Personality and Smoking: A Complex Multivariate Problem

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PERSONALITY AND SMOKING: A COMPLEX
MULTIVARIATE PROBLEM

by
Dale A. Bespalec

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

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VITA

The author, Dale Anthony Bespalec, is the son of Mildred (Glogovsky) Bespalec and the late Anthony Bespalec, Jr. He was born September 21, 1951 in Waukegan, Illinois.

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In September, 1973 he was granted a National Institute of Mental Health fellowship in clinical psychology at Loyola University of Chicago. He received an assistantship in the department of psychology the following year. In the latter position he was graduate assistant to the director of clinical training.

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INTRODUCTION

While cigarette smoking has been acknowledged as a major health hazard for millions of people, attempts to alter the smoking behavior of these persons have generally met with limited success (Hunt & Bespalec, 1974). Hunt and Bespalec (1974), in their literature review, note the complexity of the problem in regard to treatment effectiveness. The apparent lack of superiority among the different modes of treatment implies a complex multivariate problem in which each systematic approach is being applied to a limited aspect of the total smoking behavior picture. Several suggestions have been supplied to meet the problems presented by this state of affairs. One of the most controversial areas of investigation has been that of personality factors which distinguish the smoker from the nonsmoker. It is the purpose of this study to investigate the interrelationship of personality variables and cigarette smoking behavior.

Part of the controversy surrounding the investigation of personality variables and their relationship to smoking centers upon the perceived causation of smoking behavior. Hunt and Matarazzo (1970) have made some rather scathing comments on the usefulness of studying personality in relation to the smoking habit and have presented two major criticisms. The first criticism refers to the abundance of personality measures and the subsequent ease of devising and executing studies. Unfortunately, because of this situation, many studies have
been produced but little agreement has been reached. Due to the wide range of investigation and the numerous operational definitions, little profit was gained from the studies. Coan (1967) made a similar criticism when he reported that personality research in the smoking field has been fixated on haphazardly chosen concepts and a preoccupation with particular devices for personality measurement. The second criticism offered by Hunt and Matarazzo (1970) was that large samples have had the result that small effects reach statistical significance, and further that discrimination among various research groups has been poor. Thus, these group differences that were found, were so small that meaningful individual prediction is nearly impossible or, at best, tentative in nature. Eysenck (1973) generally agrees with these criticisms, and offers as an explanation for this that the majority of studies have looked at personality from a descriptive rather than a causative viewpoint.

Smith (1970) has responded to these critics by stating that a comprehensive and thorough exploration of personality characteristics concerning smokers and nonsmokers has not yet been accomplished, contrary to what Hunt and Matarazzo maintain, and as a consequence such studies are of considerable importance. What becomes very evident from these arguments is the need for clarification of the purposes of the experimental investigations of personality variables with smokers. It appears that while some authors work toward a "type" or descriptive personality pattern among smokers, others are more concerned with finding evidence for personality based causes for the smoking.

There may be value in both of these pursuits provided the question is broadened to include the query of treatment effectiveness.
The motivating factors in the personality which are at the basis for the individual's developing the cigarette addiction, may also serve as a basis for maintaining the habit once it is established. Best (1975) and Hunt, Matarazzo and Weiss (1976) have all pointed to the possibility that smoking behavior and the modification of such behavior are both two-stage processes. Hunt and Bespalec (1974) and Hunt et al. (1976) offer the idea of a two step learning process. One step involves the acquisition of the behavior. The second step is an independent process which maintains the behavior. Best (1975) sees the modification of smoking involving the achievement of abstinence and then the maintaining of abstinence.

Viewing the question of the importance of personality variables in smokers as a valid area of study in the light of these previous suggestions, one is encouraged to find that personality may be seen not only as a possible causative system in the development of a habit, but also in a potential sustenance role. As Best (1975) cautions, "failure to include relevant client variables in experimental designs may mask the effects of therapeutic procedures" (p. 1). He continues that "tailoring treatment strategies to subject characteristics can augment the maintenance of therapeutic change" (p. 1). There is some evidence to support the usefulness of using personality variables to predict smoking behavior and success in smoking treatment programs. Ahmed (1972) studied 111 males and 106 females who were residents of London, Ontario with the Jackson Personality Research Form (PRF), the Maudsley Personality Inventory (MPI) and the California Personality Inventory (CPI). Ahmed's results indicated that personality characteristics substantially contributed to prediction of cigarette consumption level.
for males but not for females. Similarly, in a study of 142 undergraduates using the Rotter Internal-External Locus of Control Scale (I-E) and the Fate and Belief Scales, Foss (1973) reported that while 70% of the internal control students did cut down or have stopped smoking two years after the measures were taken, only 46% of the externally oriented students did. This difference was statistically significant ($p < .01$). Foss used these results to postulate a social-smoker profile which has been used to screen smokers with a good prognosis for maintaining abstinence from those with less optimistic prognoses. It appears that personality variables when studied with the goal of enhancing treatment application and effectiveness, may serve as a screening device for the application of various methodological techniques and their degree. This approach may allow a much more economical and problem-oriented, individualized approach to treatment.

Further evidence is presented by Jacobs (1972) who administered a battery of tests to 104 males who each smoked at least a pack of cigarettes daily for an average of over twenty years. These men had sought treatment and participated in a ten week program to extinguish the smoking habit. The four factors that were related to treatment success were: (a) defiant, impulsive, danger-seeking traits; (b) constricted, guarded, and socially-isolated traits; (c) perception of one's mother as having been demanding, cold and harsh; and (d) previous failure to abstain from cigarettes for at least one week. The results indicated that the first three factors were negatively related to quitting smoking. All four variables, when dichotomized at the median, did differentiate successful clients from unsuccessful ones. The battery as a whole was accurate in 69% of the cases. Caplan, Cobb and
French (1975) also report that employees from NASA who were categorized as Type A personalities exhibited a different perception of the environment that made it more difficult for them to stop smoking. Caplan et al. defined Type A personalities as those persons who exhibited the traits of hard-driving persistence, competitiveness, high job involvement and stress from work overload. Finally, Eysenck (1973) viewing personality as a causative factor in smoking behavior has postulated that introverts and extraverts, as defined by scores on the Eysenck Personality Inventory (EPI), smoke for different reasons. Eysenck reports a great deal of data which support his contention that introverts smoke to reduce arousal while extraverts smoke to increase arousal.

Unfortunately, not all of the results are consistently in this direction. Dies, Honeyman, Reznikoff, and White (1969) when studying 76 sets of twins, found a significant relationship between smoking behavior and scores on the psychopathic deviance scale (Pd) of the MMPI. However, they also reported that when both twins smoked cigarettes, their personalities were more similar than were the personalities of twins one of whom smoked and the other did not. They warn that it may be unwise to look for any personality pattern among smokers.

From the preceding evidence, two main objectives seem to be presented to researchers interested in the area of personality factors and smoking. The first objective would be to clarify the results of the relationship between personality variables and smoking behavior. Secondly, researchers need to look for personality and treatment variable interactions. The purpose of this study is to apply itself to the first objective. With the intention of looking at smoking
behavior and personality factors as a multivariate interaction system, the author sought to clarify the relationship of personality factors with smoking behavior.
Overview

Because of the complex nature of the current state of affairs in this area or research, a further search of the literature was initiated. A great deal of literature has been well summarized by Matarazzo and Saslow (1960), Larson, Haag, and Silvette (1961) and Smith (1970). All of the authors note that many of the studies that they reviewed were haphazardly done and arbitrary in the selection of measurement devices and data manipulation. This point has been emphasized by others in their critical reviews as well (Coan, 1967; Hunt & Matarazzo, 1970). Another consistent difficulty found among the studies was the problem of comparability due to the different classifications of the degree of smoking and the variety of the populations used. Although there appears to be some order in all of this research, much is still left to be desired. Using the Smith (1970) report extensively as a guide to sort out the research as well as a base for an orderly system for categorization, this review is organized into seven categories. These categories are extraversion, locus of control, antisocial tendencies, impulsivity, orality, mental health, and a general miscellaneous category of other personality variables. Although these groupings are arbitrary, this categorization is defended as Smith did, that is, most of the data can be accounted for in reasonable depth by this system. A summary of the research studies is presented in Table 1.
# Table 1
Summary of Report Findings

<table>
<thead>
<tr>
<th>Variable</th>
<th>Positive</th>
<th>Not Significant</th>
<th>Negative</th>
<th>Total&lt;sup&gt;a&lt;/sup&gt;</th>
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<td>2</td>
<td>0</td>
<td>19</td>
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<td>11</td>
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<tr>
<td>Orality</td>
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<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Mental Health</td>
<td>17</td>
<td>16</td>
<td>6</td>
<td>39</td>
</tr>
<tr>
<td>a. Emotional Disturbance or Stability</td>
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<td>1</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>b. Nervousness</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>c. Personality Integration</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>d. Neuroticism</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>e. Anxiety</td>
<td>7</td>
<td>9</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>f. Emotionality</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
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</tbody>
</table>

<sup>a</sup>Some studies report multiple findings.
Extraversion

One of the more extensively studied personality variables in relation to smoking is extraversion. Strong support is given to the hypothesis that extraverted individuals smoke more and are more often smokers than introverted individuals. McArthur, Waldron, and Dickinson (1958) tested 252 college males with the Strong Vocational Interest Blank (SVIB) and found a significant relationship between extraverted interests and smoking behavior. Similarly, Schubert (1959) using the social introversion scale (Si) of the MMPI reported a positive relationship between extraversion and smoking in 22 college males and females. Others using similar populations and instruments have added support to this finding (Cattell & Krug, 1967; Evans, Borgatta, & Bohenstedt, 1967; Schubert, 1965; Smith, 1967). Increasing the generalizability of these findings, other investigators have reported similar findings using different populations. A positive relationship was found between the amount of smoking and extraversion in high school students (Salber & Rochman, 1964; Smith, 1969a) as well as within international groups such as British males (Eysenck, Tarrant, Woolf, & England, 1960; Eysenck, 1963, 1973), Australian college males (Feather, 1963) and Puerto Rican high school students (Smith, 1969b). Recently, Berger (1971) has reworked some previously collected MMPI data by means of item analysis and reports that there is a greater aversion to or nonparticipation in social activities by nonsmokers as compared to smokers. Coan (1973) analyzed a smoking survey of 361 college students by means of a factor analysis and found a significant association between extraversion and smoking behavior overall, but when analyzed using sex as a dichotomous category, male smokers were
found to score higher on extraversion measures than female smokers. Kanekar and Dolke (1970) reported that they found a positive relationship between degree of extraversion and amount smoked in 100 East Indian males, aged 25 to 35, while Lynn and Hayes (1969) using more molar data reported a positive correlation ($r = .69$) between tobacco consumption of some countries (Australia, Canada, Germany, Ireland, Japan, New Zealand, United Kingdom, and U.S.A.) and indices of normative population extraversion levels in those countries.

With the exception of two studies (Lane, Oberman, Mitchell, & Graybiel, 1966; Straits & Sechrest, 1963) extraversion has been positively related to smoking whether the instrument of measurement was the MMPI, the Minnesota Counseling Inventory (MCI), the Sixteen Personality Factor Questionnaire (16PF), peer ratings, specially devised surveys or the EPI. Additionally, a variety of different populations have been studied with comparable results. Sex appears to be one variable which may confound the generality of this relationship.

Locus of Control

Internal-external locus of control is defined by James, Woodruff and Werner (1965) as a measure of "the extent to which a person perceives events as determined by factors intrinsic to himself or manipulable by himself versus the extent to which he views events as determined by fate, chance, or the manipulation of others" (p. 184). The I-E variable has not been as strongly related to smoking as other variables, although there does seem to be a positive trend. Lilienfield (1959) administered the Neuropsychiatric Screening Adjunct (NSA) to 1806 males and females ranging in age from 18 to over 70. The analyses of
the items relating to external locus of control and smoking behavior revealed a positive association. Straits and Sechrest (1963) and James et al. (1965) administered the James test of Internal-External Control to college students and the results indicated a positive relationship between external control and smoking. Hjelle and Clauser (1970) reported mixed results. Four hundred and eighty-three introductory psychology students from Villanova were separated into two groups defined by extreme internal or extreme external locus of control. The internal group consisted of 22 males and 23 females who scored high on internal indices. The other group consisted of 53 males and 26 females who were considered as having exhibited external control. Analysis of the data revealed that externally controlled females smoked more than females who scored high on measures of internal control. The difference between the two groups of males, while in the same direction as that of the females, did not reach significance. Williams (1973) also found the same relationship between external control and smoking in female high school students. Foss (1973) used the Rotter I-E Scale and also reported that there was a positive relationship between external control and smoking behavior. The Rotter Scale was also used by Berman (1973) but despite the positive relationship between smoking behavior and external locus of control that was reported, significance was not achieved by the data.

Although there may be a positive relationship between locus of control and smoking behavior, more investigation is warranted. One of the confounding variables to consider in the investigation of locus of control is the sex of the subject, as it appears that males and females may respond differently to questionnaires measuring locus of control.
**Antisocial Tendencies**

A great deal of data has been collected with regard to the relationship of antisocial tendencies to smoking behavior. Measures of rebelliousness, psychopathic deviance, defiance, misconduct, disagreeableness and noncompliance are all represented under this heading. Again, many different instruments have been used, including the MMPI, CPI, teacher ratings and peer ratings of behavior. While the instruments have varied as widely as the populations studied, one of the most popular devices utilized has been the MMPI. Studies using the MMPI have generally shown positive relationships between the Pd scale and smoking behavior (Berger, 1971; Dies et al., 1969; Evans et al., 1967; McDonald, 1965; Rabbins, 1971; Straits & Seechrest, 1963).

One exception to this finding was reported by Whiskin, Debner and Rhudick (1962) who did not find a relationship between scores on the Pd scale and smoking while studying a population of 402 males and females aged 50 to 90. The age of the respondents may be an important factor, however, when considering these results. Elderly individuals may be less likely to respond positively to antisocial tendency questions that measure risk-taking tendencies in their personality structure. Further, seniors are likely to be less risky in their behavioral as well as belief orientations (Neugarten, 1964). Koponen (1960) studied 1418 adult males with the Aggression subscale of the Edwards Personal Preference Schedule (EPPS) and reported a positive association between heightened scores on this subscale and smoking behavior. Replication of this finding has not been demonstrated however (Smith, 1967; Weatherly, 1965). Reiter (1970) using the EPPS as well, reported that smokers scored significantly higher than nonsmokers on the Change and
the Exhibition subscales of the EPPS, while nonsmokers scored higher on indices of Nurturance and Deference. Reiter interpreted these results to mean that smokers as a group are less socially responsible than nonsmokers. He noted further, however, that the EPPS may not be sensitive enough to study this variable.

Lawton and Phillips (1956), using a questionnaire designed to measure "grouchiness" and "disagreeability" with 63 general medical and surgical patients, reported a positive association between these measures and smoking behavior. It is not reported whether or not the patients were allowed to smoke in the hospital. If they were not allowed to smoke, these results may be partially due to a nicotine withdrawal effect. Comparable results have also been reported elsewhere, however, by two other studies using special questionnaires designed to measure defiance, impetuousness and danger-seeking (Jacobs, Knapp, Anderson, Karush, Meissner, & Richman, 1965; Jacobs, Anderson, Champagne, Karush, Richman, & Knapp, 1966). Another special questionnaire measuring anger in response to stress was used by Thomas (1960) with 657 medical students. A significant positive relationship between stress-related anger and smoking behavior was reported. Lilienfeld (1959) using the NSA and Lane et al. (1966) utilizing the Guilford-Zimmerman Temperament Survey (G-Z) also obtained significant results in the predicted direction of a positive relationship between defiance and danger-seeking, and smoking behavior. Salber and Rochman (1964) and Smith (1969a, 1969b) designed studies which used third party observer ratings of antisocial tendencies. Both the teacher ratings of the antisocial tendencies of students (Salber & Rochman, 1964) and peer ratings of the same variable (Smith, 1969a, 1969b) were found to
strongly support the positive relationship between smoking and antisocial tendencies.

Matarazzo and Saslow (1960) and Weatherly (1965) have suggested the question of artifactual results due to response biases when the measurement of antisocial tendencies is undertaken. Schubert (1965) and Evans et al. (1967) both report that smokers obtain significantly lower lie scores ($L$) on the MMPI than do nonsmokers. These studies support what Weatherly (1965) suggested is a willingness of smokers to acknowledge, to a greater degree than nonsmokers, socially undesirable characteristics in themselves. The reports by Smith (1969a, 1969b) and Stewart and Livson (1966) are not as susceptible to this criticism and support the positive relationship of antisocial tendencies to smoking behavior. Additionally, a greater propensity to acknowledge undesirable characteristics may also be interpreted as a greater feeling of ease with the reporting of such antisocial behaviors on the part of smokers. In such a case, the implication that smokers have defiant or danger-seeking tendencies may still be supported. Also, the ease of reporting may point to a lack of social consciousness in smokers.

**Impulsivity**

The variable of impulsivity has been studied with a great number of instruments with results being almost as varied as those reported in relation to antisocial tendencies. Eysenck (1963) studied 3000 British males, aged 45 to 64, using a questionnaire developed to study impulsiveness. He reported that the results indicated no relationship between this variable and smoking behavior. Jacobs and his associates (Jacobs et al., 1965, 1966) as well as Schubert (1965) also used special
questionnaires. These survey instruments were designed to measure impetuousness. The results of all three of these studies indicated a positive association between their measures of impetuousness and impulsivity. One of the questions that needs to be raised in comparing these four studies is whether the operational definitions of impulsivity are at all comparable. Secondly, differences among the samples or interactions among the instruments and other variables cannot be ruled out. In general, other studies reflect this contradiction and fail to contribute to establishing a definite direction to the relationship of this variable to smoking. Coan (1973) in a factor analytic approach to a smoking survey of 595 subjects reported that smokers favored spontaneity more than nonsmokers. Williams (1973) used a battery of tests including the Shybut Future Time Orientation Scale and the PRF with 386 high school students and reported a positive relationship of high impulsivity and low order with smoking behavior among boys but not among girls.

Results using the MMPI have also been mixed. Whiskin et al. (1962) failed to find a significant relationship between smoking and impulsivity using the Gough's Impulsivity Scale in their sample of 171 men (mean age was 70). However, a positive relationship between impulsivity and smoking was reported for their sample of 228 females. Dubitzky and Schwartz (1968) also reported no relationship between impulsivity and smoking using Block's Scale of Ego Control. Their comparison, however, was between light and heavy smokers and not between smokers and nonsmokers.

Finally, Lilienfeld (1959) and Lane et al. (1966) report a positive relationship between smoking behavior and impulsiveness when
measured by the NSA and G-Z respectively.

It appears that sex, measurement device, smoking levels and operational definitions of impulsivity are all confounded and conclusions are at best tenuous here. Although there appears to be more evidence for a positive than a negative relationship between smoking and impulsivity, more research is indicated.

Orality

One of the least studied variables in the area of smoking and personality is that of orality. Blacky Pictures were presented to heavy smokers and nonsmokers and the results indicated that smokers scored significantly higher on the factors of "oral craving" and "playfulness" than did nonsmokers (Kimeldorf & Geiwitz, 1966). Veldman and Brown (1969) reported results consistent with the stimulus-hunger theory of smoking motivation, having used scores based on one-word sentence completion responses. Jacobs and his associates (1965, 1966, 1970) in a series of studies have measured orality with a special questionnaire dealing with "non-nutritional oral intake activities." In three samples, significant relationships were found, including one in which 130 subjects were clinically interviewed after having completed the questionnaire previously. Comparison of the interviews and the questionnaire results indicated agreement as to the presence of oral preoccupation. In one sample of 97 adults no relationship between orality and smoking behavior was found (Jacobs et al., 1965). McDonald (1965) suggested that the results of his study, comparing first pregnancy nonmarried women smokers and nonsmokers using the MMPI, were more supportive of an oral indulgence theory of smoking than that of an anxiety reduction model. Due to the
lack of extensive research in this area, conclusions must be guarded, but it does appear that a positive relationship between orality and smoking may be expected.

Mental Health

The most diverse and confused area is that subsumed under the title of mental health. For the sake of discussion, a further breakdown of this section into six sub-sections has been undertaken. These subareas were constructed based on the construct being investigated or on the means of measuring a construct. The subareas are: emotional disturbance or stability; nervousness; personality integration; neuroticism; anxiety; and peer ratings of emotionality.

Emotional Disturbance or Stability. The first conglomerate of studies which deal with emotional disturbance or stability have reported inconsistent results. While Lawton and Phillips (1956) found a significant negative relationship between emotional stability and smoking behavior, Salber and Rochman (1964) using the MCI reported no relationship between the same factors in their sample of high school students. Likewise, Jacobs et al. (1965) using a special questionnaire for emotional lability, failed to find any association. In a later study, however, the same researchers (Jacobs et al., 1966) reported a positive relationship between emotional lability and smoking, using the same questionnaire. Lane et al. (1966) supported the relationship between emotional lability and smoking in a study of airman using the G-Z. Finally, McDonald (1965) noted a curvilinear relationship between smoking behavior and emotional lability in unmarried first pregnancy females using the MMPI.
**Nervousness.** The results of research using a variable described as "nervousness" have been much more enthusiastic in terms of finding a definite relationship. Studies using adults (Moodie, 1957) as well as medical students (Thomas, 1960) and college students (Coan, 1973) have all reported results which lend support to the relationship between nervousness and smoking behavior.

**Personality Integration.** Mixed findings are again the case when the more global factor of personality integration is studied. Three analyses in two studies (Heath, 1958; McArthur, Waldron, & Dickenson, 1958) resulted in two nonsignificant findings and one significant negative relationship. The negative relationship was obtained by McArthur and his associates using a physicians' prediction of college adjustment as the measurement device.

**Neuroticism.** No consensus of direction has been found using measures of neuroticism in relation to smoking behavior. While Lilienfeld (1959) and Kanekar and Dolke (1970) report significant negative associations based on the NSA and the Eysenck Personality Inventory (EPI) respectively, Eysenck (1960, 1963) failed to find any association after studying a total of 5360 British males with a questionnaire devised to measure neuroticism. Templer (1973) studied smokers and nonsmokers with the Death Anxiety Scale (DAS), which correlates positively with the neuroticism scale of the EPI, and found no difference between nonsmokers and smokers. Templer did report, however, a negative correlation ($r = -0.25$) between the DAS and the number of cigarettes smoked within the smokers group. Finally, Ryle (1962) using the Cornell Medical Index (CMI) reported a negative relationship in males but no relationship at all with females between indices of
neuroticism and smoking behavior.

**Anxiety.** Using the scores of the MMPI and other instruments as measurements of anxiety, researchers have generally been found to disagree as much as agree about the meaning of their results. Matarazzo and Saslow (1960) report results representative of this state of affairs. They found a negative relationship between anxiety and smoking behavior in college males and nursing students, and no relationship with a psychiatric population or college females. No relationship between smoking and anxiety indices was reported by Whiskin et al. (1962), Schubert (1959, 1965) and Jacobs et al. (1965) using the MMPI as a whole, the CPI, or groupings of MMPI scores.

On the other hand, some subscales of the MMPI do appear to have fostered some consistent findings. The hypomania scale (Ma) of the MMPI was found to be related significantly to smoking behavior by Schubert (1959, 1965), Cattell and Krug (1967) and Evans et al. (1967). Evans and his associates as well as Lane et al. (1966), however, found no support for this relationship using the 16PF anxiety scale. A series of studies by Schneider and Houston (1970, Houston & Schneider, 1973) utilizing the Taylor Manifest Anxiety Scale (MAS) with college students and later with mixed psychiatric patients, indicated that smokers as a group scored higher on this index of anxiety than the nonsmoking group. They report that there was no support for a significant relationship between the amount of smoking and the level of anxiety reported. Additionally, Coan (1973) noted that smokers reported, on a questionnaire, that they experience more distress in life than nonsmokers did. Raab and Krzyanck (1965) in their study of 200 professional men concluded that although smokers were generally more emotionally excitable than
nonsmokers, no clear relationship was demonstrable between smoking behavior and physical indices for anxiety such as cardiac sympathetic tone and adrenergic responses.

**Emotionality.** Peer ratings of emotionality have supported an inverse relationship between emotional adjustment and smoking in college students and nursing students (Smith, 1967), junior high school students (Smith, 1969a) and Puerto Rican high school students (Smith, 1969b). Smith (1969a) did not find support, however, for a relationship between peer ratings of emotionality and smoking in high school students. Smith has been the only investigator to use peer ratings in this area and thus consensual validity and reliability have not been assessed.

In general, it appears that in this broad area as in others, one of the problems becomes deciphering what is being measured from how it has been measured, and with whom? Thus, there seems to be a lack of construct validity, with regard to anxiety studies, owing partly to the proliferation of haphazard choices in terms of devices as well as ill-defined concepts. Despite this, the Ma scale of the MMPI and what can be generally described as nervousness or anxiety appear to be associated to some degree with smoking behavior, although this support is less than firm.

**Other Personality Variables**

Many other personality variables have been examined and related to smoking. Achievement and achievement motivation have been positively associated to smoking behavior when measured with the CPI (Carney, 1967). Simon and Primavera (1976), however, reported that smokers among 199 female undergraduates scored lower in achievement than nonsmokers.
These latter data seem to support the finding reported by Rabbins, Tanck and Meyersburg (1971) in which a high significant inverse relationship ($r = -0.45$) between grade point average and smoking levels is revealed. Friedman and Rosenman (1959) reported that men characterized by a hard-driving style of life smoked significantly more than men identified by an easy-going, relaxed style. The area of achievement and success appears to be confounded because of the numerous aspects and factors such as attitudes, intelligence and life-style which are involved in the measurement. Additionally, little research has been done in this area.

Vallance (1940) thought that nonsmokers would be more suggestible than smokers, and although no significant difference between the groups was detected, the results were in the predicted direction.

Koponen (1960) and Smith (1967) on the basis of the EPPS described the smoker as higher in expressed need for sex, aggression, achievement and dominance. Similarly, Simon and Primavera (1976), also using the EPPS, described the smokers as higher in needs for autonomy, heterosexuality, and change, but lower in needs for achievement, deference and order than nonsmokers. Weatherly (1965), however, failed to find any relationship between EPPS scores and smoking.

A series of studies by Jacobs and associates (1965, 1966, 1970, 1972) concluded that positive relationships existed between the factors of "attitude toward one's mother" and "danger seeking" and smoking behavior. Williams (1973) adds support to the relationship between danger seeking and smoking in a study of ninth graders.

Using the Rorschach projective test, McArthur et al. (1958) report that heavy smokers produced more coarctated responses than nonsmokers.
Thomas (1960) failed to replicate this finding in a study also utilizing the Rorschach.

Conclusions and Hypotheses

It appears from the available research that the following conclusions may be drawn with some support. First, smokers are more extraverted than nonsmokers. Secondly, smokers appear to exhibit greater antisocial tendencies than nonsmokers, but more research is needed to solidify this point. Another relationship which appears to have some support is that of impulsivity and smoking. Although the results are generally in the predicted direction, orality, as a personality factor in smokers has not been demonstrated to be firmly related to smoking behavior. While strong support is lacking, smokers may be more external in locus of control than nonsmokers. Finally, although the data from the mental health studies are confusing due to the wide variance in methodology as well as construct definition, it may be generalized that smokers are probably more anxious, nervous and hyperactive than nonsmokers. This generality is largely based on support lent by the relation of the Ma scale of the MMPI and the interpretation of that relationship based on the user's guide (Dahlstrom, Walsh, & Dahlstrom, 1960).

In summary then, the question of personality factors as determinants or as motivators to continue the smoking habit is a complex one. The literature seems to support the idea that smokers are more extraverted, external in their locus of control, impulsive, and nervous than nonsmokers. Additionally, smokers seem to exhibit more antisocial tendencies and oral cravings than nonsmokers.
The way in which these factors may interact is highly speculative at this point. If a smoker is more externally controlled than internally so, he would be much more open to the importance of fate and chance in his scheme of the world. As a result he may be more likely to be spontaneous, impulsive and reckless in attitude and action (as suggested by the studies discussed in the previous section). Following this life style, the impulsive and spontaneous smoker may find his actions and attitudes socially reprimanded, giving him the guise of a rebellious or antisocial type of person. This life style might also make him more aware of his external environment, especially in the sense that he has to deal with a "deviant" label in a social atmosphere. As such he may be more extraverted and thus interested in receiving reinforcement from his peers and external environment for his behavior. His feedback in terms of this role as an outwardly oriented and slightly impulsive person could bring about active restraint which would lead to frustration and anxiety, further reinforcing aggressive feelings and a high activity level. But where does smoking fit into this scheme? If we may accept, for the moment, the speculation presented above, smoking may be considered a functional component of the process. In one sense, smoking is a dangerous and life-threatening behavior. As such it helps to fulfill the requirements of the antisocial role. In another sense, anxiety and tension are often reported as uncomfortable states from which a cigarette offers relief. Finally, smoking is often a very social function as well as being a self-stimulating oral gratifier. Thus, smoking may fit in to such theoretical systems as the one provided in a multitude of ways, complicating the drawing of a specific function for smoking. In this sense, why a person smokes is indeed as complex a
question as why a person may drink.

What is more important than the speculation of how these factors fit together, is the use we put such data to. It may be more constructive to stay more concrete with the available data and use our research findings more pragmatically than speculatively. The utilization of specific treatment regimes or techniques and the preparation of individuals for treatment of smoking abuse could be greatly enhanced by matching personality characteristics with treatment methodology. A short example might suffice in making this point. If, for example, a smoker is found to be essentially within average limits on all of the personality traits examined with the exceptions of orality and impulsivity, it might behoove the therapist to be prepared to intervene if the subject begins to substitute eating for smoking and consequently decide to return to smoking because of the resultant weight gain. Such knowledge would be invaluable in constructing treatment schedules and programs to suit the individual.

But putting the speculation and star-gazing aside for the moment, and facing our present state of knowledge squarely, it becomes quite apparent that the study of personality and its relation to smoking behavior lacks comprehensiveness. What appears to be needed is a thorough study which encompasses the study of all six of the major areas in a well-established and comparative group. Further, the complex interactions among variables discussed before have not been explored to any great extent. The object of this study was to examine, therefore, the interrelationship among the six personality factors and their relationship with smoking behavior. The initial solution to these problems was to measure all six of the areas, at the same time, with the same population
and then analyze the results with multivariate techniques. Such a solution was attempted here.

The following hypotheses, based on the preceding literature are at the base of this research project. First, smokers are predicted to be more extraverted than non-smokers. Former smokers should be more similar to non-smokers and thus differ significantly from smokers. Second, smokers will be more externally oriented in their locus of control than non-smokers. Again, former smokers should be more closely aligned with non-smokers. Third, antisocial tendencies should be exhibited to a greater degree in smokers than non-smokers and former smokers. Fourth, smokers are predicted to be more impulsive than former smokers and non-smokers. Fifth, former smokers should score higher on indices of orality than non-smokers, but less than smokers. Finally, smokers should differ significantly from non-smokers on indices of nervousness and anxiety. Former smokers will be aligned between smokers and non-smokers on these measures.

In general, I predict smokers to score higher on all of the indices of the personality variables than former smokers. Former smokers, in turn, will score higher than non-smokers. The reasoning for this assumed central position of former smokers is based on the idea that those persons who have been able to extinguish smoking behavior have been able to either lessen the reinforcement factor of the cigarette in relation to their needs, or have become aware that their need is not as great as they had formerly decided. In either case, the strength or degree of the trait studied should be less in general than it is for those who have not been able to eliminate smoking behavior.
METHOD

Subjects

The subjects were 84 undergraduate psychology students taken from introductory psychology courses. The subjects were obtained through the subject pool sponsored by the Psychology Department. Credits were given to the participants in partial fulfillment of the requirements for their course. Six subjects were dropped because they made errors in filling out the testing questionnaire.

The subjects were placed in three groups based on their smoking history and current smoking level. The smoking group consisted of 23 males and 17 females who have been smoking five or more cigarettes per day on a regular basis. The 22 males and 13 males who reported that they had never smoked more than five cigarettes in one day and who were abstaining from cigarettes at the time of testing, were considered non-smokers. The nine former smokers, six males and three females, were persons who had previously smoked five or more cigarettes per day with some regularity, but reported at the time of testing that they were abstinent from cigarettes.

Materials

Two considerations were made in choosing the assessment devices. First, questionnaires and other devices which lacked definite norms, or had not been used in the smoking studies were avoided. This was done to reduce the apparent diversity in the field of study and to rely as strongly
as possible on standardized instruments. Results from standard measurement techniques should be more amenable to consistent interpretation than results obtained from other devices. Secondly, in an attempt to keep the testing at a minimum, as few as possible instruments were utilized.

The EPI was used to measure two variables. Specific scales of the EPI designed to measure extraversion and impulsivity (Eysenck & Eysenck, 1968, 1969) were utilized. Scales of the MMPI were also used to measure two variables. The psychopathic deviance scale (Pd) and the hypomania scale (Ma) were regarded as indices of antisocial tendencies or risk taking and mental health or manifest anxiety respectively. In order to be able to use standards established for the test (Dahlstrom et al., 1960), the K scale was also administered as a correction scale.

Locus of control was measured with the Rotter Internal-External Locus of Control Scale (Rotter, 1966). Finally, orality was scored on the basis of the Blacky Pictures (Blum, 1950). An objective scoring system established by Blum (1962) was applied to stories and multiple choice answers for the first two Blacky cards.

Procedure

All of the subjects were given two answer sheets. The first answer sheet (See Appendix A) was used to answer all of the items for all of the instruments except the Blacky Pictures. In addition, a smoking history was filled out, following the test items. The second answer sheet (See Appendix B) was used in reference to the Blacky Pictures. The subjects were asked to fill out all of the identifying information on these sheets and the smoking history before proceeding.

The subjects were then given the questionnaire booklet (Appendix
C). The experimenter went through all of the instructions with the subjects and answered any procedural questions at that time. The Blacky Pictures were administered first. The experimenter displayed the Blacky Pictures for all of the subjects and also allowed subjects to view the picture individually. The subjects were then told to follow the instructions in the question booklet.

The tests were administered in a small classroom to small groups of subjects. All of the subjects were informed as to the correct nature of this experiment and were assured that there was no deceptive technique involved. The subjects were also prompted to be "as honest as possible" by the experimenter. Additional questions by the subject as to more specific matters were handled on an individual basis following the testing. Testing time varied from 30 minutes to an hour. Individual subjects were assured of their anonymity in this study.

Following the data collection, all of the protocols were scored according to their respective procedures. The Blacky Pictures were scored blind by the author. Prior to scoring, reliability of the scoring procedure was established on ten test cases not utilized in this study. Reliability was found to be adequate ($r = .99$) between the principal investigator and another psychologist who was not informed as to the nature of the experiment. The rest of the questionnaire was scored by hand according to the respective standard methods. Analysis was done by computer.

Statistical Analysis

Three planned analyses were undertaken. The raw scores for each of the personality measures were converted to standard $z$-scores to allow
comparisons.

Following the z-score transformation a multivariate analysis of variance (MANOVA) was performed on the data (Wener, 1971). The second analysis was an analysis of variance (ANOVA) for repeated measures. In this analysis each personality variable score was considered a retest of the individual subject. It was hoped that a groups by trials interaction would emerge as significant.

Finally, a pattern analysis based on deviation scores (DeWolfe & Davis, 1972) was applied to the data. The deviation scores were constructed by calculating the mean of all the standard scores and substracting the mean scaled score from each subset scaled score. The mean of all the standard scores is derived from the individual subject's set of standard scores. These deviation scores have the characteristics of ipsative scores that give a person's relative position on different traits with reference to the individual's own overall mean.

One of the difficulties often encountered in doing research with normative data is the loss of individual patterns which may more easily be drawn from ipsative measures. Quoting DeWolfe and Davis (1972), "Group differences in overall performance may distort the relationship between the raw means of the elements" (p. 308). The analysis of deviation scores is independent of the group mean performance and yet applicable to comparison of normative group responding patterns.
RESULTS

Of the six hypotheses generated from the literature, two appear to be supported by the results of this investigation.

The raw score means for each of the three groups are presented in Table 2. As a group, smokers scored higher than former smokers and non-smokers on the extraversion and impulsivity measures. In all other categories, former smokers registered higher scores than smokers or nonsmokers. Table 3 represents the transposition of the raw scores into _z_-scores. The same pattern among the variables is also apparent. The lie scale scores (L) were included in the analyses. The L scores were taken from the EPI as a measure of response honesty. It is noteworthy that with the exception of some of the former smokers' scores, the standard deviations do not vary a great deal. The inconsistency of the former group may be accounted for by the small group size.

The multivariate F was not significant (F (14, 150) = 1.635, p < .076). This analysis points to the lack of support for an overall pattern of differences among these groups. The linear combination of the personality variables therefore, was not successful in discriminating the three groups. Table 4 gives the results of the analysis of variance for the seven variables and the univariate _F_-tests revealed two significant differences. Both the Ma scale and the Pd scale scores were significantly different among groups while extraversion scores approached significance.

The Ma scale differences indicate that nonsmokers scored
Table 2

Mean Raw Scores of Personality Variables

<table>
<thead>
<tr>
<th>Group</th>
<th>Ma</th>
<th>Pd</th>
<th>Locus of Control</th>
<th>Extraversion</th>
<th>Impulsivity</th>
<th>Orality</th>
<th>Lie</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smokers</td>
<td>24.6</td>
<td>24.0</td>
<td>11.0</td>
<td>13.9</td>
<td>4.5</td>
<td>3.2</td>
<td>2.3</td>
</tr>
<tr>
<td>Former Smokers</td>
<td>25.1</td>
<td>26.7</td>
<td>11.9</td>
<td>12.8</td>
<td>3.4</td>
<td>4.7</td>
<td>3.1</td>
</tr>
<tr>
<td>Nonsmokers</td>
<td>22.3</td>
<td>22.8</td>
<td>11.2</td>
<td>12.1</td>
<td>3.8</td>
<td>3.3</td>
<td>2.6</td>
</tr>
</tbody>
</table>
Table 3

Z-score Means and Standard Deviations for Personality Variables

<table>
<thead>
<tr>
<th>Personality Measures</th>
<th>Group</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Smokers</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>.22</td>
<td>.98</td>
<td>.05</td>
<td>.89</td>
<td>-.06</td>
<td>.97</td>
<td>.25</td>
<td>.96</td>
<td>.23</td>
<td>1.04</td>
<td>.11</td>
<td>.97</td>
<td>.14</td>
<td>1.02</td>
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<tr>
<td></td>
<td>Former</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Smokers</td>
<td>.33</td>
<td>.72</td>
<td>.72</td>
<td>.91</td>
<td>.22</td>
<td>1.02</td>
<td>-.08</td>
<td>.40</td>
<td>-.37</td>
<td>.77</td>
<td>.62</td>
<td>.83</td>
<td>.38</td>
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<tr>
<td></td>
<td></td>
<td>-.33</td>
<td>1.02</td>
<td>-.25</td>
<td>1.07</td>
<td>.01</td>
<td>1.06</td>
<td>-.26</td>
<td>1.10</td>
<td>-.16</td>
<td>.97</td>
<td>-.04</td>
<td>1.04</td>
<td>.07</td>
<td>.83</td>
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</table>
Table 4

Univariate F-tests on Z-scores for Personality Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ma</td>
<td>2, 81</td>
<td>3.376</td>
<td>3.587</td>
<td>.032</td>
</tr>
<tr>
<td>Pd</td>
<td>2, 81</td>
<td>3.165</td>
<td>3.689</td>
<td>.029</td>
</tr>
<tr>
<td>Extraversion</td>
<td>2, 81</td>
<td>2.518</td>
<td>2.518</td>
<td>.087</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>2, 81</td>
<td>0.284</td>
<td>0.279</td>
<td>.757</td>
</tr>
<tr>
<td>Impulsivity</td>
<td>2, 81</td>
<td>2.125</td>
<td>2.186</td>
<td>.119</td>
</tr>
<tr>
<td>Orality</td>
<td>2, 81</td>
<td>2.002</td>
<td>2.053</td>
<td>.135</td>
</tr>
<tr>
<td>Lie</td>
<td>2, 81</td>
<td>1.123</td>
<td>1.126</td>
<td>.329</td>
</tr>
</tbody>
</table>
significantly lower on this index of anxiety than smokers or former smokers. This finding offers partial support for the sixth hypothesis. While the nonsmokers were least anxious, former smokers were not aligned between smokers and nonsmokers on the pattern of anxiety scores. Contrary to prediction, former smokers were actually the highest scoring group on this variable, and resembled smokers more than nonsmokers.

The second significant difference among the Pd scores of the groups is also partially supportive of one of the experimental hypotheses. Nonsmokers were significantly less likely to be risk-takers or exhibit antisocial tendencies than former smokers and smokers. Former smokers were, however, the most likely as a group, to be risk-taking individuals; but in this case, smokers and nonsmokers were more similar to each other than former smokers were to either of the other two groups.

The rest of the F-tests reported in Table 4 do not lend support for the remaining four hypotheses of this study. No significant differences between the groups were detected on the measures of extraversion, locus of control, orality or impulsivity. In addition, the L scores did not discriminate among the groups. This last finding seems to support a conclusion that the groups answered the questionnaire scales with the same degree of truth.

The results of the repeated measures ANOVA are reported in Table 5. While there were no significant main effects for sex, group, or measures, a significant interaction of groups by measures was found. This significant interaction is especially noteworthy, in that from such a result one finds some support for the contention there are some differences between the groups on at least one variable. Since sex and the sex by measures interaction were not significant, the decision to
### Table 5

**ANOVA for Repeated Measures on Z-scores**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>2</td>
<td>6.84</td>
<td>3.42</td>
<td>2.19</td>
<td>.119</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>1.08</td>
<td>1.08</td>
<td>0.69</td>
<td>.409</td>
</tr>
<tr>
<td>Group X Sex</td>
<td>2</td>
<td>2.73</td>
<td>1.36</td>
<td>0.86</td>
<td>.421</td>
</tr>
<tr>
<td>Subjects (Error)</td>
<td>78</td>
<td>121.70</td>
<td>1.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measures</td>
<td>6</td>
<td>4.04</td>
<td>0.67</td>
<td>0.78</td>
<td>.582</td>
</tr>
<tr>
<td>Group X Measures</td>
<td>12</td>
<td>20.29</td>
<td>1.69</td>
<td>1.97</td>
<td>.025</td>
</tr>
<tr>
<td>Sex X Measures</td>
<td>6</td>
<td>4.60</td>
<td>0.76</td>
<td>0.89</td>
<td>.498</td>
</tr>
<tr>
<td>Group X Sex X Measures</td>
<td>12</td>
<td>11.18</td>
<td>0.93</td>
<td>1.09</td>
<td>.369</td>
</tr>
<tr>
<td>Subjects X Measures (Error)</td>
<td>468</td>
<td>401.40</td>
<td>0.86</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
combine the sexes within the groups for the other analyses was supported.

In order to analyze the groups from a more ipsative approach, a pattern analysis was performed on deviation scores. It was hoped that individual patterns of response by the members of the different groups would discriminate those groups.

Table 6 summarizes the means and standard deviations for the difference scores used in the pattern analysis. Univariate ANOVA's performed on these variables are summarized in Table 7. The only variable reaching significance was that of impulsivity. Former smokers did not differ from smokers or nonsmokers based on their absolute level of impulsivity. However, in terms of their individual patterns of scores on the seven measures used in this study, impulsivity was the lowest score for the former smoker group. Contrary to prediction, smokers and nonsmokers were similar to each other. For the individuals in these two groups, impulsivity scores were at about the same level as the individual's own overall mean level of responding. This was in contrast to and significantly different from the former smokers' patterns for whom impulsivity was their lowest score relative to their overall mean performance on all of the variables.

In summary, the hypotheses with regard to anxiety and psychopathic deviance or risk-taking were partially supported. Although nonsmokers were the group reporting the least anxiety and risk-taking tendencies, former smokers and smokers were more alike than dislike each other on anxiety measures and former smokers scoring highest on both measures. Contrary to prediction smokers were not more extraverted, more externally oriented, more impulsive, or exhibitive of greater oral needs than former smokers and nonsmokers. In direct contradiction to one hypothesis,
Table 6

Difference Score Means and Standard Deviations for Personality Variables

<table>
<thead>
<tr>
<th>Group</th>
<th>Ma</th>
<th>Pd</th>
<th>Locus of Control</th>
<th>Extraversion</th>
<th>Impulsivity</th>
<th>Orality</th>
<th>Lie</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smokers</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Former Smokers</td>
<td>M</td>
<td>.154</td>
<td>-.009</td>
<td>-.118</td>
<td>.194</td>
<td>-.170</td>
<td>-.205</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>.828</td>
<td>.767</td>
<td>.757</td>
<td>.801</td>
<td>.966</td>
<td>1.088</td>
</tr>
<tr>
<td>Non-smokers</td>
<td>M</td>
<td>-.195</td>
<td>-.109</td>
<td>.145</td>
<td>.122</td>
<td>-.026</td>
<td>.102</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>.852</td>
<td>.858</td>
<td>.988</td>
<td>.808</td>
<td>.675</td>
<td>.949</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 7

Univariate F-tests on Difference Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>MS</th>
<th>F</th>
<th>p less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ma</td>
<td>1.161</td>
<td>1.729</td>
<td>0.184</td>
</tr>
<tr>
<td>Pd</td>
<td>1.163</td>
<td>1.732</td>
<td>0.183</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>0.653</td>
<td>0.867</td>
<td>0.424</td>
</tr>
<tr>
<td>Extraversion</td>
<td>1.459</td>
<td>2.418</td>
<td>0.096</td>
</tr>
<tr>
<td>Impulsivity</td>
<td>2.350</td>
<td>4.161</td>
<td>0.019</td>
</tr>
<tr>
<td>Orality</td>
<td>1.351</td>
<td>1.548</td>
<td>0.219</td>
</tr>
<tr>
<td>Lie Scale</td>
<td>1.641</td>
<td>1.435</td>
<td>0.244</td>
</tr>
</tbody>
</table>
former smokers were the least impulsive group while smokers and non-smokers were more alike on the indice of impulsivity than expected.
DISCUSSION

The purpose of this study was to investigate the relationship of personality variables and smoking behavior. While it was predicted that there would be support for positive relationships between all six of the variables under examination and level of smoking only partial support was found on three variables.

First, it is most surprising that extraversion was not a significantly discriminating variable despite strong support in the literature to the contrary. One of the possible explanations is that a type of ceiling effect had occurred. The mean scores of the former smokers (lowest group) ranked above the 68th percentile while smokers scored at nearly the 84th percentile (Eysenck & Eysenck, 1968), based on samples of British males. More recent research (Eysenck & Eysenck, 1975) has indicated that elevated scores on extraversion are expected among college-aged individuals. It may be that because the college population is generally more extraverted, differences among groups were minimized. This skewing of scores suggests that further research be pursued using a different population or using an instrument less sensitive to age differences.

The predicted positive relationship between external locus of control and smoking was not found. It appears that the most parsimonious conclusion is that there is no consistent relationship between external locus of control and smoking behavior. Since college students as a whole score higher on external locus of control than other adults (Joe, 40
1971; Rotter, 1966), the consistent overall elevation of scores for all three groups is not unexpected. The magnitude of the elevation, however, exceeds one standard deviation regardless of the normative group used (Rotter, 1966). As a result, a ceiling effect may have been operating to mask any "real" group differences. One plausible explanation for this elevation is the political climate at the time of testing. Joe (1971) presents numerous studies which indicate that there is a strong political factor in the I-E scale. On the other hand, the lack of strong support in the literature for a definite relationship between locus of control and smoking argues for the weakness of this variable with regard to cigarette smoking.

The significant difference found among groups on the measure of psychopathic deviance is also somewhat confusing in that former smokers were the highest scoring group. The range of scores would lend itself to the interpretation that this population was independent-minded or at least mildly nonconformist in orientation (Dahlstrom et al., 1968). One plausible explanation for this finding is that former smokers may be more willing as a group to divorce themselves from group pressures and make an active decision to quit smoking. The response bias suggested by some authors (Matarazzo & Saslow, 1960; Weatherly, 1965) in regard to acknowledgment of antisocial or risk-taking tendencies is not supported since there were no significant differences among groups on the L scale scores.

Since the deviant group was represented by only nine cases and since there is a strong similarity between smokers and nonsmokers on this measure of risk-taking tendencies, the question of an artifactual result generated by sample size differences is raised.
Considerable caution is required in making any strong conclusions and further research appears to be appropriate.

Impulsivity as a personality variable is related to smoking behavior in general agreement with the experimental prediction. When general level of functioning is considered, nonsmokers are less impulsive than smokers. The surprising result is that former smokers are by far the least impulsive of the three groups. While this finding could be considered consistent with the hypothesis that those individuals who are least impulsive are most likely to be able to effectively extinguish smoking behavior, caution should again be exercised in drawing conclusions. The possibility of artifactual finding because of the small sample size in the former smoking group needs to be considered. It is also somewhat confusing to find the least impulsive group as also exhibiting the highest risk-taking behavior. Although risk-taking can be considered as calculated as opposed to impulsive action, confidence in these results is of a questionable degree. More optimistically, however, we might interpret these results to indicate that former smokers are independent and deliberate individuals capable of making hard decisions and maintaining good self control to put these decisions into action. It seems reasonable to test these hypotheses in further research. Such additional research could be particularly valuable since a better understanding of former smokers could aid in predicting who may profit most from programs designed to help people stop smoking.

While orality, like locus of control, was not supported strongly in the literature as having a positive relationship to smoking, it is noteworthy that the findings reported by Jacobs and his associates (1965, 1966, 1970) were not collaborated. Orality should not be totally
discounted as a variable because of the difficulty in finding reliable and valid instruments to measure the concept. In this case, however, little support is given to the factor of orality in the determination of smoking behavior.

Although the three groups were dissimilar on the variable of anxiety and mental health, its relationship to smoking behavior is difficult to explain. While nonsmokers were found to be the least anxious of the groups as expected, former smokers scored higher on anxiety than smokers. Concern for health and the subsequent anxiety increase in sensitive individuals would be consistent to interpretations presented for former smokers in regard to risk-taking tendencies and impulsivity. The data does not lend itself to deciphering antecedent from consequent states unfortunately. That is, it is not clear as to whether more anxious or anxiety sensitive individuals are more likely to stop smoking or if those who stop smoking become more anxious as a result. A longitudinal study would be most appropriate in attempting to answer this question.

As has been stated before, some caution must be exercised in making interpretations from the present data. The population under study is highly specific making broad generalizations inappropriate. Additionally, sample sizes, particularly in the case of former smokers, were small.

In general, there is support for the basic premise that personality variables are related to smoking status among college students. This study also indicates that more research, especially replication studies, are necessary to answer some of the questions in this area of investigation. Finally, it is concluded that obtaining useful measurement devices is still a major source of difficulty in doing research with
personality variables in relation to cigarette smoking.

Some hypotheses may also be generated relative to the implications that the findings have for therapeutic intervention. People most likely to be successful in terminating their smoking habit are less impulsive, more independent and less sensitive to the influence of others. They may also be more likely to be anxious and sensitive to their own needs. For successful outcomes it is therefore suggested that intervention be made as soon as possible to the point of decision to stop smoking. At this point of decision, anxiety would be high and contingency management might be used to sway the individual into making a commitment. Secondly, the use of internal contingency models to sustain abstinence would seem likely to be most effective. Increased therapeutic effectiveness might be accomplished by allowing the individual to capitalize on his self-control and independence rather than by pressuring his decision or making abstinence contingent on external rewards.

While there was some evidence of a relationship of personality variables to smoking behavior found in this study, on an absolute scale of usefulness, little profit toward understanding smoking behavior or helping smokers to stop smoking was gained. It may be that personality as defined in current assessment techniques is not the most promising way to understand the complex variables involved in smoking.

The clinician may need more training in learning and feedback principles, operational understanding of the impact of the situation over and above the factor of personality, and a willingness to put personality theory as it is presently conceived in a different perspective, if an effective assault on the behavioral disorder of cigarette smoking is to be waged.


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Veldman, D. J., & Brown, O. H. Personality and performance characteristics


APPENDIX A
ANSWER SHEET

NAME _______________________________ SEX M F ____________________________

CLASS—INSTRUCTOR ____________________________

INSTRUCTIONS: Put an X through the answer that you wish to give to the questions in
the booklet. On questions 1 to 29 choose either A or B. For the
rest of the questions mark either T for true or F for false. Any
answer which is affirmative should be marked T, those negative, F.
PLEASE!! Make NO MARKS IN THE BOOKLET. Try to answer all of the
questions, leaving no blanks.

6. A B 54. T F 102. T F 150. T F
7. A B 55. T F 103. T F 151. T F
8. A B 56. T F 104. T F 152. T F
12. A B 60. T F 108. T F 156. T F
15. A B 63. T F 111. T F 159. T F
16. A B 64. T F 112. T F 160. T F
22. A B 70. T F 118. T F 166. T F
25. A B 73. T F 121. T F 169. T F
27. A B 75. T F 123. T F 171. T F
31. T F 79. T F 127. T F 175. T F
32. T F 80. T F 128. T F 176. T F
33. T F 81. T F 129. T F 177. T F
34. T F 82. T F 130. T F 178. T F
35. T F 83. T F 131. T F 179. T F
36. T F 84. T F 132. T F 180. T F
37. T F 85. T F 133. T F 181. T F
38. T F 86. T F 134. T F 182. T F
40. T F 88. T F 136. T F 184. T F
41. T F 89. T F 137. T F 185. T F
42. T F 90. T F 138. T F 186. T F
43. T F 91. T F 139. T F 187. T F
44. T F 92. T F 140. T F 188. T F
45. T F 93. T F 141. T F 189. T F
46. T F 94. T F 142. T F 190. T F
47. T F 95. T F 143. T F 191. T F
48. T F 96. T F 144. T F 192. T F

Please Fill out Below:

Average number of cigarettes smoked per day __________

Have you ever tried to quit? Yes ___ No ___

Number of times __________

If you have stopped smoking, how long have you been without a cigarette? __________

How much did you smoke before? __________

DO NOT WRITE IN THIS SPACE
Name ___________________ PICTURE ANSWER SHEET ___________________ Instructor ___________________

CARTOON I  Here is Blacky with Mama...

Record your story here.................................................................
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.................................................................................................
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.................................................................................................
.................................................................................................

Circle Your Choice for the Questions:

1. A  B  C
2. A  B  C
3. A  B  C
4. A  B  C
5. A  B  C
6. A  B  C

CARTOON II  Here is Blacky with Mama's collar...

Record your story here.................................................................
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.................................................................................................
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Circle Your Choice for the Questions:

1. A  B  C
2. A  B  C
3. A  B  C
4. A  B  C
5. A  B  C
6. A  B  C
APPENDIX C
GENERAL INSTRUCTIONS: Please make No Marks in this booklet. You have been supplied with two (2) answer sheets for recording all of your answers. Try to answer all questions, leaving no blanks. Follow the instructions, and work quickly. Wait for the experimenter to explain the procedure before starting. You will NOT be timed. There are no right or wrong answers to these questions, so please try to be honest in your responses. Answer the questions as you really feel. If you have any questions raise your hand and the experimenter will answer them for you. Now please wait for instructions before opening this booklet.
Picture Instructions:
You will be shown two cartoons, like those that you see in the funny papers, except that there are no words. The idea is for you to make up a little story for each one—just tell what is happening in the picture, why it is happening, and so on. Since this is sort of a test of how good your imagination can be, try to tell as much as possible about how the characters feel. When you are done writing this short story, answer the questions for each cartoon. There are no right or wrong answers for these questions—I'm just interested in what you imagine the answers to be. MAKE NO Marks ON THIS SHEET.

QUESTIONS for CARTOON I:
1. Is Blacky
   a. happy?
   b. unhappy?
   c. or doesn't feel one way or the other.

2. How does Mama feel in this scene?
   a. Very contented.
   b. Pleased but tired.
   c. Rather unhappy.

3. Which would Blacky rather do?
   a. Stay until the feeding is over and then go someplace else.
   b. Stay as long as possible and be sure to get enough nourishment.

4. Which one of the following best describes Blacky?
   a. A little glutton who never stops eating.
   b. Someone with a hearty appetite which usually gets satisfied.
   c. Someone who sometimes doesn't get enough to replace all the energy he/she burns up.

5. Judging by appearances, how much longer will Blacky want to be nursed by Mama before being weaned?
   a. Will want to be on his/her own fairly soon.
   b. Will want to continue to be nursed until a bit older.
   c. Feels Mama would like to turn him/her loose right now.

6. How will Blacky feel about eating when he/she grows older?
   a. Will rather eat than do most anything else.
   b. Will enjoy eating but will like lots of other things just as much.
   c. Will never get enough to satisfy his/her appetite.

QUESTIONS for CARTOON II:
1. Why is Blacky doing that to Mama's collar?
   (fill in short answer on sheet)

2. How often does Blacky feel like acting up this way?
   a. Once in a while.
   b. Fairly often.
   c. Very often.

3. Blacky most often acts like this when he/she can't get enough of which of the following?
   a. Attention.
   b. Milk.
   c. Recreation.

4. What will Blacky do next with Mama's collar?
   a. Got tired of it and leave it on the ground.
   b. Return it to Mama.
   c. Angrily chew it to shreds.

5. If Mama comes on the scene, what will she do?
   a. Feed Blacky again.
   b. Send Blacky off to bed without dinner.
   c. Bark.

6. What would Blacky do if Mama did come over to feed him/her?
   a. Ignore Mama and continue chewing the collar.
   b. Put down the collar and start eating.
   c. Try to get even with Mama by trying to bite her instead of the collar.
INSTRUCTIONS: For each number in the following section, pick the alternate (a or b) which is closest to your viewpoint. Always choose whichever is closest to your own opinion even when the choice is difficult. Record your choice on the answer sheet. DO NOT write in this booklet. TRY TO LEAVE NO BLANKS.

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 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 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 just as well decide what to do by flipping a coin.
16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
   b. Getting people to do the right thing depends upon ability; luck has little or nothing to do with it.

17. a. As far as world affairs are concerned, most of us are 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 is really 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 a direct connection between how hard I study and the grades I get (or got).

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.

In the following Section follow these instructions listed below:

ALL of the remaining questions should be answered true (T) or false (F). If the answer is true or mostly true of yourself, mark T on the answer sheet. If the answer to the question is false or mostly not true of yourself, mark F on the answer sheet. Please be as honest as you can. TRY TO LEAVE NO BLANKS.
If your answer to the question is YES mark T; if NO mark F; on the answer sheet.

30. Do you often long for excitement?
31. Do you often need understanding friends to cheer you up?
32. Are you usually carefree?
33. Do you find it hard to take no for an answer?
34. Do you stop and think things over before doing anything?
35. If you say you will do something do you always keep your promise no matter how inconvenient it might be to do so?
36. Does your mood often go up and down?
37. Do you generally do and say things quickly without stopping to think?
38. Do you ever feel "just miserable" for no good reason?
39. Would you do almost anything for a dare?
40. Do you suddenly feel shy when you want to talk to an attractive stranger?
41. Once in a while do you lose your temper and get angry?
42. Do you often do things on the spur of the moment?
43. Do you often worry about things you should not have done or said?
44. Generally do you prefer reading to meeting people?
45. Are your feelings rather easily hurt?
46. Do you like going out a lot?
47. Do you occasionally have thoughts and ideas you would not like other people to know about?
48. Are you sometimes bubbling over with energy and sometimes very sluggish?
49. Do you prefer to have few but special friends?
50. Do you daydream a lot?
51. When people shout at you, do you shout back?
52. Are you often troubled about feelings of guilt?
53. Are all your habits good and desirable ones?
54. Can you usually let yourself go and enjoy yourself a lot at a party?
55. Would you call yourself tense or high-strung?
56. Do other people think of you as being very lively?
57. After you have done something important, do you often come away feeling you could have done better?
58. Are you mostly quiet when you are with other people?
59. Do you sometimes gossip?
60. Do ideas run through your head so that you cannot sleep?
61. If there is something you want to know about, would you rather look it up in a book than talk to someone about it?
62. Do you get palpitations or thumping in your heart?
63. Do you like the kind of work that you need to pay close attention to?
64. Do you get attacks of shaking or trembling?
65. Would you always declare everything at the customs even if you knew that you could never be found out?
66. Do you hate being in a crowd who play jokes on one another?
67. Are you an irritable person?
68. Do you like doing things in which you have to act quickly?
69. Do you worry about awful things that might happen?
70. Are you slow and unhurried in the way you move?
71. Have you ever been late for an appointment or work?
72. Do you have many nightmares?
73. Do you like talking to people so much that you would never miss a chance of talking to a stranger?
74. Are you troubled by aches and pains?
75. Would you be "very unhappy if you could not see lots of people most of the time?"
76. Would you call yourself a nervous person?
77. Of all the people you know are there some whom you definitely do not like?
78. Would you say you were fairly self-confident?
79. Are you easily hurt when people find fault with your work?
80. Do you find it hard to really enjoy yourself at a lively party?
81. Are you troubled by feelings of inferiority?
82. Can you easily get some life into a rather dull party?
83. Do you sometimes talk about things you know nothing about?
84. Do you worry about your health?
85. Do you like playing pranks on others?
86. Do you suffer from sleeplessness?
87. My daily life is full of things that keep me interested.
88. A person should try to understand his dreams and be guided by or take warning from them.

89. I work under a great deal of tension.
90. I am sure I get a raw deal from life.
91. My sex life is satisfactory.
92. At times I have very much wanted to leave home.
93. At times I have fits of laughing and crying that I cannot control.
94. No one seems to understand me.
95. At times I feel like swearing.
96. I find it hard to keep my mind on a task or job.
97. I have had very peculiar and strange experiences.
98. If people had not had it in for me I would have been much more successful.
99. I have never been in trouble because of my sex behavior.

100. During one period when I was younger, I engaged in petty thievery.
101. At times I feel like smashing things.
102. My family does not like the work I have chosen (or the work I intend to choose for my life work).
103. I have often had to take orders from someone who did not know as much as I did.
104. I have not lived the right kind of life.
105. I sometimes keep on at a thing until others lose their patience with me.
106. I wish I could be as happy as others seem to be.
107. I think a great many people exaggerate their misfortunes in order to gain the sympathy and help of others.
108. I am an important person.
109. I am easily downed in an argument.
110. These days I find it hard not to give up hope of amounting to something.
111. It takes a lot of argument to convince most people of the truth.
112. I do not mind being made fun of.
113. I do many things that I regret afterwards (I regret things more or more often than others seem to).

114. I have very few quarrels with members of my family.
115. At times I have a strong urge to do something harmful or shocking.
116. I have met problems so full of possibilities that I have been unable to make up my mind about them.
117. I believe that women should have as much sexual freedom as men.
118. My hardest battles are with myself.
119. Sometimes when I am not feeling well I am cross.
120. I am happy most of the time.
121. Some people are so bossy that I feel like doing the opposite of what they request, even though I know that they are right.
122. Someone has it in for me.
123. I have never done anything dangerous for the thrill of it.
124. In school I was sometimes sent to the principal for cutting up.
125. My speech is the same as always (not faster or slower, or slurring; no hoarseness).
126. My table manners are not quite as good at home as when I am out in company.
127. Most people will use somewhat unfair means to gain profit or an advantage rather than to lose it.
128. I know who is responsible for most of my troubles.
129. Often I can't understand why I have been so cross and grouchy.
130. At times my thoughts have raced ahead faster than I could speak them.
131. I believe that my home life is pleasant as that of most people I know.
132. Criticism or scolding hurts me terribly.
133. My conduct is largely controlled by the customs of those about me.

134. I certainly feel useless at times.

135. When I was a child, I belonged to a crowd or gang that tried to stick together through thick and thin.

136. It makes me impatient to have people ask my advice or otherwise interrupt me when I am working on something important.

137. I am neither gaining or losing weight.

138. I have had periods in which I carried on activities without knowing later what I had been doing.

139. I feel that I have often been punished without cause.

140. I have never felt better in my life than I do now.

141. I am afraid when I look down from a high place.

142. It wouldn't make me nervous if any members of my family got into trouble with the law.

143. What others think of me does not bother me.

144. I liked school.

145. I find it hard to make talk when I meet new people.

146. I have been inspired to a program of life based on duty which I have since carefully followed.

147. I am against giving money to beggars.

148. I have had attacks in which I could not control my movements or speech but in which I knew what was going on around me.

149. I wish I were not so shy.

150. My people treat me more like a child than a grow-up.

151. I have used alcohol excessively.

152. There is very little love and companionship in my family as compared to other homes.

153. I frequently find myself worrying about something.

154. It is not hard for me to ask help from my friends even though I cannot return the favor.

155. My parents have often objected to the kind of people I went around with.

156. Some of my family have habits that bother and annoy me very much.

157. At times I feel that I can make up my mind with unusually great ease.

158. I like to talk about sex.

159. I have been inspired to a program of life based on duty which I have since carefully followed.

160. I have at times stood in the way of people who were trying to do something, not because it amounted to much but because of the principle of the thing.

161. I get mad easily and then get over it soon.

162. I have been quite independent and free from family rule.

163. I brood a great deal.

164. My relatives are nearly all in sympathy with me.

165. I have periods of such restlessness that I cannot sit long in a chair.

166. I have been disappointed in love.

167. I never worry about my looks.

168. My way of doing things is apt to be misunderstood by others.

169. My parents and family find more fault with me than they should.

170. Sometimes without any reason or even when things are going wrong I feel excitedly happy, "on top of the world."

171. I don't blame anyone for trying to grab everything he can get in this world.

172. I have had blank spells in which my activities were interrupted and I did not know what was going on around me.

173. I sweat very easily even on cool days.

174. Once a week or oftener I become very excited.

175. When in a group of people I have trouble thinking of the right things to talk about.

176. Something exciting will almost always pull me out of it when I am feeling low.

177. I do not blame a person for taking advantage of someone who lays himself open to it.

178. At times I am full of energy.

179. I drink an unusually large amount of water every day.

180. At times I have been so entertained by the cleverness of a crook that I have hoped he would get by with it.
181. I am sure I am being talked about.
182. I have very few fears as compared to my friends.
183. I am always disgusted with the law when a criminal is freed through the arguments of a smart lawyer.
184. I have never been in trouble with the law.
185. I have periods in which I feel unusually cheerful without any special reason.
186. If several people find themselves in trouble, the best thing for them to do is to agree upon a story and stick to it.
187. I think nearly everyone would tell a lie to keep out of trouble.
188. I worry over money and business.
189. At periods my mind seems to work more slowly than usual.
190. People often disappoint me.
191. I have sometimes felt that difficulties were piling up so high that I could not overcome them.
192. I have often met people who were supposed to be experts who were no better than I.
193. I find it hard to set aside a task that I have undertaken, even for a short time.
194. I like to let people know where I stand on things.
195. Much of the time I feel I have done something wrong or evil.
196. It makes me uncomfortable to put on a stunt at a party even when others are doing the same sort of thing.
197. I often think, "I wish I were a child again."

STOP
The thesis submitted by Dale A. Bespalec has been read and approved by the following Committee:

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

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

[Signature]
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