A COMPARISON OF CERTAIN RORSCHACH INDICES
BETWEEN SMOKERS AND NONSMOKERS

THESIS

Presented to the Graduate Council of the
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Fulfillment of the Requirements

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MASTER OF ARTS

By

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The purpose of this study was to compare a group of college smokers with a similar group of college nonsmokers on eleven Rorschach indices. The sources of data were thirty-five smokers and thirty-five nonsmokers enrolled in Introductory English courses at Texas Christian University during the 1971-1972 academic year.

Chapter I of this study includes a statement of the problem, need for the study, statement of the hypotheses, definition of terms, and the manner in which the data will be treated.

Chapter II is devoted to a survey of literature pertinent to this study. After examining available research evidence, it was determined that only from a systematic and theoretical approach can there be developed testable hypotheses that will contribute to a greater understanding of the relationship between the personality dynamics of smokers and nonsmokers.

In Chapter III, the raw data were treated for measures of central tendency and variability in order to determine levels of significant differences. Hotelling's $T^2$ was employed as an overall test of within-subjects effects.
The resulting Hotelling's $T^2$ of 43.391 was significant at the .001 confidence level, thus permitting rejection of the null hypothesis, and warranting further statistical treatment of the data by Fisher's $t$. The four indices which may be of further value in differentiating between smokers and nonsmokers are (1) $W$ per cent, (2) $Dd$ per cent, (3) $FC$ per cent, and (4) $P$ per cent.

In terms of behavioral implications, it might be assumed that the smoker will have a tendency to apply his intelligence in a minute, detailed, scientific manner, with a lowered drive for seeking relationships between presented fact and environmental experience. In addition, the smoker will tend to be more socially oriented than the nonsmoker.

Chapter IV, which contains a summary of the study and conclusions, cautions against generalizing the results beyond the college-student population without the benefit of further research, and offers three recommendations for further research in this area. These recommendations are (1) utilization of more intensive sampling procedures, (2) considering the use of a different method of statistical analysis to eliminate the confounding effect of the variability of the total number of responses, and (3) broadening the scope of the study by the examination of a greater number of Rorschach variables.
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CHAPTER I

INTRODUCTION

In recent years, there has been growing concern over the possible deleterious effects of smoking upon the human body. If smoking is such a menace to health, there is a need for continued research to determine why some individuals persist in smoking and others refrain from this habit. While this may be true, there has been very little research reported concerning the personality characteristics of smokers versus nonsmokers. If there are significant personality differences between smokers and nonsmokers, these should be investigated.

Smoking, in the most general sense, is a form of behavior, and while there is little agreement among personality theorists concerning the question of behavioral causation, there is a consensus of opinion as related to the fact that all behavior is caused by the organism. Snygg and Combs state that "all behavior, without exception, is completely determined by and pertinent to the phenomenal field of the organism" (4, p. 36).

In listing their basic assumptions of a dynamic theory of personality, Mowrer and Kluckholn note that "The behavior of all living organisms is always functional" (2, p. 11).
The implication is that the way in which a person reacts to his environment and the ways in which he selects to satisfy his needs can best be seen as learned ways of easing tensions. Symonds points out that

For one who would understand personality, there is nothing more important than insight into the inner forces which drive him to action. The argument of this book is based on the hypothesis that all behavior originates in response to urges within an individual (3, p. 53).

On the basis of the preceding studies, it seems reasonable to assume that smoking may be viewed as a method of satisfying inner needs, thereby reducing tension. If smoking does reduce tension, it may therefore serve as a defense mechanism, i.e., to soften failures, protect from anxiety, and maintain personal feelings of worth and self adequacy.

Statement of the Problem

The purpose of this study is to determine if smokers differ significantly from nonsmokers in personality structure, as measured by the Rorschach Psychodiagnostic Technique.

Need for the Study

The present study investigated the significant levels of difference existing between smokers and nonsmokers as determined by certain Rorschach indices. The survey of literature reveals a paucity of conclusive and definitive research as to the reason why individuals do or do not
acquire the smoking habit. The Rorschach Psychodiagnostic Technique presents the subject with an ambiguous, unstructured situation, characterized by less opportunity to manipulate and repress ideational processes, thereby resulting in a more reliable picture of the subject's personality structure. It is the intent of this research to add to the field of knowledge relating to individual differences in personality structure and dynamics.

Hypothesis

This study investigated the hypothesis that there is no significant difference between smokers and nonsmokers on certain Rorschach scoring indices.

Definition of Terms

The Rorschach Psychodiagnostic Test consists of ten cards containing ambiguous, unstructured ink blots: five cards are chromatic, five are achromatic. The following are definitions of scoring indices based upon Beck's definitions of the following indices relative to the present study:

1. Whole Per Cent (W%)--This factor refers to the percentage of responses which involve the usage of the whole card. To produce a "W" requires greater psychic strength and creative imagination than to produce a response using less than the whole card. "W" responses are generally regarded as a measure of the person's capacity
to rationalize, take the entire situation into account, and think in a theoretical manner. They may be produced because the subject can easily organize and fit intricate parts into whole relationships, or because of his inability to see or organize the parts. Good organization indicates the height of intelligence, indicative of lack of constriction and doubt contraindicating uncertainty or depression. An over-abundance of these responses, however, is indicative of compulsiveness.

2. Detail Per Cent (D%)--Beck (1, p. 24) says that "the majority of the 'D' responses are readily identified. They relate to certain portions in each ink blot figure that most prominently attract attention to themselves; in consequence they are the most commonly selected." Emphasis on "D" reveals a common-sense approach to a situation with attention to the obvious. In certain cases, especially in the absence of neurotic shock and with mediocre "F," "D" is a function of intelligence. A great number of "D" responses is suggestive of conformity, or rigid, guarded procedure. It may mean that the subject refuses to reveal self or thoughts, by giving only the most common and easily seen responses.

3. Rare Detail Per Cent (Dd%)--These responses are made to certain parts of the card, not responded to with as great a frequency as "D" responses. While the majority of responses scored as "Dd" are smaller than those scored
as "D," according to Beck, size, position, and space rhythm play roles of varying importance (1, p. 28). If there are no emotional difficulties, persons with a large "Dd%" tend to attack problems in a minute, detailed, scientific manner. "Dd" responses may show emotional blocking when the person is so depressed that he is without drive. In extreme cases, inability to distinguish between important and irrelevant issues is responsible for "Dd" production. Schizophrenics and subjects with limited intelligence frequently produce high "Dd" totals.

4. **Form Per Cent (F%)**--Responses which are determined by the form or shape of the ink blot are scored "F." It is one of the key determinants in a record, denoting control and intellectual stabilization. In a typical protocol, it should not exceed 50 per cent. More than 50 per cent indicates undue constriction, and almost invariably is a sign of maladjustment of some phase of the personality.

5. **Good Form Per Cent (F+%)**--The "F+%" is a revealing test factor through which an individual shows his thinking from highest centers (his ability to maintain conscious control over his thinking). Usually, the higher the "F+%," the higher the intelligence, within limits. According to Beck (1, p. 173), the normal person achieves at the 70 to 80 per cent range. Pathologic ideation supports a low "F+%," whereas rigid conscious intellectual control reflects high "F+%."
6. **Movement Per Cent (M%)**--The movement response is the sign of inner adjustment, or inner equilibrium. This tendency infers the power to absorb emotional stimuli coming from outside and within. Movement responses originate with the individual because there is no movement present on the cards. In a normal protocol, three or more movement responses are expected to indicate average native intelligence. Piotrowski (3, p. 87) contends that human movement is indicative of introversion when in excess in the experience balance. Movement is a sign of intelligence in superior, well-adjusted individuals. Movement responses are usually absent in severe psychopathological conditions.

7. **Color Per Cent (C%)**--Color is the principal indicator of "emotionality." Pure "C" is the use of color completely without form element, e.g., "Blood," "Sunset," etc. This is almost an entirely abnormal reaction. The tendency to use pure "C" responses reflects lack of emotional control, hyperexcitability, and instability of emotional processes. Such individuals are often found to be impulsive, explosive, and chaotic in terms of emotional control. According to Piotrowski (3, p. 115), pure color "is rarely found in normal adults unless in overproductive superior records." However, such finds are frequent in the protocols of manics and schizophrenics, and in the mentally defective, especially when maladjusted.
8. **Color Form Per Cent (CF%)**--This is the use of color and form in one perception, but with color being the major determinant in the reaction. It indicates egotism, a type of adjustment which is essentially egocentric. When "CF" exceeds "FC" (to be discussed next), the regard for self exceeds the regard for others. Adjustment at the "CF" level is more primitive, less stable, and more labile. Such individuals are characterized by some desire to adapt to their environment, but their intellectual control is not sufficient to effect good adaptation. The implication is that capacity for understanding is often limited, due to impulsiveness, demanding nature, and sensitivity to emotional stimuli.

9. **Form Color Per Cent (FC%)**--Form over color is viewed as good fusion of form and color. Form preference over color is indicative of good social and emotional adjustment. In this category, the response represents fusion of the "F" and "C" categories, with "F" being the major determining factor. Such individuals are described as being well adjusted and socially acceptable. They are emotionally mature and able to understand the social requirements and the rights and feelings of others. The implication is that these individuals have developed to such an extent that they are capable of maintaining conscious control and establishing rapport.

10. **Popular Per Cent (P%)**--Beck recognizes twenty-one popular responses. A popular response is one which
occurs approximately three times more frequently than the next most frequent "W" or "D" response and is given by not less than 14 per cent of the subjects in the standardization sample. The number of popular responses given by a person is an indicator of his ability to get along with others. Popular reactions are evidence of banal thinking when more than 50 per cent are found in a record. If there is a paucity of "P" (less than 15 to 20 per cent) in a record with a normal number of reactions, there is thinking that is out of community with normal thinking.

11. **Space Per Cent (S%)**—The space response is the result of the subject attending to one of the white spaces on the card. The tendency to give a space response is based on a personality which includes elements of contrariness and negativism. In an extraverted individual, "S" may be resistance and hostility against external activity and environmental stimuli; in an introverted record, it may mean an internal resistance, a feeling of inferiority. An excess of space responses is indicative of aberrant personality development.

**Subjects**

The primary sources of the data of this study were results obtained from the Rorschach Psychodiagnostic Technique (hereafter referred to as the Rorschach) administered to seventy "smokers" and "nonsmokers" of both sexes. A "smoker" was defined as an individual who smoked an average
of one package of cigarettes a day. The subjects consisted of nineteen male smokers, sixteen female smokers, twenty-two male nonsmokers, and thirteen female nonsmokers enrolled in Introductory English courses at Texas Christian University during the 1971-1972 academic year.

Secondary data were obtained from books, dissertations, theses, periodicals, and test manuals. These data were used for reviewing related studies as well as for comparison and evaluation of the findings of this study.

For purposes of this study, the total sample was composed of thirty-five "smokers" and thirty-five "nonsmokers." In the smoker group, there were nineteen males and sixteen females; in the nonsmoker group, there were twenty-two males and thirteen females. The mean age for smokers was 18.55 years, with the mean age for males and females being 18.78 years and 18.33 years, respectively. The mean age for nonsmokers was 18.53 years, the mean age for males being 18.91 years and that of the females, 18.15 years. The subjects used in this study were chosen on a voluntary basis from Texas Christian University, Fort Worth, Texas.

Procedures

An intensive review of the literature pertinent to the role of attitude as a factor in determining instructional method preference was made in order to provide a basis for the analysis and interpretation of data gathered
in this study. The following administrative instructions were given to each subject:

You will be given a series of ten cards, one by one. The cards have on them designs made up out of ink blots. Look at each card, and tell the examiner what you see on each card, or anything that might be represented there. Look at each card as you like; only be sure to tell the examiner everything that you see on the card as you look at it. When you have finished with a card, give it to the examiner as a sign that you are through with it (1, p. 4).

Upon the completion of this introduction, the subject began what Beck (1, p. 4) calls "the test proper," or free-association period. During this time, the examiner recorded the subject's responses, as well as any pertinent behavioral observations. Following the free-association period, the examiner placed the last card in the hands of the subject and read the first response he had given to it. The subject was then asked to outline the response and state what determined it. This procedure was repeated until it was determined for each response what the subject had responded to, and what determined this response.

Treatment of Data

The protocol for each subject was analyzed and percentages were determined for "W," "D," "Dd," "F," "F+," "M," "C," "CF," "FC," "P," and "S" responses. Mean responses were determined for the Rorschach indices of each smoker and nonsmoker.

Following the computation of means, Hotelling's $T^2$ was utilized as an overall test of within-subject effects.
The results of this statistical procedure indicated borderline significance. Therefore, a critical analysis was made and interpretations were drawn for the eleven Rorschach indices between smokers and nonsmokers. The mean, standard deviation, and Fisher's $t$ were obtained for each of the eleven Rorschach indices.
CHAPTER BIBLIOGRAPHY


CHAPTER II

SURVEY OF THE LITERATURE

Within recent years, medical and psychological research has emphasized the need for continued and intensive study regarding the "smoking habit." This need is evidenced by recent federal government legislation which requires cigarette manufacturers to warn the individual of the possible deleterious effects of cigarette smoking on his health.

A survey of the literature indicates that cigarette smoking may have a psychological basis. Wohlford and Giammona state,

Describing smoking as a contagious disease is a metaphor as profound as it is subtle. While cigarette smoking is causally related to lung cancer, and is associated with other diseases, no microbe of virus is conveyed from the cigarette to the victim. Smoking is conveyed from one person to another via a purely social or behavioral means. As is bacterial diseases, some individuals are susceptible to the initiation of smoking while others are resistant (7, p. 544).

Research in such facets of personality dynamics as related to age, sex, religion, marital status, socioeconomic and cultural attainment, educational background, mental ability, occupational endeavors, emotional adjustment, and self-concepts are cited as probable and significant areas for further study.
Haenszel, Schimkin, and Miller (5, p. 562) report that very few males below the age of ten and probably no females in this age group smoke. In the age range beyond adolescence, smoking and age exhibit a curvilinear relationship. For both sexes between the ages of 18 and 24 years, 38 per cent of the individuals were smokers; in the early middle-age group, 25 to 44 years, the percentage of smokers increases to 48 per cent; it then declines in those 65 and over to 12 per cent.

Wohlford and Giammona indicate that

The statistics on the prevalence of cigarette smoking may tell when children begin smoking; ten per cent of adult smokers begin before age thirteen, sixty-five per cent develop the habit in high school, and the remaining twenty-five per cent take up smoking after high school (8, p. 546).

These findings have been validated by other researchers in this area (Hammond and Horn, 1954, 1958; Sackrin and Conover, 1957).

Concerning sex and smoking, Haenszel (5, p. 27) found in a United States consensus survey that while 68 per cent of the male population over 18 years of age smoke, only 27 per cent of the women in the same age group smoke. In women, smoking is almost exclusively confined to cigarettes, whereas with men, only 47 per cent of the 68 per cent regularly smoke cigarettes exclusively. When sex and age of initiation were studied, it was found that in the 18 to 24 year age group, 34 per cent of the males had started smoking by age 18, and 50 per cent had started by age 24.
For females in the same age group, 16 per cent had begun by age 24.

In the past fifty years, the percentage of male smokers had changed very little. Females, however, had shown a significant increase. Whereas few women now in their middle forties smoked at an early age, 20 per cent of the women now in their twenties were regular smokers by the age of eighteen.

The data of Haenszel indicate that the age and sex differences mentioned above hold for non-white as well as white populations. There is no significant difference between the percentage of white and non-white smokers, according to this study. There is, however, a difference in the quantity of smoking. Among smokers, there is a significantly greater percentage of heavy cigarette smokers among the white population than there is among the non-white population. The percentage of heavy smokers among the whites is 13.3, and for non-whites, 6.9. The authors suggest the possible interaction of economic factors as a cause of these differences.

The proportion of males who smoke regularly increases from thirty-nine per cent of the men whose annual income is less than $1,000 to fifty-six to sixty per cent of those in the four income brackets from $2,000 to $7,000. For men receiving $7,000 and over, the regular cigarette smokers drop to a little over fifty per cent.

Less than one-fifth of the women whose personal incomes are less than $1,000 a year smoke regularly but the proportion increases to about one-third for women receiving incomes of $3,000 a year or more.
About one-fourth of the women who receive no personal income (largely homemakers) smoke cigarettes. Income appears to have a greater effect on the amount of smoking as in contrast to the percentage of smokers versus nonsmokers, although differences associated with age and other population characteristics were noted also (5, pp. 5, 19).

Allen reported on the smoking behavior of three different levels of socioeconomic status. The first group consisted of forty psychiatric patients from the Massachusetts General Hospital. These were studied by means of individual psychiatric interviews and a battery of individually-administered objective and projective personality tests. Of this group, thirty-one were cigarette smokers and nine were nonsmokers. The second group consisted of 114 female student nurses, of which fifty were smokers and sixty-four were nonsmokers. The third group included 140 male and female university undergraduate students. Of this group, seventeen of the females were smokers and thirty-one were nonsmokers; fifty-four of the males were smokers and thirty-eight were nonsmokers.

The measure of socioeconomic status used in each of the three groups was the Hollingshead Scale (Hollingshead and Redlich, 1958), an index which combines the subject's own (or his parents') education and present occupation to yield a single socioeconomic status score. Allen's data showed no relationship between socioeconomic status and smoking in any of the three experimental groups. Thus, this study of 294 subjects of widely varying socioeconomic status concludes that smoking seems to be unrelated to
this measure of socioeconomic status. However, a study by McArthur et al. (12, p. 269) indicated that, for Harvard undergraduates, "nonsmokers tend to be lower-middle class in origin, upwardly mobile, earnest young men . . . ."

Lilienfeld (10, p. 273) had concluded that "as far as the relationship between education and smoking is concerned, adult smokers and nonsmokers do not differ significantly in the final number of years of schooling completed. There were as many smokers as nonsmokers who had had no formal education, or who had attended college, etc." Lilienfeld concluded that since age and number of years of formal education are naturally correlated up to the average age of twenty-five, there is an increase in the percentage of smokers as the grade level of students still in school increases. A subsequent study by Kirchoff and Rigdon (9, p. 294) of 6,374 college students between the ages of fifteen and thirty-nine years showed just such an increase of 30 per cent to 60 per cent during four college years.

Horn, Courts, Taylor, and Soloman (8, p. 1503), in a study of the trends toward smoking in 22,000 high school students, has extended these observations back to the high school years. For the boys in the study, smoking increased from 14 per cent of the total in the freshman year to 35 per cent in the senior year. The girls increased from 4 per cent in the freshman year to 26 per cent in the senior year. The findings of this study do not appear to
be significantly conclusive and seem to indicate the need for more intensive research.

J. R. Earp (4, p. 446), in a study of college students, reported that of 177 students who smoked, 57 per cent did not graduate; but of 176 nonsmokers, only 31.8 per cent failed to obtain their degrees. However, Vallance (19, p. 141) points out that the previous findings of Earp are merely a correlation and reveal nothing about smoking resulting in college failures; it is a possibility that those students who make poor grades might consequently be the ones who take up smoking.

Lynn (11, p. 8), however, showed that adolescent boys who do not smoke will, on the average, make higher grades in school, fail less often, cause fewer disciplinary problems, make better scores on psychological tests, and be less troubled by respiratory diseases than the occasional smoker and the habitual smoker. The study also showed that smoking and poor scholarship do not always go together, in that grade averages according to age favor the nonsmokers in some cases and the smokers in others. Therefore, Lynn's study refutes, and seemingly contraindicates, those results as previously reported by Earp.

Allen (1, p. 42) concluded in a previously cited study that there exists no significant relationship between socio-economic status and the percentage of smokers in his three observed groups. However, he did derive that smoking is
related to intelligence quotient. The intelligence quotients were provided by the Wechsler Adult Intelligence Scale and the Otis Test of Mental Ability.

In the same study, Allen also provided for a measure of anxiety. The three groups were administered the Taylor Manifest Anxiety Scale. For the forty psychiatric patients, the mean anxiety score for the nonsmokers and smokers was significant at the .001 level, relative to the mean anxiety scores in the two samples of normals, both smokers and nonsmokers.

For the young normal subjects, smokers had higher anxiety scores than did nonsmokers. While the differences between means are not great, they nevertheless reach the statistically significant .05 level. When viewed in relation to the nonsmokers in the two normal groups, the higher anxiety scores among the normal smokers place the smokers at a point along an anxiety continuum which is closer to that of psychiatric patients.

Birdsong (3, p. 29) used the Taylor Manifest Anxiety Scale and the Blacky Pictures Test "to investigate the relationship between anxiety and orality as related to smoking." The results showed that (1) smokers show more anxiety than nonsmokers, and that female smokers show more anxiety than male smokers, both of which were significant, and (2) smokers do not show significantly more orality than nonsmokers.

In a study by Schneider and Houston (15, p. 942), 460 of 1025 contacted individuals completed the Taylor Manifest
Anxiety Scale and a questionnaire on smoking behavior. Data indicated that smokers, as a group, scored higher on the Anxiety Scale than did nonsmokers. No support for the notion of a significant correlation between the amount of smoking and the level of anxiety was obtained. The smoking subjects reported increases in smoking behavior during periods of stress, but indicated that these increases were usually not maintained beyond the period of stress.

Shubert (16, p. 376) administered the group form of the MMPI to a college group during freshman orientation. He concluded that (1) male and female smokers were significantly higher on the Ma scale than the non-smoking counterparts; (2) although female smokers were higher than female non-smokers on the D scale, the results were not significant; and (3) smokers of both sexes were lower on the Hy scale than nonsmokers, but the results were not significant.

Straits and Sechrest (18, p. 282) developed two questionnaires for the study of personality differences between smokers and nonsmokers. The first was a 270-item true-false personality inventory comprised of items from a number of well-known personality scales, plus some items from a scale designed to measure the extent to which an individual feels that what happens to him is dependent upon his own behavior, and not due to some chance factor. The second questionnaire was of a factual, biographical nature.
The major findings were as follows: (1) smokers were significantly higher on the MMPI Pd scale and significantly lower on the Sr scale; (2) smokers were more chance-oriented; (3) smokers were found to have lower L and Si scores on the MMPI, but these findings were not significant; and (4) smoking was significantly related to coffee and beer drinking, but was not related to the consumption of milk and soft drinks.

From these findings, the authors concluded, as previous descriptions had, that the smoker is a convivial person lacking in strong identification with cultural standards, and that the nonsmoker is at ease socially and imbued with a strong ethic.

Berger (2, p. 446) presents an item analysis of scores on the MMPI for eighty-one smoking and fifty-nine nonsmoking undergraduates, cross-validated with sixty smokers and forty nonsmokers. Ten items were found that significantly distinguished the groups, while an additional thirty-six items were suggestively discriminating. Results indicate that nonsmokers (1) generally showed greater aversion to social and other types of excitement, (2) indicated more worry about their health, and (3) admitted to a lack of confidence. Smokers revealed a preference for excitement and admitted to behavior conflicting with authority and social mores.

Steward and Livison (17, p. 227) tested the hypothesis that rebelliousness contributes to the etiology of cigarette
smokers, with data from two longitudinal studies. Comparisons were made between smokers and nonsmokers (as determined at age thirty) in the presmoking years, from kindergarten through high school, on several measures of rebelliousness. In every comparison for both sexes, the smokers showed greater rebelliousness. The difference was statistically significant in most instances. This difference persisted into adulthood; smokers of both sexes scored significantly lower on the Socialization scale of the California Psychological Inventory. In discussing the factors associated with initiation and continuance of smoking, the evidence indicating rebelliousness as related to the use of alcohol and drugs suggests that it would be heuristic to regard smoking as one of the addictions.

Reiter (13, p. 253) reports that thirty smokers and thirty nonsmokers differ significantly on the EPPS in Change (Chg), Nurturance (Nur), Exhibition (Exh), and Deference (Def). Smokers scored higher in Chg and Exh, while nonsmokers were higher in Nur and Def. The differences supported previous findings regarding less social responsibility among smokers.

The dearth of clear-cut findings in research can be blamed on such things as difficulty of controlling variables, the lack of adequate measures, or the lack of theoretical basis for the research. Only from a systematic and theoretical approach can there be developed testable hypotheses
that will contribute to greater understanding of the relationship between the personality dynamics of smokers and nonsmokers.


In Chapter I, it was stated that significant differences would exist on certain Rorschach indices between smokers and nonsmokers. To test the hypothesis, the raw data were treated for measures of central tendency and variability so that levels of significant differences could be determined. Hotelling's $T^2$ was employed as an overall test of within-subject effects:

$$T^2 = A^1 S^{-1} A$$

$S^{-1}$ is the inverse of the variance covariance matrix.

$A = n \times 1$ (column) Matrix of mean differences, where $n$ equals the number of mean differences.

$A^1$ = Transpose of Matrix A.

The resulting Hotelling's $T^2$ of 43.391 was significant at the .001 confidence level. The fact that this find was sufficient to reject the null hypothesis warrants further statistical treatment of the data.

Graphic presentation of the data is presented in Figure 1. In this figure, it is apparent that there are certain striking differences between smokers and nonsmokers on specific Rorschach indices.
Fig. 1--A comparison of the mean scores of smokers and nonsmokers on certain Rorschach indices.
However, when these data are subjected to treatment by Fisher's $t$, differences between smokers and nonsmokers become less apparent, as measured by the Rorschach. The results of the individual Fisher's $t$'s are presented in Table I. An inspection of Table I indicates four indices which show trends toward differentiating smokers and nonsmokers. The four indices which in future research may prove to be of most value are (1) $W$ per cent, (2) $Dd$ per cent, (3) $FC$ per cent, and (4) $P$ per cent.

### Table I

**Measures of Central Tendency and Variability, Fisher's $t$, and Levels of Significance Between the Means of Certain Rorschach Indices of Smokers and Nonsmokers**

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<td>1.0</td>
<td>1.0</td>
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<td>2.5</td>
</tr>
<tr>
<td>$CF$</td>
<td>4.9</td>
<td>5.9</td>
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</tr>
<tr>
<td>$FC$</td>
<td>9.2</td>
<td>5.9</td>
<td>6.4</td>
<td>5.8</td>
</tr>
<tr>
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<td>$S$</td>
<td>7.0</td>
<td>7.7</td>
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<td>6.2</td>
</tr>
</tbody>
</table>
The nonsmokers who participated in this study produced an average of 24.1 per cent whole responses, whereas the smokers produced 16.4 per cent. This is significant beyond the .05 level of significance. "In the Rorschach literature, ever since the publication of Rorschach's Psychodiagnostics, 'W' responses have been considered to represent the abstract, surveying, and integrating abilities of the subject" (2, p. 78). Thus, it would appear that the nonsmoker is characterized by a greater tendency to organize his environment and deal with it as a whole.

Since the present research indicates a trend for nonsmokers to have greater integrative and abstracting skills, it might be assumed that the smoker would have a tendency to respond more on an obvious or concrete basis. The data in Table I, however, indicate that smokers and nonsmokers do not differ significantly on D per cent. On Dd per cent, however, smokers produced an average of 17.1 per cent responses, whereas the nonsmokers produced an average of 9.8 per cent. This difference is significant beyond the .001 per cent level of confidence. On the basis of these data, it might be assumed that the smoker has a tendency to apply his intelligence in a minute, detailed, scientific manner, and that he is a person who has a lowered drive for seeking relationships between presented fact and environmental experiences.
In Chapter I, it was stated that all behavior is caused by the organism. On the basis of the W and Dd data, it is plausible to assume that the smoker may "cause" himself to view facts in a somewhat unrelated manner. However, further research is needed to support this assumption.

The final two Rorschach indices, FC per cent and P per cent, will be discussed together, due to their interrelationship. When smokers and nonsmokers were compared on the FC per cent and the P per cent, the smokers appeared to be more socially oriented. Their higher FC per cent (significance beyond the .05 level) coupled with a higher P per cent (significance beyond the .05 level) suggested a personality structure characterized by occasional inappropriate and unsuccessful attempts at socialization, i.e., a wish to please everyone, and a lack of cohesive clarity and sincerity of character.

Adler (1, p. 269) suggested that man may smoke because he wants to incorporate smoking into his style of life. It is possible that the individual may feel inferior when surrounded by others who give the impression of pleasure while they smoke. Because the individual does not obtain this pleasure, he may develop feelings of inferiority and be driven to smoking in order to gain a feeling of superiority. By smoking, the individual is able to identify with others in a social interest. Once the "habit" of smoking is started, it is incorporated into the person's style of
life. Eliminating the practice of cigarette smoking is most difficult if one is surrounded by others who continue to smoke, due to the feeling of social interest which molds him to their patterns of behavior. Others do not smoke because the refusal to indulge in an activity which they consider to be inferior and degrading satisfies their strivings for superiority. By refusing to conform to a social habit which seems to be undesirable, the nonsmoking individual may gain a sense of superiority. The decision to smoke or not to smoke illustrates the uniqueness of man's personality and the individuality of his life style.

In conclusion, the present study indicates that significant differences exist between smokers and nonsmokers. Further research involving a more intensive sampling procedure, or a different sampling population, may be necessary to clarify these results.
CHAPTER BIBLIOGRAPHY


CHAPTER IV

SUMMARY

The purpose of the present investigation was to compare a group of college smokers with a similar group of college nonsmokers on eleven Rorschach indices. The subjects consisted of nineteen male smokers, sixteen female smokers, twenty-two male nonsmokers, and thirteen female nonsmokers enrolled in Introductory English courses at Texas Christian University during the 1971-1972 academic year. The Rorschach Psychodiagnostic Technique was administered and scored according to the method reported by Beck. An overall test of significance was computed and was followed by tests of significance between groups on each Rorschach index.

The null hypothesis, which stated that there would be no significant differences between smokers and nonsmokers, was tested on the following variables: (1) W per cent, (2) D per cent, (3) Dd per cent, (4) F per cent, (5) F+ per cent, (6) M per cent, (7) C per cent, (8) CF per cent, (9) FC per cent, (10) P per cent, and (11) S per cent.

The overall test of within-subject effects indicates that significant differences do exist between smokers and nonsmokers. Further statistical treatment of the data indicates that the four indices which, in future research,
may prove to be of most value are (1) W per cent, (2) Dd per cent, (3) FC per cent, and (4) P per cent.

The conclusions of this thesis should not be generalized beyond the college-student population without the benefit of further research. The following recommendations are offered for future studies related to this thesis:

(1) more intensive sampling procedures should be employed in order to reduce the risk of biases due to a nonrandom and unrepresentative sample;

(2) a different method of statistical analysis should be used to eliminate the confounding effect of the variability of the total number of responses; and

(3) the scope of the study should be broadened to include a greater number of Rorschach variables.
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