SI was given after first familiarizing them with the manner in which the rating scale was to be used. After completing the ratings on each dimension, Ss were asked to check for hasty or inaccurate marks. The remaining scales, the LOC, Nettler's Alienation, IAR, Johnson's Smoking Rationalization, and Dean's Alienation, were next given, with the Ss answering on a separate IBM answer sheet. All had had prior experience with such devices in their classwork. To facilitate the administration of the battery, as found in the pilot studies, all the classes were administered the battery in the same order as listed above. Because of some time scheduling problems, the last class of students was instructed to work on Dean's Alienation scale during the last 10 minutes of their period in order to insure that a sizeable number responded to that scale.

The Auxiliary Data. Prior to gathering the primary data described above, a smaller class of 42 sophomores (21 Non-

smokers and 21 Smokers) had been tested the preceding academic year at the same high school. Essentially the same scales and testing procedure were used. The SI at that point was in a slightly different format. A 5-point scale was used and 22 items were included (BROTHERS and SISTERS had been put on that form; CHILDREN and ANIMALS were not included then). In addition to LOC, IAR, and two Alienation scales and the Smoking Questionnaire, several other scales were given but will not be reported here. During the summer session, 111 University of Hawaii undergraduate volunteers (an extra class point was given by their instructors for their participation) were given the 22-item SI. In addition the LOC, SAD-SD-FR scales were given. The third auxiliary sample was a class of 112 Ss, again University of Hawaii undergraduates attending the summer session. This sample was used solely to assess the test-retest reliability of the SI over a three-week interval.

CHAPTER III

RESULTS

Some of the basic data regarding the SI will be described first, followed by a consideration of the results found with the other personality measures. An examination will then be made of the utility of all the different variables in the discrimination of smoking behavior. At appropriate points in the presentation of the results the auxiliary data will be described. Tables of results dealing with these pilot data appear in the Appendix.¹

Characteristics of the SI

Of the total of 127 Ss, 12 were discarded from the analysis: one indicated by remarks on his battery that he did not want to cooperate; the remaining Ss fell in the difficult to classify category of being non-smokers but also admitted users of marijuana, as indicated on the SI ratings. While many of the 115 Ss have complete data on all variables, some have missing scores. The n in each set of data will be indicated, along with the different levels of significance, within the different sets of data. In all cases with the SI data, all 115 cases have complete data.

In Table 1, the means, medians, and standard deviations

¹All calculations reported for this research were made with the facilities of the Statistical & Computing Center, University of Hawaii, Honolulu.

TABLE 1

Summary of Means (M), Standard Deviations (SD), and Medians (Md)
of the SI Strength Ratings

By Sex and Smoking Behavior

	Females									Males								
	Non-smokers n=21			Ex-smokers n=11			Smokers n=16			Non-smokers n=31			Ex-smokers n=14			Smokers n=22		
	M	SD	Md	M	SD	Md	M	SD	Md	M	SD	Md	M	SD	Md	M	SD	Md
EATING	4.05	1.75	4	3.27	2.00	3	5.00	1.86	5	5.07	1.65	5	4.64	1.60	5	4.77	1.31	5
BOOKS	4.24	1.58	4	3.46	1.70	3	2.63	1.26	2	3.65	1.40	4	3.64	1.74	3	3.23	1.15	3
FRIENDS	5.71	1.15	6	5.18	1.47	6	5.94	.93	6	5.74	1.24	6	5.50	1.09	6	5.59	1.30	6
MUSIC	4.62	1.86	5	5.27	1.90	5	6.50	.89	7	4.71	1.77	5	4.79	2.01	5	4.75	1.58	5
SPORTS	3.29	1.77	3	3.55	1.81	4	3.69	1.70	3.5	5.45	1.65	6	4.64	1.34	4	4.82	1.47	4
SCHOOL	5.38	1.20	6	3.91	1.70	4	3.63	1.63	4	4.58	1.29	5	4.86	1.35	4	3.77	1.02	4
JOB	2.91	2.36	1	3.00	2.15	3	4.75	2.32	5	3.94	1.69	4	3.21	2.49	2	3.82	2.11	4
FATHER	6.05	1.16	6	5.64	2.01	7	5.56	1.59	6	6.32	1.35	7	5.43	1.87	6	5.27	1.98	6
HOBBIES	4.24	2.02	4	3.27	1.85	4	4.06	2.01	4	4.29	1.97	4	5.36	1.39	5	4.55	1.85	5
MONEY	4.91	1.30	5	4.36	2.06	5	5.50	1.75	6.5	5.39	1.43	5	5.71	1.38	6	5.59	1.33	6
SMOKING	1.05	.22	1	1.73	1.01	1	4.88	1.93	5	1.00	.00	1	1.79	1.12	1	4.09	1.60	4
CARS	3.43	1.86	4	4.18	1.88	5	5.50	1.71	6	5.13	1.61	5	5.07	1.64	5	5.50	1.34	6
MOTHER	6.10	1.26	7	5.45	2.07	6	6.00	1.41	7	6.55	.88	7	6.00	1.41	7	5.68	1.32	7
SLEEPING	4.57	1.54	4	4.64	1.75	5	4.31	1.74	4.5	5.00	1.61	5	5.64	1.28	6	5.00	1.41	5
TV	4.48	1.69	5	3.64	1.91	4	4.13	1.67	4	4.61	1.56	5	4.79	1.63	4.5	4.30	1.74	4
CHURCH	3.38	1.99	3	3.91	2.21	5	3.19	1.87	3	3.84	2.05	4	3.14	2.14	2.5	3.41	2.26	2
DRINKING	1.00	.00	1	2.00	1.79	1	3.81	2.40	4	1.61	1.52	1	2.93	2.30	1.5	3.73	2.25	4
MOVIES	3.43	1.72	3	2.18	1.08	2	4.31	1.66	4	4.07	1.26	4	4.50	1.61	4	3.50	1.57	4
RELATIVES	4.33	1.59	4	3.36	1.96	4	4.00	1.93	4	5.16	1.32	5	4.64	1.60	4	3.77	1.88	3
MARIJUANA	1.00	.00	1	2.64	2.62	1	3.13	2.75	1	1.00	.00	1	1.14	.54	1	1.96	1.62	1
DATING	3.24	2.12	2	3.36	2.06	3	6.06	1.18	6.5	3.87	1.84	4	3.86	2.18	4	4.36	1.65	4.5
CHILDREN	3.57	2.01	4	3.82	1.66	4	4.31	1.74	4	4.13	1.67	4	3.21	1.81	4	3.00	1.85	3
ANIMALS	4.33	1.96	5	3.73	2.24	5	3.25	1.61	3	4.06	1.61	4	3.57	1.95	4	3.32	1.91	3.5

are listed for all 23 items on the SI Strength ratings. The data are classified into six sex by smoking code groupings: Female Smokers, Female Ex-smokers, Female Non-smokers, Male Smokers, Male Ex-smokers, and Male Non-smokers. Tables 2 and 3 show the same information for the Value and Frequency ratings. In general, these Tables show that there was full usage of the entire range of ratings on the SI. Histograms were produced for all these groups. Most of the items had roughly normally distributed or rectangularly distributed histograms. The medians are shown in the Tables to give some estimate of the shape and direction of the distributions. The greatly skewed distributions occurred primarily for those items which one might expect to have non-normal distributions. For example, the distributions for such items as MONEY, FATHER, MOTHER, JOB and DATING are negatively skewed. On the other hand, the distributions for SMOKING, MARIJUANA, DRINKING and CHURCH are positively skewed, indicating, as might be expected, that most students assign rather low ratings to these items. There are also some noticeable differences in the distribution when the various sex by smoking code groups are considered, e.g., SPORTS and CARS are rectangularly distributed for females and negatively skewed for males. Several items on the Frequency ratings have truncated ranges, in comparison with the Strength and Value ratings. For example, no one indicated that he "never" or "rarely" ate (ratings of 1 or 2) or that he was "never" influenced by sleeping, money, mother or father.

TABLE 2

Summary of Means (M), Standard Deviations (SD), and Medians (Md)
of the SI Value Ratings

By Sex and Smoking Behavior

	Females									Males								
	Non-smokers n=21			Ex-smokers n=11			Smokers n=16			Non-smokers n=31			Ex-smokers n=14			Smokers n=22		
	M	SD	Md	M	SD	Md	M	SD	Md	M	SD	Md	M	SD	Md	M	SD	Md
EATING	4.43	1.36	4	4.46	1.64	4	4.88	1.50	5	5.23	1.28	5	5.50	1.35	6	5.05	1.25	5
BOOKS	4.71	1.42	4	3.82	1.83	3	2.50	1.37	3	3.84	1.29	4	3.78	1.63	4	3.27	1.61	3.5
FRIENDS	6.19	1.12	7	5.82	1.33	6	6.06	1.06	6	5.77	1.02	6	5.64	1.08	5.5	5.77	1.19	6
MUSIC	5.14	1.74	5	5.18	1.17	5	6.56	.63	7	4.97	1.62	5	5.14	1.66	5	5.09	1.41	5.5
SPORTS	3.76	1.76	4	4.09	2.07	4	3.50	1.90	4	5.45	1.61	6	4.79	1.42	4.5	4.82	1.65	4
SCHOOL	5.52	1.03	6	4.27	1.56	4	3.63	1.54	4	4.97	1.60	5	4.79	1.37	4	3.41	1.44	3.5
JOB	4.29	1.98	5	4.91	1.22	5	5.75	1.61	6.5	4.45	1.79	5	4.86	1.96	5.5	4.59	1.74	5
FATHER	6.57	.68	7	5.55	1.37	6	5.56	1.37	6	6.10	1.56	7	5.93	1.39	7	5.73	2.07	7
HOBBIES	4.33	1.71	4	3.82	1.89	3	3.69	1.96	3.5	4.45	1.63	4	4.79	1.37	5	4.46	2.04	5
MONEY	4.95	1.43	5	5.00	1.00	5	5.31	1.66	5.5	5.65	1.31	6	5.86	1.10	6	5.59	1.22	6
SMOKING	1.00	.00	1	2.36	2.25	1	4.38	1.82	4.5	1.00	.00	1	1.64	1.28	1	3.46	1.71	4
CARS	3.86	1.62	4	4.64	1.80	5	5.63	1.78	6	5.45	1.23	6	5.50	1.09	5.5	5.23	1.60	5.5
MOTHER	6.62	.67	7	5.91	1.70	7	5.75	1.84	7	6.39	.92	7	6.57	.94	7	6.41	.96	7
SLEEPING	4.86	1.42	5	4.73	1.90	5	4.25	1.61	4	5.10	1.27	5	5.64	1.01	6	4.96	1.13	5
TV	4.38	1.56	4	3.36	1.50	4	3.50	1.63	3	4.52	1.53	5	4.93	1.44	4.5	4.27	1.88	4
CHURCH	3.71	1.68	4	3.91	2.39	4	2.88	1.59	2	4.00	2.00	4	3.50	2.03	4	2.77	2.33	2
DRINKING	1.14	.48	1	2.46	2.21	1	3.63	2.31	4	1.65	1.68	1	2.50	2.10	1	3.50	2.11	4
MOVIES	3.95	1.32	4	2.73	1.35	3	4.31	1.62	4	4.10	1.33	4	4.07	1.44	4	3.68	1.70	4
RELATIVES	4.86	1.53	5	4.18	1.17	4	3.88	2.06	4	5.10	1.49	5	5.07	1.73	4.5	4.46	1.87	4.5
MARIJUANA	1.00	.00	1	2.55	2.21	1	3.19	2.81	1	1.00	.00	1	1.36	.93	1	1.91	1.77	1
DATING	3.86	1.91	4	4.64	1.86	5	6.19	1.05	6.5	4.29	1.79	4	3.86	1.92	4	4.64	1.53	4.5
CHILDREN	4.62	1.72	4	4.55	1.13	4	5.00	1.46	5	4.68	1.66	5	3.71	1.82	4	3.23	1.90	3
ANIMALS	4.52	1.60	4	4.27	2.20	4	3.25	1.61	3	4.65	1.60	4	3.79	1.63	4	3.14	1.70	3

TABLE 3

Summary of Means (M), Standard Deviations (SD), and Medians (Md)
of the SI Frequency Ratings
By Sex and Smoking Behavior

	Females									Males								
	Non-smokers n=21			Ex-smokers n=11			Smokers n=16			Non-smokers n=31			Ex-smokers n=14			Smokers n=22		
	M	SD	Md	M	SD	Md	M	SD	Md	M	SD	Md	M	SD	Md	M	SD	Md
EATING	4.67	1.35	4	5.00	1.34	5	5.38	1.63	5.5	5.32	1.25	5	5.00	1.30	4.5	5.36	1.09	5
BOOKS	4.38	1.56	4	3.64	1.50	3	2.75	1.18	2	3.61	1.20	3	3.64	1.65	3.5	3.23	1.31	3
FRIENDS	6.05	1.36	6	5.00	1.48	4.5	6.25	1.07	6	5.74	1.06	6	5.50	1.02	6	6.05	.95	6
MUSIC	5.14	1.65	5	4.91	1.04	5	6.44	.73	7	4.77	1.69	5	5.21	1.53	5	5.00	1.45	5
SPORTS	3.48	1.66	3	3.36	2.34	3	3.25	1.77	2.5	5.13	1.59	5	4.93	1.54	5	4.77	1.57	4
SCHOOL	6.00	1.14	6	4.73	2.15	3	4.38	1.93	3	5.03	1.35	4.5	5.07	1.27	4	4.41	1.68	3
JOB	3.19	2.16	3	2.82	1.47	2	4.50	2.00	5	3.90	1.99	4	3.93	2.13	4	3.82	1.74	4
FATHER	6.00	1.27	7	5.27	2.45	7	5.56	1.21	6	5.84	1.46	6	5.36	2.02	6	5.55	1.60	6
HOBBIES	4.33	1.74	4	3.18	1.94	3	3.06	1.29	3	4.36	1.80	4	4.79	1.48	4.5	3.96	2.30	4
MONEY	5.10	1.26	5	4.27	1.62	4	5.13	1.82	5	5.29	1.30	5	5.71	1.44	6	5.36	1.33	5
SMOKING	1.48	1.37	1	1.55	.52	2	5.00	1.83	5.5	1.07	.25	1	1.79	1.37	1	4.46	1.60	4
CARS	3.10	1.48	3	4.36	1.91	5	5.56	1.86	7	4.97	1.68	5	4.93	1.86	5	5.46	1.44	6
MOTHER	5.95	1.36	7	5.82	1.94	7	5.44	1.59	6	6.13	1.31	7	6.29	1.07	7	6.05	1.17	6.5
SLEEPING	4.86	1.15	4	4.46	1.81	4	4.50	1.41	4	5.07	1.09	5	5.36	.93	5	5.00	1.16	5
TV	4.57	1.69	4	3.36	1.50	4	3.94	1.53	4	4.45	1.36	4	4.86	1.46	4	4.50	1.60	4
CHURCH	3.38	1.88	3	3.91	2.07	4	2.69	1.14	2.5	3.74	2.10	4	3.14	2.03	3	2.91	2.05	2
DRINKING	1.24	.70	1	1.36	.92	1	3.44	3.19	3	1.81	1.76	1	2.14	1.70	1	3.59	2.02	4
MOVIES	3.62	1.80	3	2.55	1.21	2	4.31	1.78	4.5	3.94	1.26	4	3.71	1.59	4	3.50	1.47	3.5
RELATIVES	4.71	1.45	5	3.27	1.68	3	3.88	1.86	4	4.81	1.47	5	4.36	1.34	4	3.96	1.65	4
MARIJUANA	1.14	.66	1	1.82	1.60	1	2.94	2.49	1	1.61	.90	1	1.14	.36	1	2.00	1.77	1
DATING	2.76	1.81	2	4.46	1.81	5	5.81	1.60	6	3.07	1.79	3	2.93	1.98	2	4.00	1.60	4
CHILDREN	3.62	1.99	4	4.18	1.66	4	3.94	1.65	4	4.29	1.77	5	3.29	1.68	3.5	2.96	1.99	2.5
ANIMALS	4.19	2.09	4	3.73	2.15	3	2.69	1.40	2	4.36	1.58	4	3.71	1.33	3.5	3.14	1.81	2.5

The Strength and Value ratings, however, covered the entire 7-point range on these items.

Table 4 shows the relationship of ratings across the three rating dimensions for each of the 23 SI items. It should be noted that several of the items have consistently high correlations across all three possible dyad combinations, while other items are consistently lower. In Table A, Appendix, the same coefficients are given for the auxiliary college data. As found with the high school data, the college Ss tended to have lower correlations on such items as EATING, SLEEPING, FATHER and MONEY, especially for the Value-Frequency correlations. Also, the highest correlations are on many of the same items, e.g., HOBBIES, SPORTS, MARIJUANA, TELEVISION and CHURCH.

Tables 5, 6, and 7 indicate the intercorrelation of the 23 SI items for each of the rating dimensions separately. Squared multiple correlations are entered in the diagonals of each matrix and serve as an index of the amount of variance which each item shares with the remaining 22 items. On the average, slightly less than half (.45) of the variance of each was shared variance. The smallest shared variance value occurred quite uniformly with the item JOB (mean of .25); the highest was for SMOKING (.61). Other items with squared multiple correlations over .50 were TELEVISION, DRINKING, RELATIVES and CHILDREN.

Approximately a quarter of the Value (24%) and Frequency

TABLE 4

Intercorrelations of the Three Rating Dimensions of the SI*

Dyads

	Strength- Value	Value- Frequency	Frequency- Strength
EATING	.619	.639	.551
BOOKS	.771	.748	.780
FRIENDS	.550	.664	.495
MUSIC	.709	.759	.658
SPORTS	.781	.820	.759
SCHOOL	.578	.534	.439
JOB	.533	.561	.696
FATHER	.672	.623	.695
HOBBIES	.736	.792	.767
MONEY	.606	.625	.547
SMOKING	.796	.722	.782
CARS	.693	.587	.669
MOTHER	.450	.546	.491
SLEEPING	.729	.447	.453
TV	.737	.796	.719
CHURCH	.732	.696	.722
DRINKING	.811	.813	.804
MOVIES	.712	.664	.644
RELATIVES	.687	.730	.728
MARIJUANA	.912	.787	.702
DATING	.792	.559	.632
CHILDREN	.676	.666	.686
ANIMALS	.775	.836	.729

*All r's are significant at the .001 level (n=115)

TABLE 5
 Inter-item Correlations for the SI Strength Ratings*
 n = 115

	EAT	BKS	FRD	MUS	SPT	SCH	JOB	FTR	HOB	\$	SMO	CAR	MOM	SLP	TV	CHR	DRK	MOV	REL	POT	DAT	CLD	ANM	
EAT	<u>49</u>																							
BKS		<u>44</u>																						
FRD	35		<u>46</u>																					
MUS	33		<u>28</u>	<u>42</u>																				
SPT	42		30		<u>44</u>																			
SCH	33	50				<u>49</u>																		
JOB	29						<u>30</u>																	
FTR			38					<u>48</u>																
HOB									<u>29</u>															
\$	45		36	33	29		26		<u>34</u>	<u>49</u>														
SMO		-26		29		-37					<u>62</u>													
CAR	30		25	34	43				26	44		<u>49</u>												
MOM			31		28	29		55				<u>27</u>	<u>52</u>											
SLP	39		35		39				30	38		<u>43</u>	<u>35</u>	<u>49</u>										
TV	26			34					30	44		25		<u>36</u>	<u>50</u>									
CHR					28			31					37	28	<u>50</u>	<u>33</u>								
DRK										27	60							<u>59</u>						
MOV	29		27	28	34		28			38		40		31	50			<u>25</u>						
REL	28		32		28		32	43		30		32	49	35	30				<u>36</u>					
POT								-28			55									<u>55</u>				
DAT	32		33	30	31		26				39	36				-26	50			-27	<u>47</u>			
CLD			34		34		30					29	35		26	31	39	35				<u>52</u>		
ANM		30				33	30															<u>38</u>	<u>54</u>	<u>42</u>
																							<u>43</u>	
																								<u>42</u>

Squared multiple correlations are in the diagonal of matrix

*An r of .18 is significant at the .001 level

Note: The abbreviations used here represent the same items in the same order as listed in the previous tables. Decimal points have been omitted. F
O

(25%) correlations were significant at the .01 level, and over a third significant at that level for the Strength data (38%). Those individuals assigning high ratings for the item DRK also tended to assign similar ratings to the items SMOKING, MARIJUANA, and DATING (mean r's for all three dimensions for these items were .58, .45, and .35, respectively). BOOKS and SCHOOL both correlated consistently with each other (average $r = .44$) and both were negatively related to SMOKING Strength and Value ratings (mean r's of $-.31$ for BOOKS and $-.41$ for SCHOOL). Other items positively related are RELATIVES with FATHER; MOTHER and CHILDREN; MOVIES with CARS; TELEVISION and DATING; MONEY with EATING, HOBBIES, CARS, and MOVIES; and SPORTS with EATING and SLEEPING.

The correlation matrices were submitted to a factor analysis routine (Dixon, 1968) and the resulting factor matrices, after orthogonal rotation, appear in Tables 8, 9, and 10. Squared multiple correlations were entered as diagonal elements for factoring and the "latent root of one" criterion (Harman, 1967) was used to determine the number of factors to be extracted. Similar factors were found for all three correlation matrices, especially for the Strength and Frequency data. The Value data, in addition to having three factors quite similar to the three factors found in the other two data matrices, had an additional fourth factor.

The first factor of both the Strength and Frequency data and the third Value factor were all consistently defined by

TABLE 8
 Factor Matrix for the SI Strength Ratings
 (Loadings Within $\pm .20$ omitted)

	Factors		
	I	II	III
EATING	.28		.55
BOOKS		-.49	.29
FRIENDS	.43		.30
MUSIC		.25	.44
SPORTS	.40		.42
SCHOOL		-.50	.27
JOB	.34		.25
FATHER	.60	-.22	
HOBBIES			.48
MONEY		.78	
SMOKING			
CARS	.36	.24	.47
MOTHER	.67		
SLEEPING	.33		.52
TV			.66
CHURCH	.47	-.22	
DRINKING		.65	.35
MOVIES			.59
RELATIVES	.61		.29
MARIJUANA	-.24	.58	
DATING	.39	.50	.25
CHILDREN	.60		
ANIMALS	.30		.33

TABLE 9
 Factor Matrix for the SI Value Ratings
 (Loadings Within $\pm .20$ omitted)

	Factors			
	I	II	III	IV
EATING	.58			
BOOKS		-.44		.37
FRIENDS			.43	
MUSIC		.32		
SPORTS	.43		.25	
SCHOOL		-.48		.50
JOB				.42
FATHER			.57	
HOBBIES	.33			.30
MONEY	.62			.23
SMOKING		.68	-.26	
CARS	.43	.36	.20	
MOTHER			.55	
SLEEPING	.71		.28	
TV	.62		.35	
CHURCH			.53	.21
DRINKING		.72		
MOVIES	.45	.30	.32	
RELATIVES			.70	
MARIJUANA		.52	-.43	-.20
DATING		.47		.32
CHILDREN		.22	.50	.56
ANIMALS	.25		.23	.48

TABLE 10
 Factor Matrix for the SI Frequency Ratings
 (Loadings Within $\pm .20$ omitted)

	Factors		
	I	II	III
EATING			.51
BOOKS	.21	-.22	.48
FRIENDS			.40
MUSIC		.36	
SPORTS	.27		.35
SCHOOL		-.24	.40
JOB	.32	.27	
FATHER	.53		
HOBBIES	.40		.39
MONEY		.31	.60
SMOKING	-.25	.78	
CARS		.42	.23
MOTHER	.48		
SLEEPING	.28		.54
TV	.37		.50
CHURCH	.45		
DRINKING		.73	
MOVIES	.41	.26	.31
RELATIVES	.67		
MARIJUANA	-.26	.52	
DATING	.23	.61	
CHILDREN	.61		
ANIMALS	.60		.25

high loadings on RELATIVES, FATHER, MOTHER and CHILDREN. Such loadings suggest a "Kinship Approach" factor. The low negative loadings of MARIJUANA and SMOKING on this factor should be noted.

The second factor, for all three matrices, had its highest positive loadings on SMOKING, DRINKING, MARIJUANA, and DATING, with negative loadings on SCHOOL and BOOKS. Many labels could be attached to this second factor; the one that will be used here is "Sensual Orientation", because of the high weighting by stimulants and the avoidance of academics.

The items MONEY, TELEVISION, SLEEPING, EATING and MOVIES were all loaded highly on the third factors extracted from both the Frequency and Strength data and the first factor of the Value ratings. Also helping to define this factor were the items CARS, SCHOOL, BOOKS, FRIENDS, SPORTS, and HOBBIES. The many items defining this factor make labeling it difficult. There is a wider base of interests here, including positive evaluation of academic affairs, others, and a variety of physical activities. "Youthful Zest" will be used here as a descriptive tag for this factor. The fourth factor on the Value data appeared to be a composite of the first factors from both the Strength and Frequency matrices. Its highest loadings were on the items CHILDREN, SCHOOL, ANIMALS and JOB. These positive interests in school, younger children, animals, and working are seen here as reflecting an "other-centered" orientation, as opposed, say, to being more self-centered.

Thus, the four labels that will be used to refer to factors found in the Value matrix are: "Kinship Approach", "Sensual Orientation", "Youthful Zest", and "Other-Centered".

The auxiliary high school and college data were also factor analyzed (Value ratings only) and the results appear in the Appendix, Tables B and C. Compared with the primary high school factors (Table 9), several of the labels listed above appeared to be plausible descriptions for these other samples. The "Youthful Zest" seemed appropriate for the high school factor V and college factor IV. What was meant by "Sensual Orientation" was clearly definable by high school I, while in the college data the importance of items SMOKING, MARIJUANA and DRINKING was very slight. The "Kinship Approach" factor definitely was reestablished in college I, less clearly by high school VI and II. The "Other-Centered" factor was difficult to find, mainly because two important items were not included on the form of the SI given the earlier samples: ANIMALS and CHILDREN. High school III is suggestive, however, of what was originally implied by the label "Other-Centered".

Reliability of the SI

To provide some index of the stability of the SI ratings over time, it was administered again to one of the three high school classes (n = 40) after an interval of six weeks. Table 11 lists the test-retest correlations for each of the 23 items by each rating dimension. The mean correlation of the 69 coefficients was .63. (The mean correlation found with the

TABLE 11

Six Week Test-Retest Reliability Coefficients for the SI
(n=40)

	Single Item by Rating Dimension			Mean Correlation
	Strength	Value	Frequency	Across All Three Dimensions
EATING	.67	.62	.63	.64
BOOKS	.76	.67	.71	.70
FRIEND	.37	.86	.71	.64
MUSIC	.60	.65	.68	.64
SPORTS	.86	.72	.82	.80
SCHOOL	.60	.77	.56	.64
JOB	.50	.44	.67	.54
FATHER	.66	.75	.78	.73
HOBBIES	.58	.68	.72	.66
MONEY	.60	.53	.47	.53
SMOKING	.79	.76	.74	.76
CARS	.58	.45	.46	.50
MOTHER	.35	.84	.35	.51
SLEEPING	.38	.48	.37	.41
TV	.55	.67	.73	.65
CHURCH	.62	.88	.76	.72
DRINKING	.71	.73	.77	.71
MOVIES	.41	.55	.45	.47
RELATIVES	.64	.58	.74	.65
MARIJUANA	.66	.71	.68	.68
DATING	.71	.83	.60	.71
CHILDREN	.44	.66	.57	.56
ANIMALS	.63	.66	.76	.68
MEAN CORRELATION	.59	.67	.64	.63

		Summary Scores* by Rating Dimensions								
		Strength Test			Value Test			Frequency Test		
		SMO	NOS	SUM	SMO	NOS	SUM	SMO	NOS	SUM
<u>RETEST</u>	SMO	.73	.14	.48	.79	.21	.66	.73	.34	.64
	NOS	.35	.55	.52	.02	.85	.63	.22	.63	.48
	SUM	.63	.42	.59	.47	.72	.82	.53	.54	.64

*SMO="Smoking-type" summary score; NOS="Non-smoking-type" summary score; SUM="Total" summary score.

college reliability study, using an earlier form of the SI on a three-week interval, was .57 for all 22 items over the 3 rating dimensions.

The reliability values for the Value ratings were higher, on the average, than for the other two dimensions. When three summary scores were created for the SI, the magnitude of the Value reliability coefficients became even more superior. The three summary scores were based on the simple, a priori distinction that had been suggested in the Introduction, that is, sums were created for each S by adding the ratings on all the so-called "smoking-type" items (EATING, SMOKING, CARS, SLEEPING, TELEVISION, DRINKING, MOVIES AND MARIJUANA), the "non-smoking-type" items (the remaining 15 items), and by summing all 23 items. The highest stability figures again occur for the Value ratings. Over the six-week interval, the Value ratings for the "smoking-type" sum correlated .79; "non-smoking-type" summary scores correlated .85, while the "total" was .82. A reliability coefficient based on all SI items was computed for the college test-retest sample and was found to be comparable, .74.

Discriminant Analyses of the SI Data

The statistical procedure of discriminant analysis was chosen as the mode of analysis of both qualitative and quantitative differences in the ratings given by non-smokers and smokers on the SI, and the efficacy of the various personality measures, including the SI, in discriminating the same

two groups.

Fisher (1936) proposed the concept of the discriminant function to handle the problem involved when one is interested in finding a linear combination of variables which, better than any other linear combination, would discriminate between two, or more, chosen groups. Such traditional correlational analyses as the Pearsonian R, multiple regression analysis or factor analysis could not be used as a basis for distinguishing groups. For example, multiple regression analysis focuses only on within group differentiation, between group differences are not contrasted.² The discriminant function was the term used by Fisher to refer to the optimum linear combination that would maximize the ratio of between-groups variance to the within-groups variance. Multiple discriminant analysis allows for the use of group membership as a dependent variable without arbitrarily scaling the groups in some manner along an ordered continuum. Thus, as some researchers have pointed out (Straits, 1967; Tiedeman, Bryon & Rulon, 1952; and Lubin, 1951) discriminant analysis is an appropriate statistic when one is concerned about demonstrating relationships between quantitative predictors and qualitative criterion variables, which is precisely the interest in the present study.

²The discriminant function for two groups is proportional, however, to the point-biserial multiple regression function predicting to a "dummy" criterion variable showing group membership.

In the present analysis, a variant of the multiple discriminant analysis procedure was used. A step-wise multiple discriminant analysis program was used (Dixon, 1968) which proceeded in a step-wise fashion by forming linear sums of first one, then two, three, etc., variables. At each step the variable added was the one which gave the greatest improvement in classification. This step-wise program thus helped to determine the relative importance of different variables in distinguishing among groups.

The program tests the significance of adding a variable to a set of independent variables after removing the effect of previously entered variables by covariance analysis. In the first step, group means, standard deviations, within group and total cross products and within groups covariance and correlation matrices are computed. Discriminant functions are then determined for each pair of groups for each independent variable and an F ratio is given to test for significant differences between each pair of groups and for each variable entered or not entered at that step. The variable to be added or removed from the discriminating set at each step is determined according to one of the following equivalent rules: a) the variable with the largest F, or b) the variable which when partialled on previously entered variables has the highest multiple R with the groups, or c) the variable which gives the greatest decrease in the ratio of within to total generalized variances. If no variable

satisfies any of these rules the computation process is terminated.

In the tables that will be discussed, the step-wise discriminant analysis will be reported in terms of the results found at each step. At each step, the variable entered will be indicated, along with the F test when that step was entered into the discriminant set. Only those steps where the F to enter is significant at the .10 level or better will be reported. The number of cases classified into the different groups when the discriminant function is used to predict group membership will be included in each table. The classification procedure used here involves squaring the Mahalanobis distance, a generalized form of the distance separating pairs of the different groups. A non-parametric test of the significance of this classification table will be shown. This statistic, developed by Lubin (1951), depends on the t ratio test for the difference between two percentages. A final entry that will be found in each table is the F test for all variables included in the analysis, i.e., this is the test of significance that is often reported in a regular, non-step-wise multiple discriminant analysis. This F indicates whether on the basis of all the variables included in the analysis it is possible to significantly discriminate between the various groups.

Comment should be made as to the order in which the data were analyzed and will be reported on here. The

preliminary concern was whether the SI items (minus, of course, the items SMOKING and MARIJUANA) could significantly discriminate the smokers from non-smokers, and if so, what items were most responsible for this discriminatory power of the SI. Each rating dimension was analyzed separately. Next, to test for the utility of the SI in discriminating between other possible groupings, e.g., male and female, or female smokers and female non-smokers, or male smokers and male non-smokers, further exploratory analyses were made. In later sections, discriminant analyses were computed with the SI and the other personality measures.

Tables 12, 13, and 14 show the results of the step-wise analysis for smoking and non-smoking groups for the Strength, Value, and Frequency ratings, respectively. From Table 12 it can be seen that a total of seven items had significant F's to enter ($p < .05$) in discriminating smokers from non-smokers when the ratings were made on the basis of how much Strength each SI item was felt to influence one's behavior. The remaining 14 items did not have significant F's to enter the set defining the discriminant function already determined by the initial set of seven items. None of the F's to enter from the eighth step on was significant at the .10 level. The discriminating items, in terms of the descending order of the step entered into the discriminant function, were DRINKING, SCHOOL, RELATIVES, JOB, DATING, SPORTS, and CARS. The F value for all 21 variables was 5.82 ($p < .001$, $df = 21$ and 68).

TABLE 12

Step-wise Discriminant Analysis of SI Strength Ratings

(Smoking and Marijuana Omitted)

Non-smokers (NOS) and Smokers (SMO)
(n=52) (n=38)

	Means		Standard Deviations		Step Entered	F Value to Enter (df)	p
	NOS	SMO	NOS	SMO			
EATING	4.65	4.87	1.75	1.55			
BOOKS	3.88	2.98**	1.49	1.22			
FRIENDS	5.74	5.74	1.19	1.16			
MUSIC	4.67	5.47**	1.79	1.59			
SPORTS	4.58	4.34	1.99	1.65	6	5.19 (1,83)	.05
SCHOOL	4.90	33.71***	1.30	1.29	2	11.40 (1,87)	.005
JOB	3.52	4.21	2.03	2.22	4	8.34 (1,85)	.01
FATHER	6.21	5.39**	1.27	1.81			
HOBBIES	4.30	4.34	1.97	1.91			
MONEY	5.19	5.55	1.39	1.50			
CARS	4.44	5.50**	1.89	1.48	7	8.03 (1,82)	.01
MOTHER	6.37	5.82**	1.07	1.35			
SLEEPING	4.83	4.71	1.58	1.58			
TV	4.56	4.34	1.60	1.70			
CHURCH	3.65	3.32	2.02	2.08			
DRINKING	1.37	3.76***	1.21	2.28	1	41.62 (1,88)	.001
MOVIES	3.81	3.84	1.48	1.64			
RELATIVES	4.83	3.87**	1.48	1.88	3	5.94 (1,86)	.025
DATING	3.62	5.08***	1.96	1.68	5	4.76 (1,84)	.05
CHILDREN	3.90	3.55	1.82	1.90			
ANIMALS	4.17	3.29**	1.74	1.77			

Mean Difference: *= $p < .10$, **= $p < .05$, ***= $p < .001$
 All 21 Variables: $F=5.82$, $df=21,68$ ($p < .001$)

Number of Cases Classified Into Groups:

	NOS	SMO	
NOS	50	2	Lubin's $t = 7.45$ ($p < .001$)
SMO	6	32	91% accuracy

TABLE 13

Step-wise Discriminant Analysis of SI Value Ratings

(Smoking and Marijuana Omitted)

Non-smokers (NOS) and Smokers (SMO)
(n=52) (n=38)

	Means		Standard Deviations		Step Entered	F Value to Enter (df)	p
	NOS	SMO	NOS	SMO			
EATING	4.90	4.97	1.36	1.35			
BOOKS	4.19	2.95***	1.40	1.54			
FRIENDS	5.94	5.89	1.07	1.13			
MUSIC	5.04	5.71**	1.66	1.35	7	3.26 (1,82)	.10
SPORTS	4.77	4.26	1.85	1.86			
SCHOOL	5.19	3.50***	1.41	1.47	6	5.94 (1,83)	.025
JOB	4.38	5.08*	1.85	1.76	5	4.07 (1,84)	.05
FATHER	6.29	5.66*	1.29	1.79			
HOBBIES	4.40	4.13	1.65	2.20			
MONEY	5.37	5.47	1.39	1.41			
CARS	4.81	5.40*	1.60	1.67			
MOTHER	6.48	6.13	.83	1.42	9	2.89 (1,80)	.10
SLEEPING	5.00	4.66	1.33	1.38			
TV	4.46	3.95	1.53	1.80	8	3.85 (1,81)	.10
CHURCH	3.88	2.82**	1.86	2.02			
DRINKING	1.44	3.55***	1.35	2.16	1	32.32 (1,88)	.001
MOVIES	4.04	3.95	1.31	1.68			
RELATIVES	5.00	4.21**	1.50	1.95			
DATING	4.11	5.29**	1.83	1.54	3	8.30 (1,86)	.01
CHILDREN	4.65	3.97*	1.67	1.92	4	6.88 (1,85)	.025
ANIMALS	4.60	3.18***	1.59	1.64	2	24.28 (1,88)	.001

Mean Difference: *=p<.10, **=p<.05, ***=p<.001
 All 21 Variables: F=5.94, df=21,68 (p<.001)

Number of Cases Classified Into Groups:

	NOS	SMO	
NOS	49	3	Lubin's t = 7.53 (p<.001)
SMO	5	33	91% accuracy

TABLE 14

Step-wise Discriminant Analysis of SI Frequency Ratings

(Smoking and Marijuana Omitted)

Non-smokers (NOS) and Smokers (SMO)
(n=52) (n=38)

	Means		Standard Deviations		Step Entered	F Value to Enter (df)	p
	NOS	SMO	NOS	SMO			
EATING	5.06	5.37	1.32	1.32			
BOOKS	3.92	3.03**	1.40	1.26			
FRIENDS	5.87	6.13	1.18	.99			
MUSIC	4.92	5.61**	1.67	1.39			
SPORTS	4.46	4.13	1.80	1.80	6	2.73 (1,83)	.10
SCHOOL	5.42	4.39**	1.35	1.76	5	3.33 (1,84)	.10
JOB	3.62	4.11	2.07	1.86			
FATHER	5.90	5.55	1.38	1.43			
HOBBIES	4.35	3.58**	1.76	1.97			
MONEY	5.21	5.26	1.27	1.54			
CARS	4.21	5.50***	1.84	1.62	4	4.09 (1,85)	.05
MOTHER	6.06	5.79	1.32	1.28			
SLEEPING	4.98	4.79	1.11	1.28			
TV	4.50	4.26	1.49	1.57			
CHURCH	3.60	2.82**	2.00	1.71			
DRINKING	1.58	3.53***	1.45	2.06	1	27.79 (1,88)	.001
MOVIES	3.81	3.84	1.50	1.64			
RELATIVES	4.77	3.92**	1.45	1.71			
DATING	2.94	4.76***	1.79	1.82	3	17.16 (1,86)	.001
CHILDREN	4.02	3.37	1.87	1.89			
ANIMALS	4.29	2.95***	1.79	1.64	2	16.67 (1,87)	.001

Mean Difference: *=p<.10, **=p<.05, ***=p<.001
 All 21 Variables: F=4.70, df=21,68 (p<.001)

Number of Cases Classified Into Groups:

	NOS	SMO	
NOS	48	4	Lubin's t = 7.57 (p<.001)
SMO	4	34	91% accuracy

The classification of cases into smoking and non-smoking groups on the basis of the resultant discriminant function was 93% accurate, i.e., six non-smokers and two smokers were misclassified. Lubin's t test of this classification table was significant at the .001 level, as was the F for the discriminative ability of the entire 21 items.

There were nine Value ratings (see Table 13) with demonstrated usefulness in discriminating between groups--DRINKING again was first, followed by ANIMALS, DATING, CHILDREN, JOB, SCHOOL, MUSIC, TELEVISION, and MOTHER. The F test for all 21 is again significant at the .001 level, as was the t test of the classification table, which shows that 91% of the Ss were accurately classified. The same level of significance and accuracy of classification was found for the Frequency data, Table 15, with virtually the same items being chosen at the same steps as with the Value ratings. DRINKING was again the first step, followed by ANIMALS, DATING, CARS, SCHOOL, and SPORTS.

In addition to these basic discriminant analyses, other groupings of the Ss were submitted to the step-wise procedure. Because of the apparent equivalency in the results of the Strength, Value, and Frequency ratings, only one set of data was chosen for these further analyses. The Value ratings were selected, not only because of their higher reliability coefficients, but also because it is felt that these ratings are perhaps easier to judge, both from the Ss'

view and from the standpoint of prior research. In the first regrouping analysis, smoking behavior was ignored and sex was used as the basis for creating groups. The rationale for this procedure was to see whether the SI items could discriminate between the sexes and, if so, would the items be different from those items important for classifying smokers and non-smokers? As demonstrated by Table 15, not only did the Value ratings on the SI significantly discriminate males from females, but the six steps with F's to enter significant at the .05 level or better included mainly new items: SPORTS, CHILDREN, MARIJUANA, CARS, MUSIC, and EATING. (When the college auxiliary data were analyzed in the same fashion, many of the same items were found to be important in discriminating between the sexes: SPORTS, CARS, CHURCH, MOVIES, and MUSIC--see Table D, Appendix). Classification on the basis of the entire SI resulted in 85% accuracy for the discriminant function. Both the F test for the entire battery and the t test of the classification table were significant beyond the .001 level. Looking at the direction of the mean differences between males and females, the males placed higher value, as might be expected, on SPORTS, CARS, and EATING, while the females assigned higher value ratings for CHILDREN, MUSIC, and DATING. Contrary, however, to what one might have expected, females assign higher ratings to both MARIJUANA and SMOKING than did the males. Of the three items SMOKING, MARIJUANA, and DRINKING, males gave higher

TABLE 15

Step-wise Discriminant Analysis of SI Value Ratings

Females (FEM) and Males (MAL)
(n=47) (n=68)

	Means		Standard Deviations		Step Entered	F Value to Enter (df)	p
	FEM	MAL	FEM	MAL			
EATING	4.55	5.24**	1.46	1.27	6	2.86 (1,108)	.10
BOOKS	3.70	3.69	1.72	1.52			
FRIENDS	6.04	5.76	1.14	1.08			
MUSIC	5.62	5.06*	1.48	1.53	5	3.51 (1,109)	.10
SPORTS	3.72	5.10***	1.86	1.58	1	18.24 (1,113)	.001
SCHOOL	4.57	4.44	1.57	1.64			
JOB	4.89	4.60	1.81	1.78			
FATHER	5.98	5.96	1.21	1.69			
HOBBIES	4.00	4.51	1.84	1.70			
MONEY	5.09	5.66**	1.43	1.22			
SMOKING	2.47	1.93	2.09	1.56			
CARS	4.62	5.38**	1.87	1.32	4	5.72 (1,110)	.025
MOTHER	6.17	6.43	1.45	.92			
SLEEPING	4.62	5.16**	1.61	1.18			
TV	3.85	4.51**	1.63	1.62			
CHURCH	3.47	3.50	1.86	2.14			
DRINKING	2.30	2.41	2.02	2.05			
MOVIES	3.79	3.96	1.55	1.46			
RELATIVES	4.38	4.87	1.70	1.67			
MARIJUANA	2.11	1.37**	2.15	1.14	3	8.24 (1,111)	.01
DATING	4.89	4.26*	1.86	1.77			
CHILDREN	4.74	4.00**	1.51	1.85	2	11.82 (1,112)	.001
ANIMALS	4.00	4.00	1.81	1.75			

Mean Difference: *=p < .10, **=p < .05, ***=p < .001
All 23 Variables: F=3.11, df=23,91 (p < .001)

Number of Cases Classified Into Groups:

FEM	42	5	Lubin's t = 7.03 (p < .001)
MAL	12	56	

85% accuracy

TABLE 16

Step-wise Discriminant Analysis of SI Value Ratings

(Smoking and Marijuana Omitted)

Female Non-smokers (FEMNO) and Female Smokers (FEMSMO)
(n=21) (n=16)

	Means		Standard Deviations		Step Entered	F Value to Enter (df)	p
	FEMNO	FEMSMO	FEMNO	FEMSMO			
EATING	4.43	4.88	1.36	1.50			
BOOKS	4.71	2.50***	1.42	1.37	2	8.14 (1,34)	.01
FRIENDS	6.19	6.06	1.12	1.05			
MUSIC	5.14	6.56**	1.74	.63			
SPORTS	3.76	3.50	1.76	1.90			
SCHOOL	5.52	3.63***	1.03	1.54			
JOB	4.29	5.76**	1.98	1.61	5	5.22 (1,31)	.05
FATHER	6.57	5.56**	.68	1.36			
HOBBIES	4.33	3.69	1.71	1.95			
MONEY	4.95	5.31	1.43	1.66			
CARS	3.86	5.63**	1.62	1.78	10	4.05 (1,26)	.10
MOTHER	6.62	5.75**	.67	1.84			
SLEEPING	4.86	4.25	1.42	1.61			
TV	4.38	3.50	1.66	1.63	3	5.93 (1,33)	.025
CHURCH	3.71	2.88	1.68	1.59			
DRINKING	1.14	3.63***	.48	2.31	1	23.22 (1,35)	.001
MOVIES	3.95	4.31	1.32	1.62			
RELATIVES	4.86	3.88	1.53	2.06			
DATING	3.86	6.19***	1.90	1.05	4	11.78 (1,32)	.005
CHILDREN	4.62	5.00	1.72	1.46			
ANIMALS	4.52	3.25**	1.60	1.61			

Mean Difference: *=p<.10, **=p<.05, ***=p<.001
 All 21 Variables: F=6.24, df=21,15 (p<.001)

Number of Cases Classified Into Groups:

	FEMNO	FEMSMO	
FEMNO	21	0	Lubin's t = 5.95 (p<.001)
FEMSMO	0	16	100% accuracy

value ratings only for the last item. Both sexes rate SMOKING, MARIJUANA, and DRINKING as their lowest valued items, however.

The smoking and non-smoking division was again analyzed, this time within each sex separately. Table 16 shows which of the 21 items (MARIJUANA and SMOKING were again excluded) were most useful in discriminating between female smokers and female non-smokers. DRINKING, BOOKS, TELEVISION, DATING, JOB, and CARS constitute the important discriminators here. Of these six items, the non-smoking females valued only two higher than did the smoking females: BOOKS and TELEVISION. Some of the qualitative differences should be emphasized for these data. For example, when the four items valued most and least are compared for the two groups, non-smokers rated MOTHER, FATHER, FRIENDS, and SCHOOL highest; DRINKING, CHURCH, SPORTS, and CARS-DATING (tie) were rated the lowest. Smokers, on the other hand, rated MUSIC, DATING, FRIENDS, and JOB highest, while BOOKS, CHURCH, ANIMALS, and SPORTS-TELEVISION (tie) were rated lowest. Also, though SMOKING and MARIJUANA were not included in the discriminant set, it should be noted that both items would have had the lowest ranking for the non-smokers (1.00 Value ratings for both), while MARIJUANA would have ranked 21st (3.19) and SMOKING 14th (4.38) for the smokers.

There were enough females in the college auxiliary sample to do the same analysis (Table E, Appendix). Many of

the items important for the high school data were not found with the college sample. The four items significant for the college females analysis were FRIENDS, SCHOOL, HOBBIES, and CHURCH. DATING and DRINKING did not have the discriminative utility for this sample, as it had for the high school females. Also, when the means for SMOKING and MARIJUANA were ranked, smokers and non-smokers assigned both items low ratings, i.e., in the lowest four.

The set of items chosen by the discriminant analysis for the male smoker and male non-smoker division (Table 17) included SCHOOL, DRINKING, ANIMALS, BOOKS, SPORTS, DATING, MOVIES, and MUSIC, all F's to enter significant at the .10 level. With only minor rearranging of the order, both groups valued MOTHER, FRIENDS, FATHER, MONEY, and CARS most. There were, however, important differences in what they rated least. Smokers rated CHURCH, ANIMALS, CHILDREN, BOOKS, and SCHOOL the lowest; non-smokers rated DRINKING, BOOKS, CHURCH, MOVIES and DATING lowest. Both groups rated MARIJUANA the lowest, when that item was compared with all SI items. When SMOKING was ranked for smokers it appeared 17th, ahead of such items as SCHOOL, BOOKS, CHILDREN, ANIMALS, and CHURCH.

The SI and the Other Personality Measures

In Table 18, the intercorrelation of the 23 SI items and the nine additional personality test scores are presented. Also included in the matrix are five demographic items and

TABLE 17
 Step-wise Discriminant Analysis of SI Value Ratings
 (Smoking and Marijuana Omitted)
 Male Non-smokers (MALNO) and Male Smokers (MALSMO)
 (n=31) (n=22)

	Means		Standard Deviations		Step Entered	F Value to Enter (df)	p
	MALNO	MALSMO	MALNO	MALSMO			
EATING	5.23	5.05	1.28	1.25			
BOOKS	3.84	3.27	1.29	1.61	4	3.39 (1,48)	.10
FRIENDS	5.77	5.77	1.02	1.19			
MUSIC	4.97	5.09	1.62	1.41	8	3.41 (1,44)	.10
SPORTS	5.45	4.82	1.61	1.65	5	3.86 (1,47)	.10
SCHOOL	4.97	3.41**	1.60	1.44	1	13.25 (1,51)	.001
JOB	4.45	4.59	1.79	1.74			
FATHER	6.10	5.73	1.56	2.07			
HOBBIES	4.45	4.45	1.63	2.04			
MONEY	5.65	5.59	1.31	1.22			
CARS	5.45	5.23	1.23	1.60			
MOTHER	6.39	6.41	.92	.96			
SLEEPING	5.10	4.95	1.27	1.13			
TV	4.52	4.27	1.52	1.88			
CHURCH	4.00	2.77**	2.00	2.33			
DRINKING	1.65	3.50***	1.68	2.11	2	9.06 (1,50)	.005
MOVIES	4.10	3.68	1.33	1.70	7	2.84 (1,45)	.10
RELATIVES	5.10	4.45	1.49	1.87			
DATING	4.29	4.44	1.79	1.53	6	4.69 (1,46)	.05
CHILDREN	4.68	3.23**	1.66	1.90			
ANIMALS	4.65	3.14**	1.60	1.70	3	14.08 (1,49)	.001

Mean Difference: *= $p < .10$, **= $p < .05$, ***= $p < .001$
 All 21 Variables: $F=3.68$, $df=21,31$ ($p < .001$)

Number of Cases Classified Into Groups:

	MALNO	MALSMO	
MALNO	30	1	Lubin's $t = 6.19$ ($p < .001$)
MALSMO	2	20	94% accuracy

TABLE 18

Intercorrelations of SI, Demographic Information
and Other Measures

(all r's significant .05 level or better)

	SD	SAD	F-R	LOC	Nettler	IAR+	IAR-	Johnson	Dean
SD									
SAD	.20								
F-R									
LOC	-.22								
Nettler		.31		.21					
IAR+					-.27				
IAR-						.34			
Johnson				.29	.40	-.31	-.37		
Dean	-.31	.23		.23	.31				
Sex	-.26								
SMO Code					.26			.46	
GPA		-.25	-.27		-.27				
Age						-.26			
Ethnic			.27						
		CLD	DAT	POT	SMO	BKS	BKS	BKS	DRK
		.30	0.23	.44	.27	.30	.33	-.47	.23
SI*		MON	FRD	SMO	SCH		DAT	SMO	
		-.19	-.21	.39	-.26		-.27	.34	
			CLD	DRK	BKS		CLD	JOB	
			-.21	.32	-.26		-.21	.27	
				FTR				DRK	
				-.22				.26	
								CAR	
								.25	

*The abbreviations used here represent the same SI items as listed in previous tables.

SD=Social Desirability
 SAD=Social Avoidance and Distress
 F-R=Frequency-Response
 LOC=Locus of Control
 Nettler=Nettler's Alienation Scale
 IAR=Intellectual Academic Responsibility
 Johnson=Johnson's Smoking Rationalization Scale
 Dean=Dean's Alienation Scale

TABLE 18 (continued)

	Sex	SMO Code	GPA	Age	Ethnic
Sex					
SMO Code					
GPA		-.21			
Age					
Ethnic		.23		.34	
	SPT	SMO	BKS	FRD	DRK
	.37	.68	.40	-.26	.29
	CAR	SCH	SCH		BKS
	.24	-.46	.33		-.27
	EAT	DRK	FRD		FRD
	.23	.46	.30		-.22
	MON	POT	MON		ANM
SI	.22	.39	.27		-.21
	POT	BKS	SMO		
	-.21	-.34	-.26		
	CLD	ANM	SLP		
	-.21	-.35	.24		
	TV	DAT	DRK		
	.20	.28	-.22		
		CHR	POT		
		-.23	-.20		
		REL			
		-.20			

smoking questionnaire responses: sex, smoking code, GPA's, age, and ethnic designation. Correlations greater than $\pm.20$ are shown; all are significant at the .05 level or better.

Out of a total possible 405 correlations, over a fifth were significant beyond the .05 level, in addition to being equal to or greater than $\pm.20$. Looking first at SI items that correlate with the other personality scores, one finds that only two items correlate with Social Desirability, CHILDREN (.30) and MONEY (.19). The Social Avoidance and Distress (SAD) scale correlated significantly and inversely with three items, FRIENDS, DATING, and CHILDREN. Jackson's FR index, originally included in order to check for frequency of random responding, was significantly related with higher scores on SMOKING, DRINKING, and MARIJUANA. The three indices of the internality-externality of reinforcement concept, the LOC and two IAR scores, have few correlations with the SI. Both IAR+ and IAR- did correlate with the item BOOKS, perhaps because the IAR deals more specifically with academic situations than does the LOC scale. Higher scores on Dean's Alienation scale correlated with lower ratings on BOOKS and SCHOOL and with higher ratings on SMOKING. The other Alienation scale, developed by Nettler, correlated positively only with the item DRINKING.

A large number of the SI ratings correlate with the demographic data and smoking information. Endorsement of pro-smoking rationalizations on Johnson's scale is directly

related to higher ratings on SMOKING, JOB, CARS, and DRINKING and negatively correlated with value ratings on BOOKS. The trichotomized smoking code produces even a higher number of correlations with the SI. In addition to BOOKS being negatively related to smoking membership, SCHOOL, ANIMALS, CHURCH, and RELATIVES bear a similar inverse relation. It should also be noted that SMOKING correlated quite highly with the simple smoking code (.68). DRINKING, MARIJUANA, and DATING were also directly related to the smoking code. As had already been demonstrated in Table 15, with the stepwise analysis of the male and female division, different SI items were correlated more with sex than they are with smoking and non-smoking, i.e., SPORTS, CARS, EATING, and MONEY.

Almost a third of the items had significant correlations with GPA. As anticipated, GPA was positively related to SCHOOL and BOOKS and negatively associated with SMOKING, MARIJUANA, and DRINKING. The so-called ethnic scale used here correlated significantly with DRINKING and, negatively, with BOOKS, FRIENDS, and ANIMALS. It should be remembered that the higher "scores" on the ethnic variable reflect membership in the Puerto Rican, Filipino, Portuguese, and Hawaiian categories, all being segments frequently associated with lower socio-economic class membership.

Among the other personality measures (SI excluded) nearly all of the significant correlations involved the two

measures of Alienation and the Smoking Rationalization questionnaire. For example, those agreeing with more of the rationalization also tended to be more external on the LOC, more alienated on Nettler's scale and take less responsibility for both success and failure for their academic behavior, as indicated by the IAR. Avoidance of social situations, as indicated by the SAD, is significantly related to both Alienation measures. Few of the scales, however, showed any significant relationship with the smoking code. Only Nettler's Alienation scale and the Smoking Rationalization correlated positively with the smoking code.

In Table 19 are the results of submitting the personality scales (minus the Smoking Rationalization scores and, of course, the SI) and GPA to the step-wise discriminant analysis for smokers and non-smokers. The only significant F to enter was for the first step, GPA, a perennial discriminator of smoking behavior. The F test of the discriminant function for all nine scores, however, was not significant. In addition, over a third (37%) of the Ss were misclassified by the total set of scores. Although the magnitude of mean differences between the smokers and non-smokers did not reach significance with most of the personality measures, the directions of the mean differences were as predicted in eight out of nine cases. In other words, smokers had lower GPA's, higher alienation scores, a more external locus of control,

TABLE 19

Step-wise Discriminant Analysis of Eight
Personality Measures and GPANon-smokers (NOS) and Smokers (SMO)
(n=36) (n=24)

	Means		Standard Deviations		Step Entered	F Value to Enter (df)	p
	NOS	SMO	NOS	SMO			
GPA	2.72	2.23**	.69	.78	1	6.74 (1,58)	.025
SD	3.81	3.41	2.07	1.69			
SAD	7.11	7.67	4.11	4.10			
F-R	.31	.54	.58	.83			
LOC	9.72	10.63	3.37	2.70			
Nettler	43.53	46.88**	6.61	5.27			
IAR+	7.11	6.88	1.74	1.78			
IAR-	6.83	6.88	1.65	1.87			
Dean	52.22	54.29	7.05	10.04			

Mean Difference: *= $p < .10$, **= $p < .05$, ***= $p < .001$
 All 9 Variables: $F=1.12$, $df=9,50$ (n.s.)

Number of Cases Classified Into Groups:

	NOS	SMO	
NOS	22	14	Lubin's $t = 2.86$ ($p < .005$)
SMO	8	16	63% accuracy

indicated less responsibility for their academic successes, had a lower concern for the social desirability of their actions, greater aversion for social interaction, and exhibited a greater likelihood for making random responses. Only IAR-, responsibility for academic failure, was not in the predicted direction.

The above data were analyzed again with the 21 SI items (SMOKING and MARIJUANA excluded) added to the set of nine variables shown in Table 19. Although the 21 SI items had already been analyzed (Table 13), a direct comparison of all variables in the same analysis was desired. In addition, because of missing data for the other personality measures, a smaller sample was used in Table 19 than was the case for Table 13. This combined test of all scores is reported in Table 20. A total of eight variables had significant F's to enter. All were from the SI; these were, in descending order: SCHOOL, DRINKING, ANIMALS, SPORTS, CARS, FATHER, JOB, and MOVIES. The discriminant function for all 30 variables was significant at the .005 level, and the classification accuracy was 97%. Tables F and G, Appendix, demonstrate much the same utility for the SI variables in discriminating between smokers and non-smokers for the auxiliary high school and college samples. The discriminating items, however, were most similar between the primary and pilot high school samples: DRINKING, BOOKS, and SCHOOL. The college smokers were shown to be most unlike their non-smoking

TABLE 20

Step-wise Discriminant Analysis of Eight Personality Measures
and GPA Combined with the SI Items

(Smoking and Marijuana Omitted)

Non-smokers (NOS) and Smokers (SMO)
(n=36) (n=24)

	Means		Standard Deviations		Step Entered	F Value to Enter (df)		p
	NOS	SMO	NOS	SMO				
GPA	2.75	2.23**	.68	.78				
SD	3.81	3.42	2.09	1.69				
SAD	7.11	7.67	4.12	3.10				
F-R	.31	.54	.58	.83				
LOC	9.72	10.63	3.40	2.70				
Nettler	43.53	46.88**	6.61	5.27				
IAR+	7.11	6.88	1.76	1.78				
IAR-	6.83	6.88	1.67	1.87				
Dean	52.22	54.29	7.15	10.04				
EATING	5.11	4.67	1.43	1.49				
BOOKS	4.57	3.00***	1.44	1.44				
FRIENDS	6.20	5.75	1.08	1.22				
MUSIC	5.29	5.58	1.64	1.25				
SPORTS	5.00	4.21	2.06	1.84	4	4.93 (1,55)	.05	
SCHOOL	5.43	3.38***	1.42	1.41	1	29.97 (1,58)	.001	
JOB	4.49	4.71	2.03	1.92	7	3.43 (1,52)	.10	
FATHER	6.46	5.38**	.98	2.08	6	4.15 (1,53)	.05	
HOBBIES	4.46	4.25	1.72	1.89				
MONEY	5.57	5.67	1.22	1.37				
CARS	4.80	5.54*	1.68	1.14	5	4.56 (1,54)	.05	
MOTHER	6.57	6.13*	.78	1.26				
SLEEPING	5.20	4.67	1.26	1.37				
TV	4.80	4.00*	1.49	1.74				
CHURCH	4.11	2.75*	1.84	2.05				
DRINKING	1.49	3.46**	1.31	2.11	2	9.29 (1,57)	.005	
MOVIES	4.26	4.04	1.40	1.57	8	2.83 (1,51)	.10	
RELATIVES	5.14	4.46	1.44	1.82				
DATING	4.54	5.04	1.82	1.43				
CHILDREN	4.89	3.67**	1.60	1.76				
ANIMALS	5.00	3.33***	1.51	1.55	3	10.05 (1,56)	.005	

Mean Difference: *= $p < .10$, **= $p < .05$, ***= $p < .001$
 All 30 Variables: $F=3.07$, $df=30,28$ ($p < .005$)

Number of Cases Classified Into Groups:			
	NOS	SMO	
NOS	35	1	Lubin's $t = 7.02$ ($p < .001$) 97% accuracy
SMO	1	23	

peers on the SI items CHURCH, FRIENDS, HOBBIES, and SCHOOL. DRINKING and BOOKS had insignificant discriminative value for the college group, as opposed to the utility of these items in the high school samples.

The Utility of the SI Summary Scores

Two different criteria were used to create summary scores for the Value ratings on the SI. The first criterion, already discussed, divided the SI into the a priori "smoking-type" and "non-smoking-type" reinforcers. The second set of summary scores was produced by creating four sums on the basis of the four factors reported in Table 9. Each of the four scores was created by summing those items having loadings of .50 or higher (except in the case of factor IV where ANIMALS, .48, was included so that the number of items defining a score was at least three for each summary score).

Table 21 lists the means and standard deviations for the summary scores across the four groups of female smokers, female non-smokers, male smokers, and male non-smokers. In addition to the six summary scores outlined above, two other scores were analyzed: a total score based on all 23 items, and the original "smoking-type" summary score with MARIJUANA and SMOKING excluded. An analysis of variance was computed for each of these eight scores. Where significant F's were found on any particular summary score, t tests were computed to determine whether hypothesized mean differences were significant. Because specific hypotheses had already been made

TABLE 21

Means (M), Standard Deviations (SD), and F-Tests (F)
of SI Value Summary Scores

Sex by Smoking Behavior

	Female Non-smokers (FEMNO)		Female Smokers (FEMSMO)		Male Non-smokers (MALNO)		Male Smokers (MALSMO)		F
	M	SD	M	SD	M	SD	M	SD	
SMO ₁ *	34.71	6.46	45.63	8.16	38.65	6.38	41.95	8.46	.001
NOS	63.57	8.64	57.63	8.87	64.13	10.09	55.38	9.38	.01
SUM _T	98.29	13.49	103.25	12.84	102.77	14.08	97.33	15.57	n.s.
SMO ₂	32.71	6.46	38.06	7.47	36.65	6.38	36.62	7.04	n.s.
SUM _I	18.62	4.67	17.94	4.52	20.48	3.56	19.57	3.79	n.s.
SUM _{II}	3.14	1.48	11.19	5.12	3.65	1.68	8.71	4.62	.001
SUM _{III}	26.38	4.02	23.06	5.21	26.26	5.22	22.14	6.22	.025
SUM _{IV}	14.67	2.99	11.88	3.14	14.29	3.71	9.33	3.17	.001

t-Tests of Hypothesized Significant Mean Differences

Summary Score	FEMNO-FEMSMO	p	MALNO-MALSMO	p
SMO _I	-10.91	.001	-3.30	n.s.
NOS _I	5.89	.05	8.74	.01
SUM _{II}	- 8.04	.001	-5.06	.001
SUM _{III}	3.32	.05	4.11	.01
SUM _{IV}	2.79	.01	4.95	.001

*SMO₁ = "Smoking-type" summary score
 NOS = "Non-smoking-type" summary score
 SUM_T = "Total" summary score
 SMO₂ = SMO₁ - (Smoking + Marijuana)
 SUM_I = Factor I summary score
 SUM_{II} = Factor II summary score
 SUM_{III} = Factor III summary score
 SUM_{IV} = Factor IV summary score

as to which differences should be significant, and in which direction, the use of the t test in this fashion is seen as legitimate, as opposed to, say, a post hoc test of only those mean differences that are the largest. These hypotheses, as implied by the a priori division of the SI items, predict that both female and male smokers should measure higher than their same-sex, non-smoking peers on the "smoking-type" summary scores, which will also include here the first two summary scores based on loadings of factors I and II. Conversely, female and male non-smokers should score higher on the "non-smoking-type" summary scores, including those based on factors III and IV, than their same-sex, smoking peers. No significant differences would be predicted for the "total" summary score.

The F test for both of the a priori summary scores were significant at the .01 level or better and all mean differences were in the predicted directions. The t's were significant for both sex by smoking and non-smoking mean differences for the "non-smoking-type" summary scores. Only the female means were significantly different for the "smoking-type" scores, however. The F for the "total" score was not significant and the "smoking-type" summary score dropped to the .10 level of significance when both MARIJUANA and SMOKING were removed from the sum. The male smokers and male non-smokers ended up with virtually identical summary scores with these two items removed, although the mean differences for

the female groups were significantly different at the .05 level, having been significant at the .001 level with MARIJUANA and SMOKING left in.

The four scores based on the factor sums had significant F's, except for the scores based on factor I, "Youthful Zest". In addition, the mean differences on this score were in the opposite direction for both males and females from what would be expected from the a priori dichotomy of the SI. In other words, while all four items constituting the summary score were originally categorized as "smoking-type" items, non-smokers scored higher, although not significantly so. The remaining three summary scores, however, had significant F's, all with significant t's in the predicted direction for both males and females. That summary scores based on factor II (sums of MARIJUANA, SMOKING, and DRINKING) significantly differentiate smoking and non-smoking samples, carries little information. Not as obvious, however, were the significant differences in scores based on factor III, the "Other-Centered" factor (sums of items SCHOOL, CHILDREN, and ANIMALS) and on factor IV, the "Kinship Approach" factor (sums of items FATHER, MOTHER, CHILDREN, RELATIVES, and CHURCH).

CHAPTER IV
DISCUSSION AND CONCLUSIONS

That smokers are more inclined to admit drinking and smoking marijuana, or even that they rate school and books low, is quite consistent with earlier research on smoking behavior (e.g., Pumroy, 1967; Matarazzo & Saslow, 1960). But the results showing that summary scores based primarily on "Kinship" items are also significant in identifying smokers lend strong support for first major hypothesis of this study, i.e., there indeed appear to be both important quantitative and qualitative differences in the system of reinforcers operating for smokers and non-smokers and the SI is capable of indexing some of these differences in at least three different samples of young people.

The discriminant analyses consistently showed the relative importance of several of the SI items in classifying among various groupings of the Ss. Several items proved to be of importance in classifying the sexes, both in the primary high school data and with the college auxiliary sample. It is difficult to claim equivalence of results with the auxiliary data, however. For instance, although the first sample of high school smokers valued some items in the same direction as did the primary sample, the direction of some of the discriminating items common to both samples was opposite, e.g., DATING, JOB, and RELATIVES. The smaller n involved in the

first high school sample, the 5-point scale range, and different format of the SI used are seen here as contributing to such results. Of particular importance is the increased homogeneity across the entire scale for smokers in the first sample. This can be seen clearly in Table F, where all 20 items (excluding SMOKING and MARIJUANA) rated by smokers fell within the range 3.00 to 3.86. The comparable range with the primary high school data, using the revised 7-point scale SI, was 2.82 to 6.13.

The other major hypothesis involved in the present study dealt with the comparison of the utility of all the measures in the discrimination of smokers and non-smokers. It had been hypothesized that to the extent the included scales reflected something of the postulated different learning contingencies and established hierarchies of reinforcers for smokers and non-smokers, the better each scale should be able to discriminate the two groups. It had thus been hypothesized that smokers should have scored higher on the measures of general alienation, externality of control in general and in academic situations, and avoidance and stress evoked by social situations. While the Social Desirability and Frequency Response had been included for a validity check, rather than as potential discriminators of the smoking behavior of the Ss, it had also been speculated that smokers would be less concerned with creating a social image and more likely to respond in a more haphazard fashion on the FR scale. In addition,

the SI was predicted to have at least equal efficacy, or better, for discriminating between smokers and non-smokers when compared with the other measures. Although smokers did score generally in the predicted directions, few of the mean differences were significant and the discriminant function involving all of the measures, excluding SI, failed to reach significance.

The correlation of the SI with the other measures provides some information about the construct validity of the SI. For example, Social Desirability correlated significantly with only two of the SI items, CHILDREN and MONEY. This suggests that the SI is quite independent of the SD concept as a major contributor to the variance in the SI ratings. The positive correlation of SMOKING, MARIJUANA, and DRINKING with Jackson's index of "pseudo-responding", the FR scale, deserves some comment. Although the mean scores for this scale are small, both smokers and non-smokers averaged less than a score of 1, Jackson's interpretation would be that smokers answer the scales more impetuously and randomly than do non-smokers. Another explanation seems reasonable here, however. Although six items were included from Jackson's scale, two items accounted for over half of the non-zero FR scores (52%): "If I were exploring a strange place at night, I would want to carry a flashlight" and "I would have a hard time keeping my mind a complete blank". While Jackson interprets a negative response as an indication of "pseudo-responding" for these

two items, such replies, especially to the last question, also reflects a "hip" reply that has current reinforcing social value for certain populations, e.g., the current interest of many youthful drug users in various forms of Oriental meditation (Fort, 1969). Thus, the higher FR scores for smokers, marijuana users, and drinkers suggests, especially considering the items responsible for many of the scores, rejection of conventional reinforcers as much as it indicates either accidental or deliberate pseudo-responding.

The negative correlation of the items FRIENDS, DATING, and CHILDREN with the SAD scale provides some construct validation for all four scores. Significantly, both the IAR scores correlated positively with BOOKS, as might be expected for an inventory of "academic responsibility". The correlation of the two measures of "alienation" with the SI items indicate that pro-smoking, pro-drinking and anti-school attitudes are associated with elevated feelings of "alienation". The larger number of SI items that correlated with estimated grade point averages is seen as significant. Higher grades were logically associated positively with academic SI items and associated negatively with the "stimulant" items. A similar correlational pattern was found with the ethnic variable. The Filipino-Hawaiian-Portuguese groups tended to assign higher values to "sensual" items and lower values for the "academic" and "socialness". While the present data allow only speculation here, the frequently correlates of ethnic

membership perhaps could be better understood by assessing something of the relative importance of various reinforcers on specified behavioral contingencies through the use of the SI or a similar inventory.

Correlational data on the SI items themselves indicate that there is acceptable stability and logical internal consistency among the ratings made by the high school and college samples. The Strength, Value, and Frequency ratings inter-correlated quite highly within each item. Allowing for the influence of deprivation and satiation and barring coercion, such high correlations would be expected. In general, those items that frequently influence responses by the individual should also be evaluated positively and have some degree of influence on one's daily behavior. But as the variety of across-rating dimensions correlations indicate, especially for the Value-Frequency dyad, Frequency and Strength ratings indicate something of the degree of influence but, in themselves, do not show whether the item being rated functions as a positive or negative reinforcement, or whether it evokes approach or avoidance behavior.

For example, most high school students would logically be frequently influenced by their parents, but this would not necessarily result in the students also highly rating their parents on the Value dimension. For other items, however, the Strength and Frequency ratings of items should be less determined by circumstances of birth and coercive rules (e.g.,

compulsory school attendance or age limits on obtaining driver's licenses) and more by the experienced contingencies associated with the items. Thus, to say that one is frequently influenced by participating in sports or a hobby should lead to concomitantly higher Value ratings on the items SPORTS and HOBBIES, as was found.

The higher reliability of the Value ratings on the SI corresponds to the findings originally reported by Osgood, Suci, and Tannenbaum (1957). Evaluative ratings on the Semantic Differential are more reliable than Potency or Activity scores. Perhaps such stability is because such evaluative ratings are more "meaningful" for Ss to make, especially when one views the SD more as an "Experiential Differential" as Carroll (1959) suggested. Perhaps more discrimination training occurs in our society for making evaluative judgements than for judgements of either the strength or frequency of influence that certain objects, persons, or events have on our behavior.

The correlations among the individual SI items and the factor analyses also demonstrate consistency in the manner that items covary. For example, those Ss rating SMOKING as having a high value for them also tended to value other stimulants and devalue academic affairs. The kinship items intercorrelated highest with one another, as did the "entertainment" items and items reflecting physical viability. The four factors extracted from the Value correlation matrix

support the construct validity of the a priori distinction that had been made regarding the postulated existence of at least two general classes of reinforcers that should be of heuristic value in discriminating smokers from non-smokers. Only one of the resulting factor summary scores, "Youthful Zest" proved not to have significant utility in the discrimination of smokers and non-smokers. The other three summary scores based on the factor loadings were shown to be useful, in the predicted directions, for such a discriminating task.

The evidence from the results of this study supports the views that both qualitative and quantitative differences exist in the reinforcer hierarchies of smokers and non-smokers and that there is heuristic value in using the SI to measure these differences. In the following section we will turn to speculations regarding the theoretical significance and implications of these results.

While it has been argued that there is evidence supporting the two major hypotheses of this study, several points should be made explicit with regard to the nature of this "evidence". As with most non-experimental personality research, the data in this descriptive study demonstrate R-R relationships and hence offer no clear unequivocal evidence as to antecedent conditions that would explain the relationships found between the SI and the other measures. In other words, while the SI ratings have been shown to be of some use in predicting and classifying smokers and non-smokers, the SI

scores do not explain completely why smoking or non-smoking occurs. To offer an explanation of both the SI ratings and smoking behavior it would be necessary to demonstrate what antecedent stimulus conditions, if any, govern both the manner in which the SI was filled out as well as the initiation and maintenance of cigarette smoking. It is argued here that although the present research provides no direct evidence about possible antecedent stimulus conditions, the information provided by the SI makes it easier to make speculations about important learning parameters than, say, when constructs such as "alienation", "anxiety", "intelligence", or "suggestibility" are posited as "explanatory" factors in understanding smoking behavior.

There are various approaches one could take in discussing the implications of the SI, such as attempting to relate it to other existing personality constructs. A somewhat different approach will be taken here, however. Speculations about the SI will focus instead on a discussion of what is seen as happening when an individual makes his SI ratings, and, by implication, any other paper-and-pencil personality inventory. Primary for the development of the SI was the basic assumption that the subject's mark on the 7-point scale was guided by the prior experiences he had had with the actual referents represented by the verbal items. The variability in score was thus postulated to reflect concomitant variability in the reinforcement value of the items constituting the SI. Empirical

research by Platonov (1959), Razran (1961), and Finley and Staats (1967) provide the rationale for using such a mediational procedure as the SI. These researchers have shown the predictable influences that words exert on behavior as well as the close relationship that evaluative ratings have with conditioned emotional responses. Other researchers have shown that it is possible for independent observers to measure individual differences in the reinforcement values of various objects, persons, and events and that such information has utility in predicting and modifying behavior for psychiatric patients (Ayllon & Azrin, 1968; Kanfer & Saslow, 1965) and young pre-delinquents (Thorne, Tharp, & Wetzel, 1967). With the SI it has now been demonstrated that it is also possible to have "normal" Ss provide similar information systematically via a self-report inventory.

A recent theoretical paper by Staats (1969) is pertinent to the preceding discussion about the advisability of using verbal ratings in the analysis of behavior. Staats has focused on the important function that the classical conditioning paradigm has in understanding how emotional responses are elicited by verbal stimuli, which, in turn, allows for those words then to serve both as reinforcing and discriminative stimuli in an operant conditioning situation. Thus, a word, such as FOOD, through contiguous association with actual food, comes to elicit similar physiological reactions as does the unconditioned stimulus. The word FOOD thus is able to

function so as to increase the probability of occurrence of a response that precedes it in an operant situation, as well as control approach and avoidance behavior. It is thus possible to talk about the various emotional responses, reinforcing properties and discriminative control of various stimuli. Staats labels these three functions of a previously neutral stimulus, the attitudinal (the conditioned emotional component), reinforcing and discriminative functions (A-R-D). He suggests that there should not only be predictive and explanatory utility in being able to index the pertinent stimuli that comprise the set of effective stimuli in an individual's A-R-D system, but also that within a single individual, knowledge of the relative reinforcing intensity of these stimuli at any point in time should be important for any attempted analysis of the person's behavior. In addition, it should be important to analyze the individual's A-R-D system within the context of the larger societal A-R-D system.

In the language of the A-R-D hypothesis then, a word elicits an attitudinal response, which makes that word "both a conditioned stimulus as well as a reinforcing stimulus . . . (as well as) a discriminative stimulus controlling either a class of striving-for or a class of striving-away from behaviors . . . (p. 59)." Thus, Staats argues, the rating of a word would be the measurement of the discriminant function (D) of that item. The three A-R-D functions can be assessed from observations only of the discriminative stimulus value.

The higher stability and subjectively greater "ease" in making the Value ratings on the SI could be interpreted as an indication that Value ratings connote better the sense of "striving-for" or "striving-away" implicit in the discriminative function of items than do the ratings of Strength or Frequency. Staats has postulated a hierarchical organization of the relative influence of reinforcer on behavior. For example, if deprivation occurs for reinforcer A, the strongest reinforcer for the individual let's say, then reinforcer B, the second strongest, would become relatively predominant in shaping and maintaining future behavior. It should be possible to identify classes of reinforcers that are functionally related, as well as hierarchical in nature, e.g., FOOD reinforcers or SEX reinforcers, within individual A-R-D systems.

It is postulated that the SI ratings serve as a rough index of the individual's A-R-D system and that the mean ratings on the items reflect something of the nature of the hypothesized differences in the hierarchy of reinforcer systems for smokers and non-smokers. While it would be premature to speak of "classes of reinforcers" being clearly definable from the SI data, the results do indicate that such potentially useful data might be found in future study. The SI results suggest that such classes of reinforcers tentatively identified as "strong CNS stimulus", "relatives", and "academic" are important dimensions in which one might find individual differences between smokers and non-smokers.

The postulated hierarchical nature of an individual's A-R-D system and how that system compares and integrates with crucial A-R-D components operating in the person's day to day environment may be important considerations that serve to limit the generalizations possible for the present research results. For instance, the content of the SI would have to be changed by deleting and adding certain variables in order to maintain some degree of "face" validity and content validity for use with older, "non-school" populations. There should be, in other words, important differences in the sources of satisfactions available to students and older adult groups. As has been pointed out by social commentators (e.g., Goodman, 1960), a middle-class, white American youth is kept in a state of protracted or extended adolescence through the use of formal and informal sanctions, e.g., compulsory school attendance laws, child labor laws, and curfews. Many forms of reinforcement available are thus sanctioned or denied on the basis of age. The use of alcohol, cigarettes, adult titles of address, sexual activity, voting, and most vocational behaviors are either denied or restricted as reinforcers for adolescents.

Much of the time and activity that occurs during the later adolescent years involves the exhibition of "academic" skills, under primarily "grade" reinforcements. Several questions seem appropriate here. For instance, what are the consequences when it becomes difficult or impossible

for an individual to exhibit behaviors that will make it possible for him to experience certain anticipated or desired events? Do other reinforcers become predominant as alternative sources of satisfaction? In some recent articles on the concept of self-control, Goldiamond (1965, 1968) has discussed "systematic sequences" of behavior, where the acquisition of one behavior is dependent on the acquisition of prior behaviors. "Behavioral curricula" thus are seen as underlying all behavior. For example, if the product of education is not reinforcing, the behavior which leads to it may not be maintained and thus other reinforcers should come to the fore in maintaining alternative "behavioral curricula". Of course, as Mowrer (1950) and Maier (1949) pointed out years ago, the alternatives can be quite "paradoxical" in nature, seemingly self-destructive and self-perpetuating. But as recent research has shown, if undergoing punishment is the only alternative available in order to obtain reinforcement, the research subject will endure punishment readily (Azrin, 1965; Holz & Azrin, 1961). Without knowledge of the learning contingencies that were used to establish such behavior, the actions would indeed appear "paradoxical", as well as "masochistic", "irrational", perhaps even "psychopathic".

Archival data and systematic observations of naturally occurring behaviors suggest some of the consequences that may result when rather pervasive discrepancies exist between an

individual's and larger society's A-R-D systems. For example, various indices indicate that following the 1968 exertion of control in Czechoslovakia by the Soviet Union, the consumption of alcohol, tobacco, and drugs increased by 20% (Shearer, 1969). In this country, there have been reports of "startling" increases in the incidence of drug use, suicide, and acts of "senseless violence" among our youth (Fort, 1969; Mead, 1970). Such behavior has been attributed to a "lack of commitment" (Mead, 1970) and even to the emergence of the "daemonic" nature of man, which appears during times of transition (May, 1969). Fort's (1969) analysis of youthful drug use comes closer to the interpretation seen compatible with the present research. He sees such drug use as "a barometer and a commentary on the society, reflecting the failure of the family, the schools, and the 'leaders'." Assuming that low Value ratings on MOTHER, FATHER, SCHOOL, BOOKS, and RELATIVE indicate some degree of "failure", the SI data tend to support Fort's basic contention here.

Some have even argued that "compulsory education" causes drug usage among the young (Berger, 1969). While such causal inferences beg many questions as to how "compulsory education" can function in such a fashion as to produce and maintain drug taking behaviors, such an "explanation" is seen as having equal, if not greater merit than such constructs as "intelligence", "anxiety", or "alienation". At least the word "compulsory" indicates that aversive and

negative reinforcement perhaps characterize much of the contingencies inherent in our educational system. Skinner (1968) offers some discussion into the possible ways in which contingencies in our schools may be related to some of the current "paradoxical" behavior of our youth. He argues that because our school systems are operated with a poor understanding of how learning occurs, educational experiences are largely negative for many students. Inadequate and inappropriate reinforcements are the rule and the widespread use of aversive controls frequently lead to poor mastery of those basic behaviors that, in the sense of Goldiamond's (1965) "systematic sequences", are requisite for later academic and vocational behaviors. Those young students having A-R-D systems developed at home which allow for the greatest generalizability to the A-R-D system operating in the schools (e.g., conditioned verbal reinforcers and training for high rate of responding under intermittent reinforcement) should have a greater likelihood of being integrated into the A-R-D systems operating in the adult world.

The current research suggests a type of "frustration-seek other sources of satisfaction" hypothesis. Those students who find less reinforcement from home and school seek out other sources of satisfactions--friends, dating, cars, convenient stimulants. Several very recent research projects on youthful smoking support this hypothesis.

McKennell and Bynner (1969), using a Semantic Differential type scale involving 19 bi-polar items and four concepts (the self, ideal self, smoker, and non-smoker), tested over 5,000 British school boys, age 11 to 15. They labeled three factor scores derived from their scale. "Educational Success", "Toughness", and "Precocity". On only one of these three attributes did smokers clearly admit that non-smokers outdid them, "Educational Success". The authors interpret this finding to mean that smokers "see themselves as being failures in comparison with non-smokers".

Smokers rate themselves, however, higher on both "Precocity" and "Toughness" and the non-smokers tend to agree with the smokers' self-perceptions. "Precocity", defined by two bi-polar items, "interests in girls" and "attempts to attract girls", appears to be of little interest for the non-smokers. McKennell and Bynner discuss the possibility that their results indicate that smokers derive "ascendency" and "achievement of status by other means" than by academic behavior, presumably by their "Toughness" and "precocity". The authors do not speculate as to the manner in which precocious and tough behavior might be acquired.

A closer inspection of the 19 items offers some interesting information when compared to some of the preceding discussion. As in the case of many personality scales (Mischel, 1968), the 19 items consist of a mixture of

statements referring to actual behavior ("does not swear"), inferred emotional states ("likes to be alone"), and non-specific evaluative judgments ("often successful"). Nonetheless, such items as "neat and clean", "often successful", "plans and thinks ahead", "good at sports", "acts own age", and "good at school work" lead the highest on the "educational success" factor. What these items all have in common besides the postulated "Educational Success" is a moot point, but it is argued that they also indicate something about the type of A-R-D system that would provide a higher likelihood of experiencing a wider variety of reinforcers in other A-R-D systems. "Toughness" was defined by the items "good fighter" and "tough"; "Precocity" by the aforementioned items dealing with girls. All of these items strongly suggest the type of A-R-D system that would compete with most of the reinforcers and contingencies operating in a school system, or at least would result in a diversion of effort and time from ascendancy in an academic situation.

Research by Digman and Young (1969) provides further support for the foregoing analysis. Using teacher ratings of 7th-through 9th graders, two factors labeled "Compliance" and "Industriousness" provided the best predictability of smoking behavior. A smoking inventory correlated $-.37$ and $-.33$, respectively with these two factors (.001 level of significance). These teacher ratings of their students involved assigning each one a number indicating how much

he or she matched several characteristics. For example, "Compliance" was defined by the following characteristics, "neat in appearance", "careful of other's property", "careful of personal belongings", and "mannerly". "Industriousness" was defined by the ratings on "planfulness", "persevering", "responsible" and "non-fickle". Smith (1969) found similar results when he had high and junior high school student smokers and non-smokers rate one another. For example, he reported that smokers were seen by their peers as being less "Agreeable" (e.g., rated as being less considerate, tender, and more likely to hide mistakes and seek attention), as having less "Strength of Character" (rated less conscientious, responsible, obedient, orderly and more quitting and crude) and as being more "Extroverted" (rated more talkative and unconventional and less shy and pensive) than non-smokers. All of these descriptive labels of smokers are seen as being logical, concomitant terms associated with behaviors produced by less effectual and compatible A-R-D systems of some smokers.

More refined classifications of smoking behavior have been proposed than the simple binary used in the present research. One possibly relevant classification offered by Tomkins (1968) provides for a smokers' typology that views smoking within the context of what other reinforcers are or are not operating for the smoker. For example, Tomkins has suggested that for the "habitual" smoker, smoking no longer is particularly reinforcing, at least not as it once might

have been. With the "psychologically addicted" smoker, on the other hand, smoking serves as an extremely potent discriminative stimulus, as well as a conditioned reinforcer. For such an individual, smoking relieves both negative affect and evokes positive affect in a cycle which Tomkins outlines as follows, ". . . first, the smoker is always aware of the fact that he is not smoking whenever that occurs . . . Second, such awareness of not smoking invariably evokes negative affect . . . Third, he thinks that only a cigarette will reduce suffering . . . Fourth, only smoking will evoke positive affects . . . Fifth, it is expected that it happens that his negative affect will increase in intensity until it is intolerable, so long as he cannot smoke . . . Sixth, his expectation that smoking will both reduce his suffering and evoke positive affect are invariably confirmed (In Horn, 1967, p. 43)."

Tomkins suggests that for other smokers, the cigarette does not have as potent discriminative control over behavior as it does for the "addictive" smoker. He classifies other smokers into either groups that smoke to reduce negative affect or groups that smoke primarily to heighten positive affect. The negative affect groups are divided into two types: those "partial sedative" smokers who use their habit to assist in reducing their feelings of distress, fear, shame, or disgust enough to be able to confront the source of problems and cope with them, and those "complete

sedative" smokers who smoke almost exclusively to reduce such feelings, often with little or no consequent decrease in the source of the negative affect. For the positive affect smokers, Tomkins describes the "relaxation" smoker and the "stimulation" smoker. The former uses cigarettes primarily as an additional source of positive reinforcement, i.e., they smoke frequently when they are already experiencing other positive affects. The latter type of smoker is said to gain his reinforcement out of the increased stimulation provided by smoking. This stimulation may be primarily from the effects of nicotine and other substances in the smoke on the central nervous system, while for others, the source of stimulation may be from the excitement surrounding the act itself. For example, for a youth trying out cigarettes, the excitement obtained from engaging in a semi-forbidden practice may serve as a major source of the reinforcements involved in smoking.

Although Tomkins does not make such an interpretation, it is suggested that another dimension upon which one could make such distinctions between different "types" of smokers would be the position that smoking plays in the individual's A-R-D system. For example, by definition the behavior of the "psychologically addicted" smoker is under more extensive and pervasive discrimination control of cigarettes than would be the case for the "relaxation" smoker, say. Many of the different attempts to modify smoking habits may

well be differentially influential, and in many cases quite irrelevant, depending on the "types" of smokers involved. It would appear likely that certain "types", such as the "psychologically addicted" and "complete sedative", who are postulated to be deriving an inordinate amount of their day to day reinforcements from cigarettes, would respond poorly to some of the short-term modification techniques used.

Only recently have researchers begun to test the utility of Tomkins' model. Some preliminary data based on a smoking inventory constructed around Tomkins' typology suggests that the "habitual" and "addictive" smokers' scores have significant discriminative ability in classifying smoking modification outcomes (Horn, 1969). A similar inventory had been used with the college auxiliary sample; the complexity of the model indicated that such an inventory was not entirely appropriate for the more inexperienced, shorter-term high school samples. With the 38 college smokers it was found that the SI items were useful in the discrimination of "high" versus "low" scorers on the "psychological addictive" category of smokers. Table H, Appendix, shows that the items DRINKING, DATING, and MARIJUANA were all significant discriminators of this dichotomy of smokers. Those smokers having "high" scores gave higher value ratings to DRINKING and MARIJUANA and lower DATING ratings, than did the "low" scorers. Also, a brief research note by Mausner (1967) indirectly indicates the potential

for using a more refined definition of smoking behavior. Using information supplied by junior high school students, smokers were classified into those who smoked primarily as a form of "tension relief", those who smoked for "social reasons", and those who smoked for "enjoyment". He found that all three groups of smokers had lower GPA's than did the non-smokers. However, Mausner also demonstrated significant differences among the three smoker categories, with the "tension release" smokers having grades quite similar to the non-smokers and "social smokers" having the poorest grades (significantly different even from the "tension release" smokers).

Although the percentages of individuals who stop smoking as a result of participation in any of the typical short-term treatment programs are discouragingly small (Keutzer, Lichenstein & Mees, 1968; Bernstein, 1969), there appears to be some variability in some of the results that are in keeping with the present analysis. In the following section, several smoking modification studies pertinent to the discussion will be evaluated.

Most of the earlier attempts to modify smoking behavior, starting in the 1950's, emphasized a "fear" approach (e.g., Janis & Feshbach, 1953; Janis & Terwilliger, 1962). In general, these campaigns were of little help in getting people to stop smoking for very long (Smoking & Health Newsletter, 1968). Some recent research by Leventhal and

associates suggests that perhaps some crucial variables have been overlooked in the prior studies. Leventhal, Watts, and Pagano (1967) used a "high" versus "low" fear arousing "communication" (in the "high" condition, smokers saw a rather gory color film of a lung cancer operation) to try to modify the smoking habit. The typical results were found: when verbal attitudes were measured immediately after seeing the film, there was a significant decrease in anti-smoking sentiment; but later observations of actual behavior showed no change in smoking habits. However, when Leventhal provided other subjects with a pamphlet containing rather detailed suggestions on how one might go about stopping, the "high" fear condition subjects had a substantial and significant decrease in the frequency of smoking over a three-month period. The authors offer several explanations of these results, including some rather awkward hypothesizing that the non-instructed Ss had "forgotten" their resolutions to themselves and that ". . . the instructed ego does not need to invent evasive maneuvers to overcome strong temptations . . . (p. 321)"

It is felt that a more parsimonious explanation could be offered to deal with the above results. Leventhal's research suggests that when novel, unpleasant stimuli, such as those presented in the film, are seen by smokers, some emotional counter-conditioning occurs to the extent that verbally they indicate a desire to change their behavior in

the future. But unless potentially instrumental behaviors are taught to the smokers in such a fashion that self-employed treatment can be initiated and persistently applied after the film is seen, "fear arousal", by itself, is rather limited in changing smoking behavior. In fact, it could be argued that for some smokers, especially Tomkins' "sedative" smokers, such fear arousing stimuli could lead to increased smoking in an attempt to deal with the negative affect. Although Leventhal did not emphasize the importance of the pamphlet provided the smokers, some of the suggestions contained in it are seen as being significant. It was emphasized that the smoker deliberately consider and restructure for himself many of the important contingencies associated with the smoking habit and that he do such specific actions as change brand of cigarettes and deliberately carry the wrong change for use in cigarette vending machines.

Perhaps it would be instructive to consider here an analogue to the attempts to modify smoking behavior through the use of "fear". Suppose a group of non-English speaking immigrants, representing varied cultures and possessing differences in skills, are shown a non-verbal, but dramatic movie. The film depicts the misery of poverty, disease, crime, and the general depressing events that are concomitant with not being able to speak the language of their foster country. From a behavioral viewpoint, one would not make the naive assumption that such a one-trial aversive

event would have a greater effect, when compared with a control group of immigrants that view no such film, on the dependent variable, which in this case might be the amount of English learned when retested three months after viewing the film. English, or any other language, is just not acquired solely on the basis of fear arousal. Ignoring the A-R-D system brought by each immigrant into such a "fear" situation, and especially ignoring how the individual's system compares and meshes with the A-R-D variables functioning in the immigrant's daily environment, would probably make it impossible ever to be able to explain the variance in English speaking ability found after three months.

It is felt that somewhat the same arguments are applicable in any discussion of current smoking modification programs. Many of the subject-environment events that are viewed as being crucial in the context of this paper are rarely taken into consideration. Even with the modification programs that have used learning models, it is felt that there has been a tendency to underestimate both the breadth and extent of conditioning that may be necessary for many smokers to undergo in order successfully to stop smoking. Most of the behaviorally oriented cessation programs have focussed solely on aversive conditioning, e.g., electric shocks, blasts of hot air, locked cigarette cases, breath-holding, desensitization through suggestions

of nausea, etc. (Azrin & Powell, 1968; Franks, Fried & Ashern, 1966; Keutzer, et al., 1967). The successfulness of such techniques have been shown to be not significantly better than more traditional approaches (Bernstein, 1969). While such aversive techniques might be effective with certain smokers, e.g., Tomkins' "relaxation" smokers, these procedures are seen as not being behaviorally appropriate for most smokers.

Some preliminary evidence reported by Tooley and Pratt (1967) suggests that there are possible advantages in using a combination of behavioral techniques representing other sources of reinforcement than mentioned above. "Covert sentization" was initially used for the first two sessions with the two Ss used in the research, a married couple who were smoking over four packs of cigarettes total each day. This aversive procedure (which has the smoker imagine smoking and becoming nauseated) was quickly replaced by two procedures, however, that emphasized the Ss becoming "participant-observers" of their behavior. In addition to the "coverant control" technique, based on Premack's (1959) differential probability hypothesis and already discussed in conjunction with Keutzer's (1968) article, Tooley and Pratt had the couple practice what the authors label "contractual management" with one another. Here, contracts are defined as ". . . structured social arrangements involving the reciprocal promise of reinforcement for the successful

execution of the contractual contingencies . . . (p. 212)."

A graduated sequence of non-smoking contracts was arranged, by the couple, in which social approval from their family, friends, and the experimenters served as reinforcement.

Both smokers dropped to zero cigarettes per day and stayed that way until publication date of the article. A month's time was taken to accomplish this rate of behavior, using the combination of procedures.

Obviously, the reinforcer systems reanalysis of the preceding studies is post hoc and what utility the SI might have for predicting and controlling smoking behavior changes awaits future research. Other areas where the SI might have heuristic value are in helping to discriminate among other types of "paradoxical" behaviors, e.g., users and non-users of such substances as paint and gasoline for "sniffing", and for correcting certain conditions such as obesity. It might also be useful to obtain independent and direct observations of behavior implied by the SI items in order to check the original premise that individuals can serve as relatively accurate judges of their own behavior. In addition, such information might lead to the development of more objective cues for the graphic scale that appears on the present SI. For example, in lieu of the rather subjective Frequency rating dimension cues used, actual frequency counts could perhaps be measured, e.g., hours spent per week watching TV, attending church activities, working with animals, etc.

It is also possible that training in behavioral analysis would serve to improve the accuracy of the SI ratings. The fact remains, however, that there is demonstrated utility in the ratings made by even a relatively unselected population of adolescence.

As Mischel (1968) has so aptly pointed out, the "cost" factor for tests and scales is a major criterion in judging the utility of any assessment device. The time needed to prepare the device, the preparations needed by those taking it, the administration, scoring, interpretation, and communication of results to others are all crucial when comparing different assessment techniques. As with the SI, simple self-ratings have often been shown to be not only equal, or better, predictors of criterion behavior when compared with more complicated and abstract scales, but also are much less "costly". It is thus possible that while many refinements would be desirable in the SI, the "cost" involved might override the increase in predictiveness provided by such refinements.

A final area in which the SI is seen as having some possible application is in using the items to predict socio-gram outcomes. If, as Stalling (1970) has argued, conditioned evaluative meaning serves as an important basis for predicting interpersonal attraction, the demonstrated differences in reinforcer systems for smokers and non-smokers could provide a theoretical explanation for the

observed tendency of these two groups to have friends with similar smoking behavior (Levitt & Edwards, 1970). Having rather potent reinforcers in common with others should increase and maintain the likelihood of interpersonal approach behavior.

The findings of the present study support the existence of both qualitative and quantitative differences in the hierarchy of reinforcers operating in the lives of young smokers and non-smokers, as measured by the SI. The ease of administration and scoring of the SI, combined with its greater efficacy in discriminating smokers from non-smokers when compared with several existing scale, suggest that such relative single self-rating inventories based on a behavioral model have important heuristic possibilities as alternative personality assessment techniques.

APPENDIX

TABLE A
 Intercorrelations of the Three Rating Dimensions of SI*
 College Auxiliary Sample

	Strength- Value	Value- Frequency	Frequency- Strength
EATING	.58	.32	.60
BOOKS	.69	.65	.74
FRIENDS	.66	.64	.74
MUSIC	.77	.73	.85
SPORTS	.88	.80	.82
SCHOOL	.77	.81	.76
JOB	.83	.77	.77
FATHER	.84	.63	.73
HOBBIES	.87	.79	.84
MONEY	.85	.71	.69
SMOKING	.67	.75	.92
CARS	.86	.71	.73
MOTHER	.85	.69	.76
SLEEPING	.83	.68	.67
TV	.79	.73	.81
CHURCH	.85	.85	.79
SIBLINGS	.74	.64	.76
DRINKING	.70	.81	.73
MOVIES	.81	.65	.72
RELATIVES	.87	.78	.88
MARIJUANA	.90	.81	.90
DATING	.86	.71	.75

*All r's are significant at the .001 level (n=115).

TABLE B
 Factor Matrix for the SI Value Ratings
 High School Auxiliary Sample
 (Loadings Within $\pm .20$ Omitted)

	I	II	III	IV	V	VI
EATING					.62	
BOOKS	.53		.38			
FRIENDS	.67					
MUSIC						-.53
SPORTS			.42		.44	
SCHOOL	.39		.37	.46		.31
JOB	.39				.30	.53
FATHER	.43					.63
HOBBIES				.67		
MONEY				.63	.45	
SMOKING	-.78					
CARS				.39		
MOTHER	.35	.40				.60
SLEEPING		.55			.47	
TV			.56	-.38		
CHURCH			.69	.31		
SIBLINGS		.68				
DRINKING	-.80					
MOVIES		.30	.54			
RELATIVES		.51	.56			
MARIJUANA	-.71			-.31		
DATING	.66					

TABLE C
 Factor Matrix for the SI Value Ratings
 College Auxiliary Sample
 (Loadings Within $\pm.20$ Omitted)

	I	II	III	IV
EATING	.38			.39
BOOKS		-.46		
FRIENDS	.25			.44
MUSIC		-.30		.45
SPORTS				.39
SCHOOL	.36			.37
JOB				.44
FATHER	.64		.24	
HOBBIES		-.29	.31	.27
MONEY		.61		.27
SMOKING	-.27		.24	
CARS		.56	.33	
MOTHER	.66	.21		.52
SLEEPING			.45	
TV				
CHURCH	.29	.25		.26
SIBLINGS	.58			
DRINKING	-.26		.23	
MOVIES			.68	
RELATIVES	.30		.59	
MARIJUANA		-.47		
DATING		.23		.58

TABLE D

Step-wise Discriminant Analysis of SI Value Ratings

Auxiliary College Sample

Males (MAL) and Females (FEM)
(n=22) (n=68)

	Means		Standard Deviations		Step Entered	F Value to Enter (df)	p
	MAL	FEM	MAL	FEM			
EATING	3.68	3.66	.99	.97			
BOOKS	3.91	3.78	1.06	.99			
FRIENDS	4.23	4.47	.92	.68			
MUSIC	3.59	3.91	1.10	.88			
SPORTS	3.73	3.13**	1.12	1.04	1	5.27 (1,88)	.025
SCHOOL	4.27	4.00	1.08	.85			
JOB	3.68	3.63	.99	1.02			
FATHER	4.23	3.94	1.02	1.17			
HOBBIES	3.55	3.22	1.26	1.05			
MONEY	3.86	3.76	1.21	1.05			
CARS	3.64	3.04**	.79	1.16	2	4.75 (1,87)	.05
MOTHER	4.18	4.18	1.26	.98			
SLEEPING	3.95	3.96	1.09	.85			
TV	2.64	2.44	.90	1.11			
CHURCH	2.64	3.18	1.43	1.41	3	3.35 (1,86)	.10
SIBLINGS	3.86	4.03	1.04	1.04	8	3.14 (1,81)	.10
DRINKING	1.23	1.65	1.03	.96			
MOVIES	3.18	2.82*	.66	.93			
RELATIVES	3.09	2.82	.97	1.18			
DATING	4.00	4.01	1.15	.91			

Mean Difference: *=p < .10, **=p < .05, ***=p < .001
All 20 Variables: F=1.38, df=20,69 (n.s.)

Number of Cases Classified Into Groups:

	MAL	FEM	
MAL	18	4	Lubin's t = r.76 (p < .001)
FEM	14	54	80% accuracy

TABLE F

Step-wise Discriminant Analysis of SI Value Ratings
and Other Measures

(Smoking and Marijuana Omitted)

Auxiliary High School Sample

Non-smokers (NOS) and Smokers (SMO)
(n=21) (n=21)

	Means		Standard Deviations		Step Entered	F Value to Enter (df)	p
	NOS	SMO	NOS	SMO			
EATING	3.33	3.62	.91	1.02			
BOOKS	3.90	3.00**	1.04	1.22	5	3.71 (1,36)	.10
FRIENDS	4.43	3.57**	.87	1.36	7	3.16 (1,34)	.10
MUSIC	3.95	3.52	.92	1.17	8	3.78 (1,33)	.10
SPORTS	3.29	3.33	1.10	.91			
SCHOOL	4.00	3.10**	1.10	1.04			
JOB	4.29	3.24**	1.01	1.09	3	4.57 (1,38)	.05
FATHER	4.10	3.57	1.00	1.21			
HOBBIES	3.57	3.05	1.12	1.32	14	5.12 (1,27)	.05
MONEY	3.81	3.67	1.21	1.32			
CARS	3.10	3.33	.94	1.16			
MOTHER	4.33	2.86*	.73	1.01			
SLEEPING	3.67	3.86	1.11	1.11			
TV	3.43	3.38	.81	1.16			
CHURCH	3.29	3.00	1.27	.95			
SIBLINGS	3.76	3.43	1.04	1.33			
DRINKING	1.62	3.14***	1.02	1.20	1	19.69 (1,40)	.001
MOVIES	3.24	3.24	1.18	1.18			
RELATIVES	3.24	3.52	1.30	.98	4	4.83 (1,37)	.05
DATING	3.76	3.48	.94	1.03	2	4.29 (1,39)	.05
GPA	3.22	2.46***	.61	.69			
LOC	9.14	10.52	4.09	3.64			
DEAN	56.67	55.10	12.14	5.15			
IAR+	6.81	5.67**	1.25	1.43			
IAR-	7.00	5.76**	2.14	1.67			
NETTLER	59.38	55.05**	5.87	7.44			

Mean Difference: *= $p < .10$, **= $p < .05$, ***= $p < .001$
All 26 Variables: $F=3.93$, $df=26,15$ ($p < .005$)

Number of Cases Clasified Into Groups:

	NOS	SMO	
NOS	20	1	Lubin's $t = 6.16$ ($p < .001$) 97% accuracy
SMO	0	21	

TABLE G

Step-wise Discriminant Analysis of SI Value Ratings

(Smoking and Marijuana Omitted)

Auxiliary College Sample

Non-smokers (NOS) and Smokers (SMO)
(n=38) (n=51)

	Means		Standard Deviations		Step Entered	F Value to Enter (df)	p
	NOS	SMO	NOS	SMO			
EATING	3.76	3.55	.99	.95			
BOOKS	3.73	3.89	.98	1.03			
FRIENDS	4.59	4.16**	.57	.89	2	4.83 (1,86)	.05
MUSIC	3.82	3.82	.93	.95			
SPORTS	3.33	3.26	1.05	1.08			
SCHOOL	4.22	3.94	.70	1.01			
JOB	3.69	3.58	1.01	1.03			
FATHER	3.98	4.03	1.10	1.20			
HOBBIES	3.08	3.55**	.96	1.22	3	4.97 (1,85)	.05
MONEY	3.94	3.61	1.01	1.17			
CARS	3.24	3.11	1.21	.98			
MOTHER	4.31	4.08	.81	1.19			
SLEEPING	4.00	3.89	.85	1.01			
TV	2.69	2.24**	1.14	.91			
CHURCH	3.43	2.58**	1.32	1.43	1	8.51 (1,87)	.01
SIBLINGS	4.11	3.89	.95	1.03			
DRINKING	1.61	1.76	1.00	.94			
MOVIES	2.90	2.89	.90	.86			
RELATIVES	3.02	2.79	1.03	1.19			
DATING	4.02	3.97	.84	1.13			
SAD	4.45	5.18	4.63	4.32			
SD	5.08	4.32	2.43	2.23			
F	.29	.32	.46	.47			
LOC	8.39	9.34	3.20	4.56			

Mean Difference: *= $p < .10$, ** $p < .05$, ***= $p < .001$
 All 24 Variables: $F=1.39$, $df=24,64$ (n.s.)

Number of Cases Classified Into Groups:

	NOS	SMO	
NOS	40	11	Lubin's $t = 5.05$ ($p < .001$) 77% accuracy
SMO	9	29	

TABLE H

Step-wise Discriminant Analysis of SI Value Ratings
and Other Measures

Auxiliary College Sample

Low Addictive (LO) and High Addictive (HI) Smokers
(n=22) (n=16)

	Means		Standard Deviations		Step Entered	F Value to Enter (df)
	LO	HI	LO	HI		
SAD	4.68	5.88	3.71	5.08		
SD	4.18	4.50	2.30	2.19		
F-R	.27	.38	.46	.50		
LOC	9.41	9.25	4.60	4.65		
EATING	3.77	3.25*	.97	.86		
BOOKS	4.00	3.75	.93	1.18		
FRIENDS	4.18	4.13	.91	.89		
MUSIC	4.05	3.50*	.90	.97		
SPORTS	3.45	3.00	1.22	.82		
SCHOOL	4.09	3.75	.92	1.13		
JOB	3.55	3.63	1.10	.96		
FATHER	4.09	3.94	1.23	1.18		
HOBBIES	3.77	3.25	1.34	1.00		
MONEY	3.64	3.56	1.33	.96		
SMOKING	2.41	2.44	.85	1.03		
CARS	3.18	3.00	1.01	.97		
MOTHER	4.27	3.81	.98	1.42		
SLEEPING	3.95	3.81	1.13	.83		
TV	2.18	2.31	.85	1.01		
CHURCH	2.95	2.06*	1.53	1.12		
SIBLINGS	4.09	3.63	1.02	1.02		
DRINKING	1.41	2.25**	.73	1.00	1	8.96 (1,36)
MOVIES	2.95	2.81	.79	.98		
RELATIVES	3.05	2.44	1.36	.81		
MARIJUANA	1.32	2.06**	1.04	1.00	3	6.08 (1,34)
DATING	4.32	3.50**	.99	1.15	2	6.30 (1,35)

Mean Difference: *= $p < .10$, **= $p < .05$, ***= $p < .001$
 All 26 Variables: $F=2.02$, $df=26,11$ (n.s.)

Number of Cases Classified Into Groups:

	LO	HI	
LO	22	0	Lubin's $t = 5.95$ ($p < .001$) 100% accuracy
HI	0	16	

PUBLIC OPINION SCALE
(DEAN'S ALIENATION SCALE)

Below are some statements regarding public issues, with which some people agree and others disagree. Please give your own opinion about these items, i.e., whether you agree or disagree, and how much, with the items as they stand.

Please darken the appropriate spaces on your answer sheet in the block designated "PUBLIC OPINION SCALE". Use the following 5 point scale:

- SA (If you Strongly Agree with the item)
 A (If you Agree with the item)
 U (If you are Uncertain with respect to that item)
 D (If you Disagree with the item)
 SD (If you Strongly Disagree with the item)

1. Sometimes I feel all alone in the world.
2. I worry about the future facing today's children.
3. I don't get invited out by friends as often as I'd really like.
4. The end often justifies the means.
5. Most people today seldom feel lonely.
6. Sometimes I have the feeling that other people are using me.
7. People's ideas change so much that I wonder if we'll ever have anything to depend on.
8. Real friends are as easy as ever to find.
9. It is frightening to be responsible for the development of a little child.
10. Everything is relative, and there just aren't any definite rules to live by.
11. One can always find friends if he shows himself friendly.
12. I often wonder what the meaning of life really is.

13. There is little or nothing I can do towards preventing a major "shooting" war.
14. The world in which we live is basically a friendly place.
15. There are so many decisions that have to be made today that sometimes I could just "blow up".
16. The only thing one can be sure of today is that he can be sure of nothing.
17. There are few dependable ties between people any more.
18. There is little chance for promotion on the job unless a man gets a break.
19. With so many religions abroad, one doesn't really know which to believe.
20. We're so regimented today that there's not much room for choice even in personal matters.
21. We are just so many cogs in the machinery of life.
22. People are just naturally friendly and helpful.
23. The future looks very dismal.
24. I don't get to visit friends as often as I'd really like.

PLEASE CHECK TO MAKE CERTAIN THAT YOU DARKENED YOUR ANSWERS TO THESE 24 ITEMS IN THE BLOCK DESIGNATED "PUBLIC OPINION SCALE" ON YOUR ANSWER SHEET.

INTERESTS SCALE
(NETTLER'S ALIENATION SCALE)

Below are 17 questions about various events, objects, or beliefs. After each item you have a choice of 5 responses. Please select the one response that comes closest to your own way of thinking.

PLACE YOUR ANSWERS TO EACH ITEM BY DARKENING THE APPROPRIATE SPACE IN THE BLOCK DESIGNATED "INTERESTS SCALE" ON YOUR ANSWER SHEET.

1. If you were of voting age would you vote in the national elections?
a. never
b. seldom
c. occasionally
d. frequently
e. always
2. Do you enjoy TV?
a. very much
b. usually
c. neutral
d. seldom
e. not at all
3. What do you think of the new model cars?
a. I have no interest in them at all
b. I have little interest in them
c. neutral interest
d. I have some interest
e. I am greatly interested
4. Do you read the Reader's Digest?
a. I read every issue I see
b. I frequently read it
c. occasionally
d. seldom
e. never
5. Do you think young people are generally a nuisance to their parents?
a. definitely yes
b. yes
c. undecided
d. no
e. definitely no
6. Were you interested in the most recent national elections?
a. very much
b. somewhat
c. neutral
d. rarely
e. not at all

7. Would you be interested, at the right age, in having children of your own?
a. never
b. probably not
c. undecided
d. probably yes
e. definitely
8. Do you like to participate in church activities?
a. never
b. seldom
c. occasionally
d. frequently
e. always
9. Do national sports (football, baseball, etc.) interest you?
a. never
b. seldom
c. occasionally
d. frequently
e. always
10. Do you feel most married people lead trapped and frustrated lives?
a. strongly feel that way
b. tend to agree
c. undecided
d. tend to disagree
e. strongly disagree
11. Do you feel you could just as easily live in another society--past or present?
a. definitely not
b. probably not
c. undecided
d. probably could
e. definitely could
12. Do you think most politicians are sincerely interested in the public's welfare or are they more interested in their welfare?
a. only their own
b. mostly their own
c. undecided
d. mostly public's
e. only public's
13. Do you think religion is mostly myth or mostly truth?
a. mostly truth
b. some truth
c. undecided
d. some myth
e. mostly myth
14. "Life, as most men live it, is meaningless." Do you agree or disagree?
a. agree strongly
b. agree
c. undecided
d. disagree
e. disagree strongly

15. For yourself, assuming you could carry out your decision, do you think a single life or married life would be the more satisfactory for you?
- | | |
|-----------------------|----------------------|
| a. definitely married | d. probably single |
| b. probably married | e. definitely single |
| c. undecided | |
16. Do you believe human life is an expression of a divine purpose or is it only the result of chance and evolution?
- | | |
|-------------------|----------------------|
| a. agree strongly | d. disagree |
| b. agree | e. disagree strongly |
| c. undecided | |

PLEASE CHECK TO MAKE CERTAIN THAT YOU DARKENED YOUR ANSWERS TO THESE 17 ITEMS IN THE BLOCK DESIGNATED "INTERESTS SCALE" ON YOUR ANSWER SHEET.

QUESTIONNAIRE

(SOCIAL DESIRABILITY, SOCIAL AVOIDANCE AND DISTRESS,
AND FREQUENCY-RESPONSE SCALES)

Here is a series of statements which a person might use to describe himself. Read each statement and decide whether or not it describes you. Then indicate your answer by circling either the T or F.

If you agree with the statement or feel that it does describe you, draw a circle around the T (TRUE). If you disagree with a statement or feel that it is not descriptive of you, draw a circle around F (FALSE). Answer every statement either true or false, even if you are not completely sure of your answer.

- T F 1. I feel relaxed even in unfamiliar social situations.
- T F 2. It is easy for me to relax when I am with strangers.
- T F 3. No matter who I'm talking to, I'm always a good listener.
- T F 4. I have no particular desire to avoid people.
- T F 5. I often find social occasions upsetting.
- T F 6. There have been occasions when I took advantage of someone.
- T F 7. I have no sense of touch in my fingers.
- T F 8. I usually feel calm and comfortable at social occasions.
- T F 9. I am usually at ease when talking to someone of the opposite sex.
- T F 10. If I were exploring a strange place at night, I would want to carry a flashlight.
- T F 11. I am sometimes irritated by people who ask favors of me.
- T F 12. I try to avoid talking to people unless I know them well.
- T F 13. I have never deliberately said something that would hurt someone's feelings.

- T F 14. If the chance comes to greet new people, I often take it.
- T F 15. I have never ridden in an automobile.
- T F 16. I often feel nervous or tense in casual get-togethers in which both sexes are present.
- T F 17. It is sometimes hard for me to go on with my work if I am discouraged.
- T F 18. I am usually nervous with people unless I know them well.
- T F 19. Being introduced to people makes me tense and nervous.
- T F 20. I would have a hard time keeping my mind a complete blank.
- T F 21. There have been occasions when I felt like smashing things.
- T F 22. Even though a room is full of strangers, I may enter it anyway.
- T F 23. I would avoid walking up and joining a large group of people.
- T F 24. I sometimes try to get even rather than forgive and forget.
- T F 25. I have a number of outfits of clothing, each of which cost several thousand dollars.
- T F 26. I often feel on edge when I am with a group of people.
- T F 27. I tend to withdraw from people.
- T F 28. I always try to practice what I preach.
- T F 29. I don't mind talking to people at parties or social gatherings.
- T F 30. I have attended school at some time during my life.
- T F 31. I often think up excuses in order to avoid social engagements.

- T F 32. I never hesitate to go out of my way to help someone in trouble.
- T F 33. I sometimes take the responsibility for introducing people to each other.
- T F 34. I try to avoid formal social occasions.
- T F 35. I have never intensely disliked anyone.
- T F 36. I find it easy to relax with other people.

PERSONAL BELIEF QUESTIONNAIRE

(LOCUS OF CONTROL)

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

Please answer these items carefully but do not spend too much time on any one item. Be sure to find an answer for every choice. Find the number of the item on the answer sheet and darken the space under the letter "a" or "b" which you believe as the statement more true. PLACE YOUR RESPONSES IN THE BLOCK DESIGNATED "PERSONAL BELIEF QUESTIONNAIRE" ON YOUR ANSWER SHEET.

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

In summary:

1. Select the statement you BELIEVE to be more true.
2. Answer items CAREFULLY but do not spend too much time on any item.
3. Respond to every pair--select the one you more strongly believe.
4. Try to respond to each item INDEPENDENTLY.

PERSONAL BELIEF QUESTIONNAIRE

1. a. Children get into trouble because their parents punish them too much.
b. The trouble with most children nowadays is that their parents are too easy with them.
2. a. Many of the unhappy things in people's lives are partly due to bad luck.
b. People's misfortunes result from the mistakes they make.
3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
b. There will always be wars, no matter how hard people try to prevent them.
4. a. In the long run people get the respect they deserve in this world.
b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5. a. The idea that teachers are unfair to students is nonsense.
b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
6. a. Without the right breaks one cannot be an effective leader.
b. Capable people who fail to become leaders have not taken advantage of their opportunities.
7. a. No matter how hard you try some people just don't like you.
b. People who can't get others to like them don't understand how to get along with others.
8. a. Heredity plays the major role in determining one's personality.
b. It is one's experiences in life which determine what they're like.
9. a. I have often found that what is going to happen will happen.
b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
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 is really useless.

11. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
b. Getting a good job depends mainly on being in the right place at the right time.
12. a. The average citizen can have an influence in government decisions.
b. This world is run by the few people in power, and there is not much the little guy can do about it.
13. a. When I make plans, I am almost certain that I can make them work.
b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
14. a. There are certain people who are just no good.
b. There is some good in everybody.
15. a. In my case getting what I want has little or nothing to do with luck.
b. Many times we might 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 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 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.

ACADEMIC QUESTIONNAIRE
(INTELLECTUAL ACADEMIC RESPONSIBILITY)

INSTRUCTIONS: This questionnaire describes a number of common experiences most of you have in your daily lives. These statements are presented one at a time, and following each are two possible answers. Read the description of the experience carefully, and then look at the two answers. Choose the one that most often describes what happens to you. If you feel that choice A best describes what happens to you, darken the space under "A" on your answer sheet; if choice B describes it better, then darken "B" instead.

PLACE YOUR ANSWERS IN ANSWER SHEET BLOCK DESIGNATED "ACADEMIC QUESTIONNAIRE". THERE ARE 20 ITEMS ON THIS SCALE.

1. When you do well on a test at school, is it more likely to be
 - A. because you studied for it, or
 - B. because the test was especially easy?
2. When you have trouble understanding something in school, is it usually
 - A. because the teacher didn't explain it clearly, or
 - B. because you didn't listen carefully?
3. Suppose your parents say you are doing well in school. Is this likely to happen
 - A. because your school work is good, or
 - B. because they are in a good mood?
4. Suppose you did better than usual in a subject at school. Would it probably happen
 - A. because you tried harder, or
 - B. because someone helped you?
5. If you solve a puzzle quickly, is it
 - A. because it wasn't a very hard puzzle, or
 - B. because you worked on it carefully?
6. Suppose you study to become a teacher, scientist, or doctor and you fail. Do you think this would happen
 - A. because you didn't work hard enough, or
 - B. because you needed some help, and other people didn't give it to you?

7. When you learn something quickly in school, is it usually
 - A. because you paid close attention, or
 - B. because the teacher explained it carefully?
8. When you find it hard to work arithmetic or math problems at school, is it
 - A. because you didn't study well enough before you tried them, or
 - B. because the teacher gave problems that were too hard?
9. When you forget something you heard in class, is it
 - A. because the teacher didn't explain it very well, or
 - B. because you didn't try very hard to remember?
10. When you don't do well on a test at school, is it
 - A. because the test was especially hard, or
 - B. because you didn't study for it?
11. When you win at a game of cards or checkers, does it happen
 - A. because you play real well, or
 - B. because the other person doesn't play well?
12. If people think you're bright or clever, is it
 - A. because they happen to like you, or
 - B. because you usually act that way?
13. Suppose you don't do as well as usual in a subject at school. Would this probably happen
 - A. because you weren't as careful as usual, or
 - B. because somebody bothered you and kept you from working?
14. Suppose your parents say you aren't doing well in your school work. Is this likely to happen more
 - A. because your work isn't very good, or
 - B. because they are feeling cranky?
15. Suppose you are showing a friend how to play a game and he has trouble with it. Would that happen
 - A. because he wasn't able to understand how to play, or
 - B. because you couldn't explain it well?

16. When you find it wasy to work arithmetic or math problems at school, is it usually
 - A. because the teacher gave you especially easy problems, or
 - B. because you studied your book well before you tried them?
17. When you remember something you heard in class, is it usually
 - A. because you tried hard to remember, or
 - B. because the teacher explained it well?
18. If you can't work a puzzle, is it more likely to happen
 - A. because you are not especially good at working puzzles, or
 - B. because the instructions weren't written clearly enough?
19. If your parents tell you that you are bright or clever, is it more likely
 - A. because they are feeling good, or
 - B. because of something you did?
20. Suppose you're not sure about the answer to a question your teachers asks you and the answer you give turns out to be wrong. Is it likely to happen
 - A. because she was more particular than usual, or
 - B. because you answered too quickly?

PLEASE CHECK TO MAKE CERTAIN THAT YOU DARKENED YOUR ANSWERS TO THESE 20 ITEMS IN THE BLOCK DESIGNATED "ACADEMIC QUESTIONNAIRE" ON YOUR ANSWER SHEET.

On the other hand, if you feel just the opposite, that that item is extremely powerful in determining how you think and feel, how you spend your time, how you act, etc., then you would mark:

INFLUENCE:

_____ : _____ : _____ : _____ : _____ : _____ : $\frac{X}{\text{EXTREMELY STRONG}}$

If, however, you feel that the influence for any item lies somewhere between NONE AT ALL and EXTREMELY STRONG, decide which of the remaining 5 spaces best describes your feelings and make a check mark in that space.

- REMEMBER:
1. Mark each item so it shows your true feelings.
 2. Do NOT skip any items.
 3. Make only one check mark for each item.

WAIT FOR THE SIGNAL TO TURN THE PAGE

INFLUENCE RATINGS

INFLUENCE:

:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
NONE AT ALL	SLIGHT	SOMEWHAT BELOW AVERAGE	ABOUT AVERAGE	SOMEWHAT ABOVE AVERAGE	STRONG	EXTREMELY STRONG

CARS

-----:-----:-----:-----:-----:-----:

MOTHER

-----:-----:-----:-----:-----:-----:

SLEEP

-----:-----:-----:-----:-----:-----:

TELEVISION

-----:-----:-----:-----:-----:-----:

CHURCH

-----:-----:-----:-----:-----:-----:

DRINKING (beer, wine, and liquor)

-----:-----:-----:-----:-----:-----:

EATING

-----:-----:-----:-----:-----:-----:

BOOKS

-----:-----:-----:-----:-----:-----:

FRIENDS

-----:-----:-----:-----:-----:-----:

MUSIC (listening to phonographs, radios, etc., not playing an instrument)

-----:-----:-----:-----:-----:-----:

SPORTS (actual participation in sports in school and on your own)

_____ : _____ : _____ : _____ : _____ : _____

MOVIES

_____ : _____ : _____ : _____ : _____ : _____

RELATIVES (not counting your parents and brothers and sisters)

_____ : _____ : _____ : _____ : _____ : _____

MARIJUANA

_____ : _____ : _____ : _____ : _____ : _____

DATING

_____ : _____ : _____ : _____ : _____ : _____

CHILDREN

_____ : _____ : _____ : _____ : _____ : _____

ANIMALS

_____ : _____ : _____ : _____ : _____ : _____

SCHOOL

_____ : _____ : _____ : _____ : _____ : _____

JOB

_____ : _____ : _____ : _____ : _____ : _____

FATHER

_____ : _____ : _____ : _____ : _____ : _____

HOBBIES (including playing a musical instrument)

_____ : _____ : _____ : _____ : _____ : _____

MONEY

_____ : _____ : _____ : _____ : _____ : _____

SMOKING (pipe, cigars, and cigarettes)

STOP! WAIT FOR THE SIGNAL TO TURN THE PAGE

On the next page we will rate the same items but with quite a different idea in mind. You have just rated each item on how strong you feel it influences your behavior. This time decide how much you value each item. How worthwhile do you feel each item is to you personally? How positive or negative do you feel about each item? Notice that your ratings for VALUE may be quite different from the ones you just made for INFLUENCE. For example, just because some person, object, or activity may have a strong influence on your behavior does not necessarily mean you also place a high value on that item or have a high positive feeling about it. A prisoner, for instance, may feel that his captors have a strong influence over what he does, but he may feel quite negative about them and thus place a low value on them.

We will use the same type of rating scale as before but notice that there are different terms that you have to think about before deciding where you want to place your check mark:

VALUE:

EXTREMELY	CONSI-	SOMEWHAT	ABOUT	SOME-	CONSIDER-	EXTREMELY
LOW	DERABLY	BELOW	AVERAGE	WHAT	ABLY	HIGH
	LOW	AVERAGE		ABOVE	HIGH	
				AVERAGE		

- REMEMBER:
1. Place your check mark in that space which best describes how much you value each item.
 2. Place only one mark after each item.
 3. Do NOT skip any items.

WAIT FOR THE SIGNAL TO TURN THE PAGE

VALUE RATINGS

VALUE:

:-----:	:-----:	:-----:	:-----:	:-----:	:-----:	:-----:
EXTREMELY LOW	CONSIDER- ABLY LOW	SOMEWHAT BELOW AVERAGE	ABOUT AVERAGE	SOMEWHAT ABOUT AVERAGE	CONSIDER- ABLY HIGH	EXTREMELY HIGH

EATING

-----:-----:-----:-----:-----:-----:

BOOKS

-----:-----:-----:-----:-----:-----:

FRIENDS

-----:-----:-----:-----:-----:-----:

MUSIC (listening to phonographs, radios, etc., not playing an instrument)

-----:-----:-----:-----:-----:-----:

SPORTS (actual participation in sports in school and on your own)

-----:-----:-----:-----:-----:-----:

SCHOOL

-----:-----:-----:-----:-----:-----:

JOB

-----:-----:-----:-----:-----:-----:

FATHER

-----:-----:-----:-----:-----:-----:

HOBBIES (including playing a musical instrument)

-----:-----:-----:-----:-----:-----:

MONEY

-----:-----:-----:-----:-----:-----:

SMOKING (pipe, cigars, and cigarettes)

-----:-----:-----:-----:-----:-----:

CARS

_____ : _____ : _____ : _____ : _____ : _____

MOTHER

_____ : _____ : _____ : _____ : _____ : _____

SLEEP

_____ : _____ : _____ : _____ : _____ : _____

TELEVISION

_____ : _____ : _____ : _____ : _____ : _____

CHURCH

_____ : _____ : _____ : _____ : _____ : _____

DRINKING (beer, wine, and liquor)

_____ : _____ : _____ : _____ : _____ : _____

MOVIES

RELATIVES (not counting your parents and brothers and sisters)

_____ : _____ : _____ : _____ : _____ : _____

MARIJUANA

_____ : _____ : _____ : _____ : _____ : _____

DATING

_____ : _____ : _____ : _____ : _____ : _____

CHILDREN

_____ : _____ : _____ : _____ : _____ : _____

ANIMALS

_____ : _____ : _____ : _____ : _____ : _____

STOP!

WAIT FOR THE SIGNAL TO TURN THE PAGE

Finally, we will rate the items on a third dimension. This time when you go over each item decide how often that item influences you and the way you feel, think, and act. Again, keep in mind that you are rating the items on a different idea from what you did on your first two ratings. As an example, somebody might rate a surfboard as having an average INFLUENCE on his behavior and rate its VALUE as being considerably high. His ratings for OCCURRENCE would depend on how he actually gets to go surfing as well as how much time he thinks about surfing.

Use the following scale to make your ratings of the OCCURRENCE dimension:

OCCUR:

_____	_____	_____	_____	_____	_____	_____
NEVER	RARELY	BELOW AVERAGE	ABOUT AVERAGE	ABOVE AVERAGE	FRE- QUENTLY	ALMOST ALL THE TIME

- REMEMBER:
1. Place your check mark in that space which best describes how often each item influences you.
 2. Place only one mark after each item.
 3. Do NOT skip any items.

WAIT FOR THE SIGNAL TO TURN THE PAGE

OCCURRENCE RATINGS

OCCURS:

_____ : _____ : _____ : _____ : _____ : _____ : _____
 NEVER RARELY BELOW ABOUT ABOVE FRE- ALMOST ALL
 AVERAGE AVERAGE AVERAGE QUENTLY THE TIME

SCHOOL

_____ : _____ : _____ : _____ : _____ : _____

JOB

_____ : _____ : _____ : _____ : _____ : _____

FATHER

_____ : _____ : _____ : _____ : _____ : _____

HOBBIES (including playing a musical instrument)

_____ : _____ : _____ : _____ : _____ : _____

MONEY

_____ : _____ : _____ : _____ : _____ : _____

SMOKING (pipe, cigars, and cigarettes)

_____ : _____ : _____ : _____ : _____ : _____

MOVIES

_____ : _____ : _____ : _____ : _____ : _____

RELATIVES (not counting your parents and brothers and sisters)

_____ : _____ : _____ : _____ : _____ : _____

MARIJUANA

_____ : _____ : _____ : _____ : _____ : _____

DATING

_____ : _____ : _____ : _____ : _____ : _____

CHILDREN

_____ : _____ : _____ : _____ : _____ : _____

ANIMALS

_____ : _____ : _____ : _____ : _____ : _____

EATING

: : : : : :

BOOKS

: : : : : :

FRIENDS

: : : : : :

MUSIC (listening to phonographs, radios, etc., not playing an instrument)

: : : : : :

SPORTS (actual participation in sports in school and on your own)

: : : : : :

CARS

: : : : : :

MOTHER

: : : : : :

SLEEP

: : : : : :

TELEVISION

: : : : : :

CHURCH

: : : : : :

DRINKING (beer, wine, and liquor)

: : : : : :

STOP!

WAIT FOR THE SIGNAL TO TURN THE PAGE

SMOKING QUESTIONNAIRE

1. On the average, how often do you smoke cigarettes? Check ONE of the following:

NON-SMOKERS: ___ I have never smoked cigarettes.

EX-SMOKERS: ___ I used to smoke about ___ cigarettes a day but quit _____ ago.

SMOKERS: I smoke (check ONE of the following):

___ one or two a day ___ about a pack a day

___ several but less ___ more than a pack
than $\frac{1}{2}$ a pack a day a day

___ about $\frac{1}{2}$ a pack a day ___ more than 2 packs
a day

2. Do you smoke a pipe? ___yes ___no If yes, about how many pipefuls a week? _____
3. Do you smoke cigars? ___yes ___no If yes, about how many cigars a week? _____
4. How long ago did you first start smoking an average of one or more cigarettes a day? _____
5. Have you ever tried to stop smoking? ___yes ___no If yes, about how many times _____
6. In the space below LIST BRIEFLY all the important reasons you can think of that explain why you: a) started smoking, and b) continue to smoke.

STARTED:

CONTINUE:

--	--

SMOKING ATTITUDES

(JOHNSON'S SMOKING RATIONALIZATIONS)

INSTRUCTIONS: Below are some attitudes about smoking. Read each statement and indicate the amount of agreement or disagreement you have with it, using the following scale:

SA = STRONGLY AGREE

D = DISAGREE

A = AGREE

SD = STRONGLY DISAGREE

U = UNDECIDED

DARKEN YOUR ANSWERS IN THE BLOCK DESIGNATED "SMOKING ATTITUDES" ON YOUR ANSWER SHEET. PLEASE RESPOND TO EVERY ITEM.

NON-SMOKERS & EX-SMOKERS: PLEASE ANSWER THIS SCALE ALSO. RESPOND THIS TIME AS YOUR SELF, I.E., DO NOT RESPOND AS YOU THINK THE "AVERAGE SMOKER" WOULD, ANSWER AS YOU ACTUALLY FEEL.

1. The tobacco companies were right in their decision not to advertise cigarettes in college newspapers.
2. Cigarette advertisements have been influential in inducing young people to smoke.
3. Smokers have a higher death-rate than non-smokers.
4. Inconsistencies in the reports examined by the Surgeon General's Office give considerable support to the view that the dire warnings that have been given about lung cancer and smoking are premature.
5. Smoking is a cause of lung cancer.
6. The pleasures gained from smoking are not worth possible ill-effects.
7. Cigarette smoking is a health hazard of sufficient importance in the United States to warrant appropriate remedial action.
8. That many old people have smoked for long periods of time and have not developed lung cancer is reasonably clear evidence that lung cancer is not caused by smoking.
9. The psychological effects of quitting are worse than the physiological advantage of quitting.
10. That non-smokers develop lung cancer is reasonably clear evidence that smoking does not cause lung cancer.

11. Since the decision on whether to smoke or to continue smoking is a personal choice of the individual, pressures to quit should not be exerted on the smoker.
12. Air pollution (including smog and auto exhaust fumes) is as important a determinant of lung cancer as is cigarette smoking.
13. The statistics which demonstrate a relationship between smoking and health hazards are misleading.
14. The gains in weight that comes when a person quits smoking, and the consequent risks to the heart, offset any health gains that might result from the discontinuation from smoking.
15. If a man has smoked for a reasonably long period of time, and hence proven he is not especially vulnerable to the effects of cigarettes, it would seem silly for him to quit for reasons of health.
16. A judgement on the possible causal relationships between smoking and lung cancer should be withheld until more evidence is gathered.
17. Whether a smoker actually develops lung cancer seems to depend more on genetic factors than on the amount of smoking he engages in.
18. Each cigarette pack should include the following message:
WARNING! CIGARETTE SMOKING IS RELATED TO LUNG CANCER
AND OTHER ILLNESSES.
19. The tobacco companies are wrong in using pictures of attractive young people in their cigarette advertisements.
20. The practice of dispensing free cigarettes to college students should be stopped.
21. Survival rations should not include cigarettes in the future.
22. The benefits derived from the use of cigarettes tax monies on public schools, foreign aid, etc., are not sufficient to offset ill-effects that result from smoking.
23. In order to provide an appropriate model for their patients, physicians should stop smoking.

24. Lung cancer patients are more likely to be smokers or ex-smokers than people who have not developed lung cancer.
25. The increase in lung cancer is attributed to smoking and not just to improvements in diagnosis.
26. There seems to be no simple cause-and-effect relationship between a complex product like tobacco and lung cancer.
27. Smokers who quit smoking become irritable.
28. The higher rates of lung cancer in geographical areas in which the air is polluted is evidence that lung cancer is not caused by cigarette smoking.
29. To continue smoking is stupid.
30. The ill-effects of smoking have been exaggerated.
31. The cigarette industry should be forced to warn against its own product.
32. The average smoker prefers not to think of the possible ill-effects of smoking.
33. A husband who truly cares for the welfare of his family will quit smoking.
34. A person who was wise would never start smoking in the first place.
35. A person would be foolish to quit smoking when it seems likely that a non-cancer producing cigarette will be developed in the near future.

PLEASE CHECK TO MAKE CERTAIN THAT YOU DARKENED YOUR ANSWERS TO THESE 35 ITEMS IN THE BLOCK DESIGNATED "SMOKING ATTITUDES" ON YOUR ANSWER SHEET.

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