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Does smoking produce an emotional relaxation?

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DOES SMOKING PRODUCE AN EMOTIONAL RELAXATION? 2

A Thesis

Presented to

The Faculty of the Department of Psychology

The College of the Pacific

08848
JUN 1957

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

By

Louis Allen Kreiss, Jr.

June 1957

To my wife for her devotion
and tireless assistance

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CHAPTER I

INTRODUCTION

I. INTEREST

Need for this investigation. The interest that has been aroused in the general public by the cigarette manufacturers with their publicity claims, pro and con, as to the effects of their particular brand of cigarettes upon the emotional reaction of the smoker, has offered the stimulus for this research.

II. STATEMENT OF THE PROBLEM

Physiological or psychological. The research reported here represents an experimental attempt to reveal the relationship between the physiological and psychological responses to smoking.

III. THE THESIS

Does smoking produce emotional relaxation? This report is an outgrowth of experiments of similar nature which have been completed in the past. The report covers the data from an experiment attempting to show some statistical evidence that there possibly is emotional relaxation resulting from the smoking of a cigarette.

IV. THE OBJECTIVE

The objective. The objective of this research is to show that smoking produces emotional relaxation. This hypothesis will be tested by applying the following null hypothesis. Under experimentally controlled circumstances, there will be no statistically significant difference in physiological responses when a warm air placebo is compared with either a high nicotine non-filtered cigarette, or a low nicotine content filtered cigarette (smoked by volunteer subjects through identical tubes.)

V. METHOD OF ATTACK

Experimental. The research was built around a simulated smoking situation. Three variables were employed, but the subjects were otherwise held as close to a normal smoking situation as possible.

VI. BRIEF SUMMARY OF FINDINGS

Analysis. The data indicate the advisability of rejecting the original hypothesis, but other evidence supports the hypothesis that the need for smoking is psychological in nature.

CHAPTER II

THE EXPERIMENTAL APPARATUS

Reference. The basic principles of this experimental design were developed by C. L. Hull in 1924. Guilford explains Hull's experiment in his text The Fields of Psychology.¹ The original test indicated that subjects were unable, under experimentally controlled circumstances, to distinguish between the smoking of a pipe heated by an electrical coil and a pipe loaded with ordinary tobacco.

Hull was primarily interested in the motor changes resulting from smoking, and the possibility of obtaining a different motor pattern in the subjects who were administered normal tobacco from those smoking air (the placebo).¹

At this point this research departed from the original experiment. Whereas Hull's experiment had been primarily designed to test only one factor, this research was an attempt to examine and show three statistical relationships of two factors, one representing the physiological response and the other representing the psychological response. (The investigator accepted the fact that the subject being

¹J. P. Guilford, Fields of Psychology (New York: D. Van Nostrand Company, Inc., 1950), pp. 493-95.

tested will not be able to distinguish between the normal cigarette, which was used in this case, the intermediate stimulus which was a low nicotine, highly filtered cigarette, and, last, a warm air placebo).

A null hypothesis would state that there would be no physiological differences when a subject smokes through a tube one of the above under experimentally controlled circumstances. The measurement of the blood pressure and pulse was used as a means of determining if there were any appreciable difference in the subject being tested when allowed to sample the three stimuli.

Carlson and Johnson emphasize the stimulating effect [nicotine has upon the human heart], which is commonly called palpitation of the heart, or simply an increase in heart rate. Their text also states that there is an increase in blood pressure in most cases resulting from the smoking of a cigarette.²

In most textbooks which were examined while preparing for this research it was found that the authors believed that nicotine was the prime mover stimulating physiological

²Anton J. Carlson and Victor Johnson, The Machinery of the Body (Chicago: The University of Chicago Press, 1949), p. 357.

response. But there were others who differed, such as A.

D. Busch who stated in his report, Tobacco Smoking and Mental Efficiency:

Nicotine is popularly assumed to be the drug present in tobacco smoke, but it is doubtful if it exists in smoke at all except possibly from a rapidly smoked cigarette. Busch has shown that a large number of toxic substances may be present in tobacco smoke and it is possible that pyridine, which was found by Busch in all tobacco smoke tested, may be its principal toxic substance. [Blood pressure is increased and heartrate is stimulated uniformly by tobacco smoking. Digestive secretions are stimulated. Habitual users do not establish a physiological tolerance for it.]^P

The reader will notice that Busch does not feel that nicotine alone is the stimulus affecting the smoker.

His research tentatively showed that there is no prolonged reaction resulting from smoking, and a habitual smoker does not build up a physiological tolerance to the stimulus offered by the cigarette. It is for this reason that in the present research only a short rest period was allowed between the administering of the warm air placebo and of the two graded cigarettes.

Another factor that was encountered in preparing for this research was the lack of reference material available which could be referred to on a statistical level. Much of

³A. D. Busch, "Tobacco Smoking and Mental Efficiency," The American Medical Association Journal, II (November, 1914), 520.

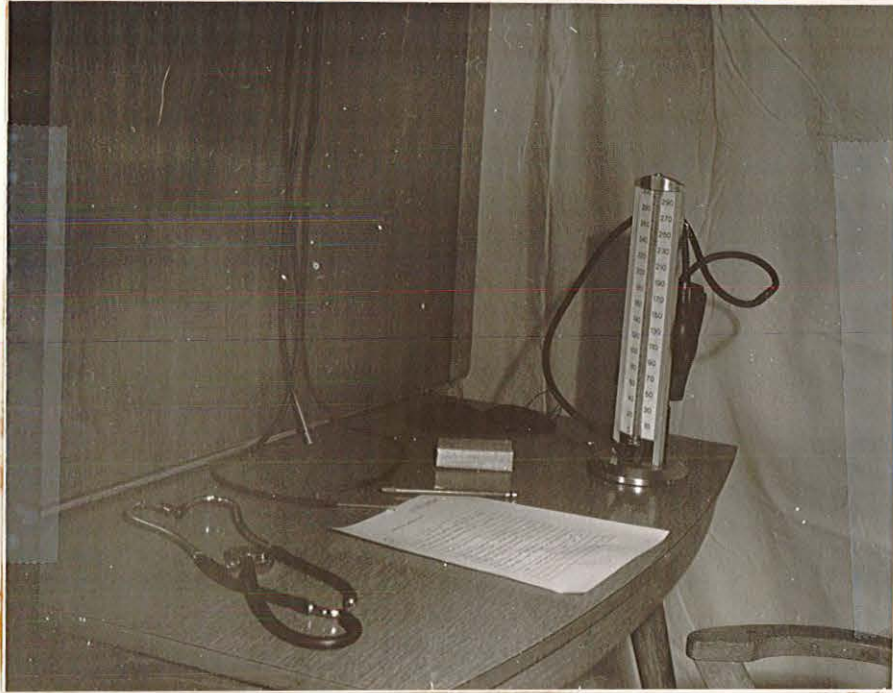
the information encountered was of a negative sort revealing simply the opinion of the writer, depending on personal beliefs and offering few scientific facts.

Testing design. The experimental equipment was designed for efficiency and the convenience of the experimental team. This allowed for accurate timing.

The simplicity of the equipment made for minimum manipulation, as there were only three mechanical factors, the tube leading from the warm air placebo apparatus, the tube leading from the high nicotine non-filtered cigarette, and the tube leading from the low nicotine content cigarette.

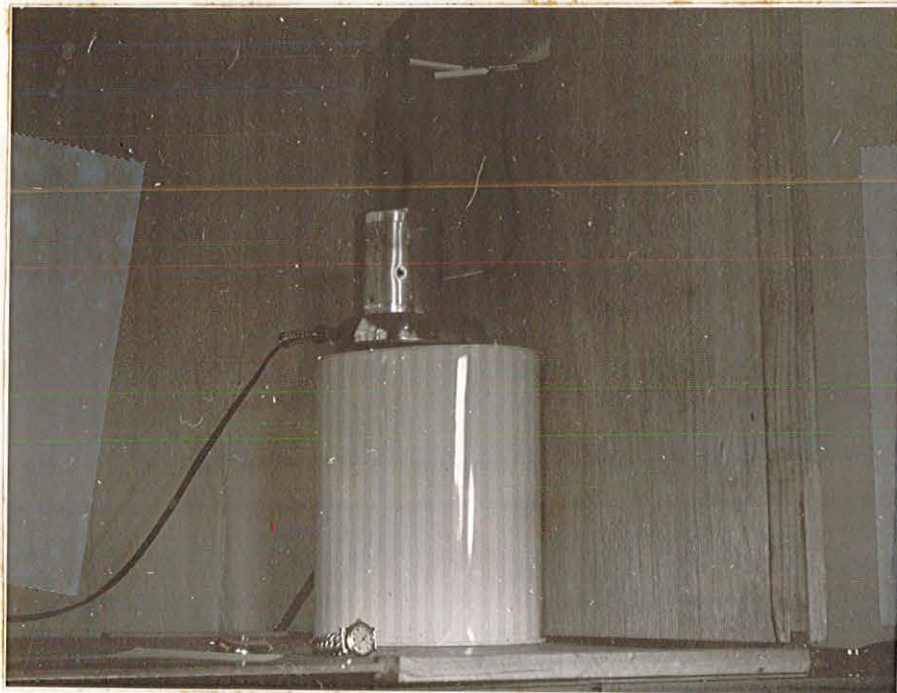
There was an L shaped, hinged, plywood panel, shielding the placebo and smoking apparatus from the subject. All the subject could see upon entering the experimental room was the vertical panel with three unidentified tubes protruding. The entire apparatus was mounted on top of a desk. (See Illustration A.)

A medical blood pressure unit, a stop watch, and a stethoscope were used to record both blood pressure and heart rate. The subject also saw a package of unidentified cigarettes lying in front of the apparatus along with a night mask and an application questionnaire. It was felt that the apparatus would be psychologically accepted because almost everyone has had his blood pressure or heart rate



Above Illustration A.

Below Illustration B.



checked in a doctor's office. Also, most adults would be familiar with the night mask, which originated during the Second World War to allow day sleepers total darkness, thus improving their chances for sleep.

The construction of the placebo, or warm air apparatus, was accomplished by converting a ten-inch aluminum decanter to limit the heat to a level comparable to that of a burning cigarette. An electric hot plate was used to provide the heat for the warm air placebo.

Two cigarette holders were attached to two of the three tubes behind the apparatus (See Illustration B.). They housed the cigarettes. The third tube was attached to a pipe leading from the warm air placebo. Glass eye droppers served as mouth-pieces on the ends of the three tubes visible to the subject.

CHAPTER III

APPLICATION QUESTIONNAIRE

Degree of smoking experience. Even though the original purpose for the application questionnaire was to allow time for relaxation to take place while the subject was completing the desired information, the responses were interesting and had definite bearing on the research. (See sample next page.)

The subjects were entirely volunteer and represented many walks of life, ranging from a waitress to a bank officer. Each subject was accepted only if he or she had been habitual smokers for three years or more. This suggestion was obtained through consultation with a number of medical men. [They felt that a person could only be called an habitual smoker after smoking for at least three years.] It was found that the subjects' smoking experience ranged from three years to forty years of habitual smoking. Of the fifteen subjects tested, the average length of smoking experience was twenty years.

About 90% of the subjects stated that they liked to smoke anytime. [The average consumption of the majority of the subjects tested was a package to a package and a half of cigarettes per day.] One-third of the fifteen subjects tested preferred the same brand of cigarettes.

(Sample)

Experimental Psychology
College of the Pacific

Application Questionnaire

Mr.
Miss
Mrs.

Name. _____

Date. _____ Occupation. _____

Please fill out the following to the best of your ability.

1. How long have you been smoking? _____

2. Do you feel that smoking relaxes you? _____ Explain. _____

3. What are your smoking habits? _____

4. What brand of cigarette do you smoke? _____

5. What particular time of day do you smoke? _____

6. What particular place do you smoke? _____

7. What is your reason for smoking? _____

8. Do you feel relaxed after smoking? _____

9. Do you usually smoke more alone, or with someone else? _____

Date	Blood Pressure	Pulse	Yes	No
------	----------------	-------	-----	----

1. _____

2. _____

3. _____

Habits of smoking. When subjects were asked whether they had a particular place where they liked to smoke, more than 60% did not designate a specific place where they enjoyed smoking, but emphasized that any place would be acceptable. When the subjects were asked their reason for smoking, over one-third felt that it was only a habit. The rest gave reasons ranging from "just something to do," to "don't know why." When the subjects were asked whether smoking relaxed them, about 50% felt that they were relaxed somewhat either while smoking or after smoking. About 20% did not feel that they were relaxed at all from smoking. When the subjects were asked whether they preferred to smoke alone or with someone else, about 20% definitely preferred to smoke alone, and the other 80% stated it made no particular difference, or definitely preferred to smoke while in the company of someone else. (See Appendix I.)

CHAPTER IV

CONTROLS

Explanation. Because it was necessary to keep strict controls throughout such an experiment, each experiment was carried on in the same room. The room was a private office closed off from all post-experiment observation by the subject.

It was necessary to prepare an outline in chronological order which would explain to the subject what would be expected of him throughout the experiment. This control was used to reassure the subject against any danger while taking part in the experiment. (See sample next page.)

Night goggles were used, since Hull found that when visual perception was blocked the perceptions would depend on the other physiological perceptors.³ In this case the investigator found through investigation before this experiment began that most smokers gauge their smoking by observation of the cigarette and the smoke exhaled.

As in Hull's experiment, it was also found in this experiment that a night mask or blindfold was necessary to stop the subject from observing that he or she would not be

³Oliver L. Lacey, Statistical Methods in Experimentation (New York: The Macmillan Company, 1953), pp. 15-16.

(Sample)

YOUR PART IN THE EXPERIMENT

1. After entering the experimental room, will you please try to relax as you fill out a simple information blank.
2. After you are blindfolded and relaxed, your blood pressure and pulse will be checked.
3. This test will only require you to smoke through a tube which will be handed to you after you are blindfolded.
4. When you are smoking, please do not inhale. Please draw the smoke into your mouth and out through your mouth - Not through your nose.
5. After smoking for 5 minutes, you will be asked one question. Also your blood pressure and pulse will be checked for the last time.

We will meet again this following Saturday to repeat the same process. After next Saturday's experiment, I will explain this experiment and answer any questions you might wish to ask. Thank you for your sincere interest and help.

inhaling smoke when puffing through the tube leading to the warm air placebo.⁴

Each subject was allowed a controlled relaxation period to insure validity and reliability of each test, which will be explained further in the following chapter.

⁴Guilford, loc. cit., p. 394.

CHAPTER V

METHODS AND TECHNIQUES OF ACTUAL TEST I AND II

Test I. After each subject had read through the outline explaining his part in the experiment he was asked to come in from the waiting room. (See Illustration C.)

Upon entering the experimental room each subject was asked to sit down and fill out the application blank which was lying on the desk in front of him. Casual conversation was carried on between the experimental team and each subject, on any topic but the experiment itself. (See Illustration D.)

The subject was allowed a ten-minute relaxation period before the experiment began. Each subject usually finished his application questionnaire within three to five minutes from the time he sat down. At the end of five minutes the subject was asked to put on the night mask, and his heart rate was checked by one of the experimental team and recorded by the other member. (See Illustration E.) Then the blood pressure was taken three times and the average of the three readings was recorded. (See Illustration F.)

From the time the subject entered the experimental room the stop watch was used to establish the ten-minute period before the experiment began.



Illustration C.



Illustration D.



Illustration E.



Illustration F.

At the end of ten minutes one of the experimental team members gave the blind-folded subject one of the following tubes:

- A. A low nicotine content filtered cigarette.
- B. A high nicotine non-filtered cigarette.
- C. A warm air placebo.

The subject was again asked to puff in through the mouth and out through the mouth, and not to inhale.

It was necessary that tube C be administered at the beginning of the experiment, alternating between the first test for one subject and the beginning of the second test at a later date for another subject. (Preliminary investigation of the blood pressure of a person smoking the placebo taken within intervals of a minute apart, showed no prolonged physiological response after five minutes.) If the subject received tube C during the first test, he or she was allowed a five-minute rest period at the duration of the experiment.

After tube C and the five-minute rest period, the subject was given either tube A or tube B, the remaining tube being held for the second part of the experiment at a later date.

In both the above cases, whether it was tube A, tube B, or tube C, the subject was allowed to smoke as normally as possible, without inhaling, for a period of four minutes. (See Illustration G.) At that point the subject's heart

rate was recorded. (See Illustration H.) At the end of five minutes the blood pressure was again measured and recorded. (See Illustration I-J.)

At this point the blindfold was removed and the subject made a definite appointment to meet at his convenience for the second and final setting for the experiment.

Test II. Test II was carried on in the same order as test I, except that there was no application questionnaire to be completed. If the subject had received tube C at the beginning of test I at an earlier date, he or she would receive tube A or tube B, depending on which tube remained to be sampled. If the subject was one of the alternate subjects, he would receive tube C at the beginning of test II and the later tube of A or B depending on which he or she did not receive in test I. Example follows:

Test I		Test II
C / A		B
	Alternate	
B		C / A
	Alternate	
A		C / B
	Alternate	
C / B		A



Illustration G.



Illustration H.



Illustration I.



Illustration J.

CHAPTER VI

STATISTICAL ANALYSIS

All computations throughout the following analysis were carried out to two decimal places, but were checked to assure that a third decimal place would not be necessary. The standard of reliability used throughout the analysis was arbitrarily placed at the .05 level of confidence with 2 degrees of freedom.⁵ All blood pressure scores were computed from only the diastolic reading and were rounded off to prevent error in recording.

Reliability of raw scores. The raw scores were compiled in alphabetical order for blood pressure and pulse rate according to each test. The cases were arranged in chronological order based on the first to the last appointment of each of the fifteen subjects. (See Appendix II.)

Range of raw scores. Although the statistics were not computed at this level, the ranges for tests A, B and C were of some significance because there were three high scores recorded for blood pressure with a reading of 190, and all from separate tests. (See Figure I.)

⁵Lacey, op. cit., pp. 148-149.

The pulse rate range revealed interesting relations between the three high scores of test A, B and C, tests A and C falling at the same level and test B, which could have been expected to be higher, being 24 points lower than the high scores of A or B.

The low scores recorded for blood pressure were also thought significant since the range for A and C was from 10 to 20 points higher than for test B.

The pulse rate was considered significant since tests A and B reached the same low point, but the low range for test C fell 24 points below either test A or B. (See Figure I.)

Deviation scores, disregarding signs. After examining the range, the raw scores for A, B and C were recorded for the blood pressure recording signs to be used later. The blood pressure deviations for test A, B and C for pulse rate were recorded, also, keeping the signs to be used later. The pulse rate deviations were also totaled disregarding signs. (See Table II.)

Distribution of plus and minus deviations. On the chance it would be significant, the plus and minus deviations were graphed for both blood pressure and pulse. The text,

FIGURE I

BLOOD PRESSURE AND PULSE RANGE
BEFORE AND AFTER TEST.

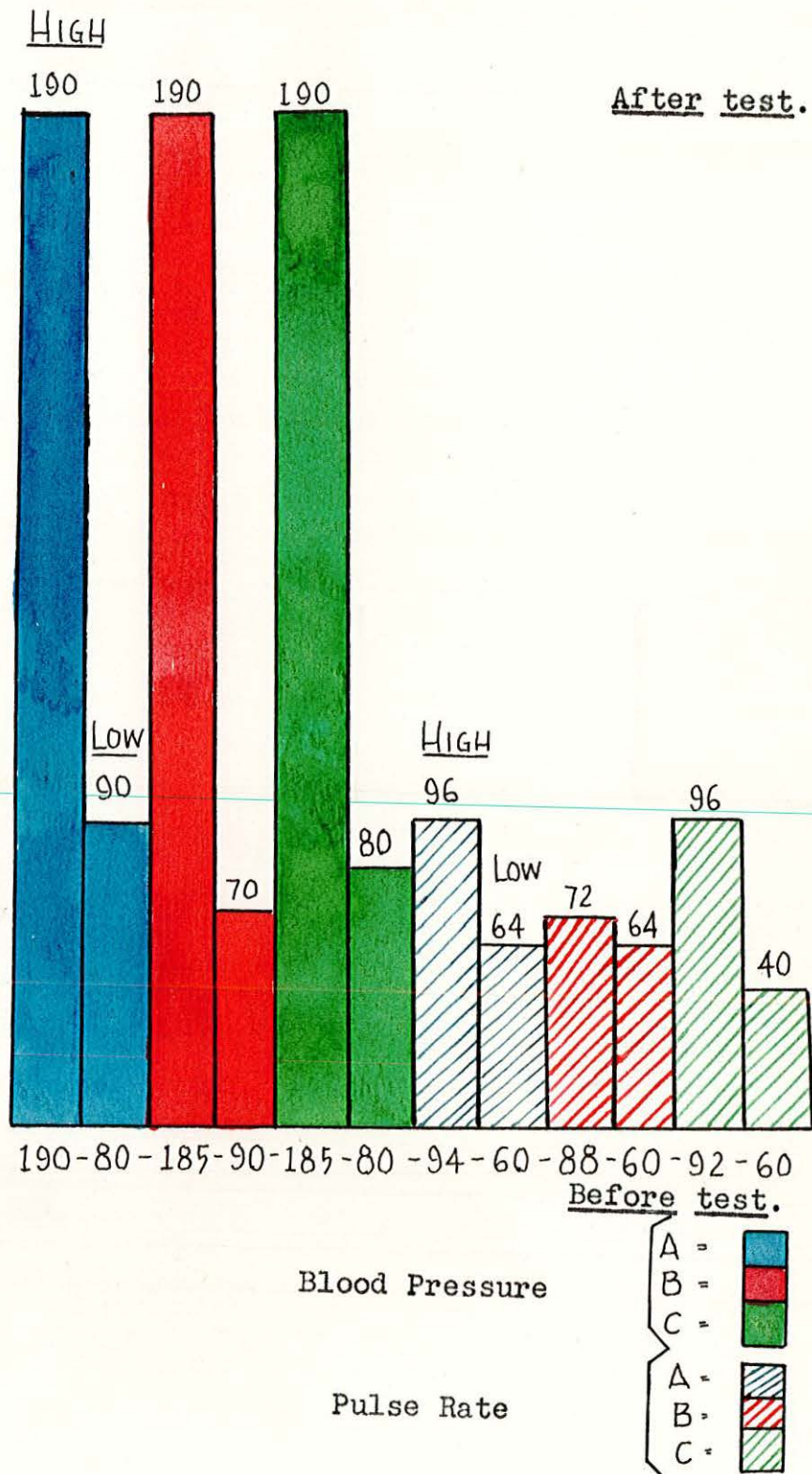


TABLE I
DEVIATION SCORES, DISREGARDING SIGNS
BLOOD PRESSURE

A	B	C	TOTAL
F.	F.	F.	
-10	-10	0	20
/10	0	0	10
/10	-10	0	20
0	-10	- 5	15
0	/10	-20	30
/ 5	/ 5	/ 5	15
/10	-10	- 5	25
0	-10	-10	20
- 5	0	/10	15
/ 5	-10	0	15
0	0	0	0
-10	-10	/10	30
- 5	-10	0	15
/10	-20	0	30
<u>0</u>	<u>/ 5</u>	<u>/ 5</u>	<u>10</u>
80	120	70	270

DEVIATION SCORES TOTAL

TABLE II
DEVIATION SCORES, DISREGARDING SIGNS
PULSE RATE

A	B	C	TOTAL
F.	F.	F.	
0	/ 4	/ 4	8
/ 4	/ 4	- 4	12
- 4	- 8	/ 4	16
- 4	/ 4	0	8
/ 8	/ 4	/ 4	16
/ 4	/ 2	/ 2	8
/ 8	- 8	0	16
/ 16	/ 4	- 4	24
/ 2	/ 12	/ 4	18
/ 4	/ 4	- 20	28
0	0	0	0
/ 8	- 16	- 8	32
- 12	0	0	12
0	/ 8	- 2	10
- 8	0	- 2	10
<u>82</u>	<u>78</u>	<u>58</u>	<u>218</u>

DEVIATION SCORES TOTAL

The Elements of Research,⁶ emphasized the need for such a graph. The blood pressure deviations showed an interesting spread (both plus and minus readings falling at the 10 point level in almost 30% of the cases). Also about 14% of both plus and minus deviations fell below the 5 point level.

All blood pressure deviation scores for tests A, B and C revealed an interesting similarity of pattern. (See Figure 3.)

The pulse rate for both plus and minus readings revealed a very erratic behavior when graphed. The only two levels which showed similarity were the 4 point level for plus and minus which included around 25% of the data. Also the 8% level for plus and minus included around 13% points. (See Figure 4.)

Statistical Analysis. The blood pressure and pulse rate deviations were added separately and totaled. The average change was computed by dividing the number of cases into each of the raw totals. The means was established by using the formula for finding s.d. from the text, Statistical Methods in Experimentation.⁷ The standard deviation was then computed using the same formula. All results were recorded in one table for easy comparison. (See Table III.)

⁶Frederick Lamson Whitney, The Elements of Research (New York: Prentice-Hall Inc., 1954), pp. 390-391.

⁷Lacey, op. cit., p. 75.

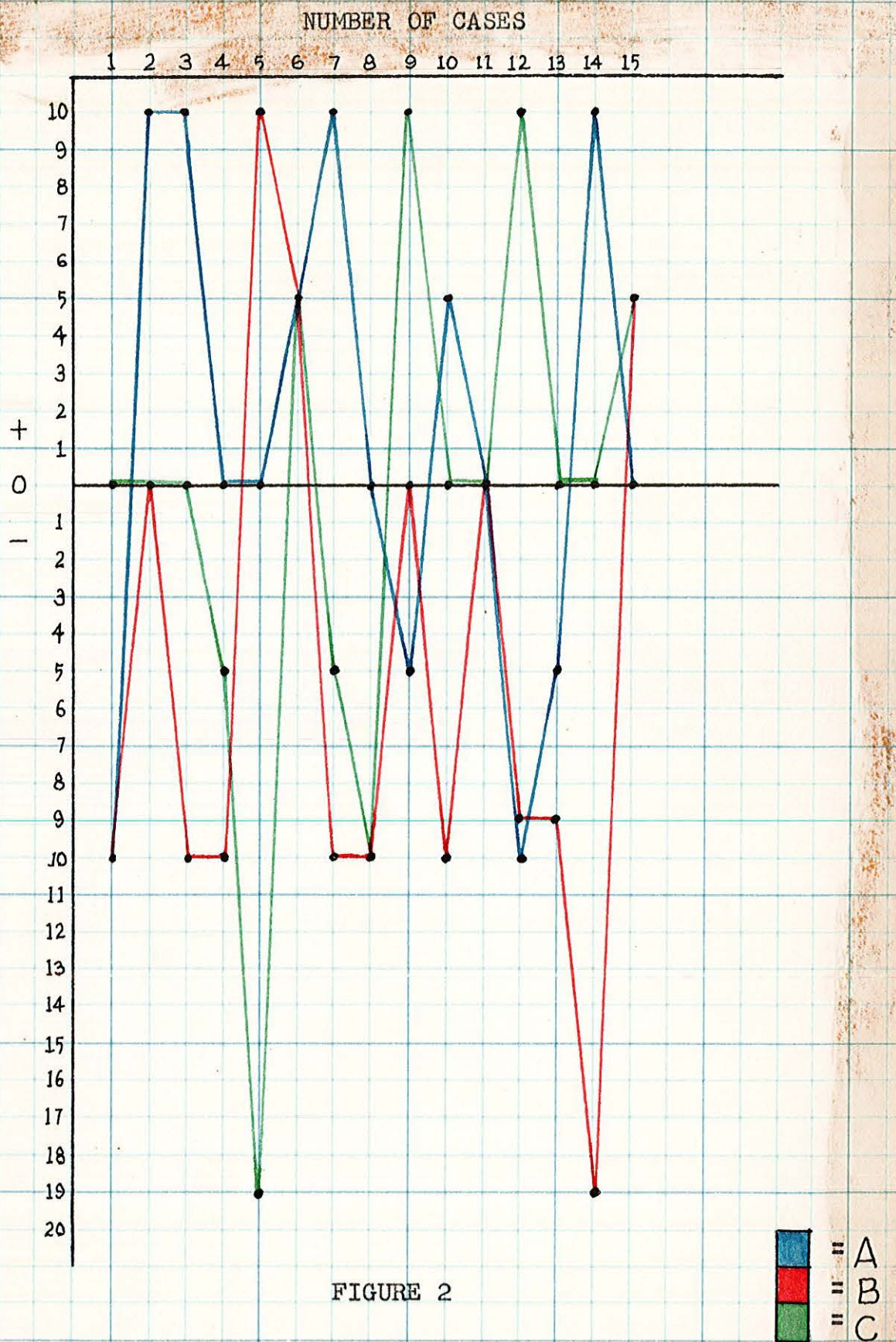
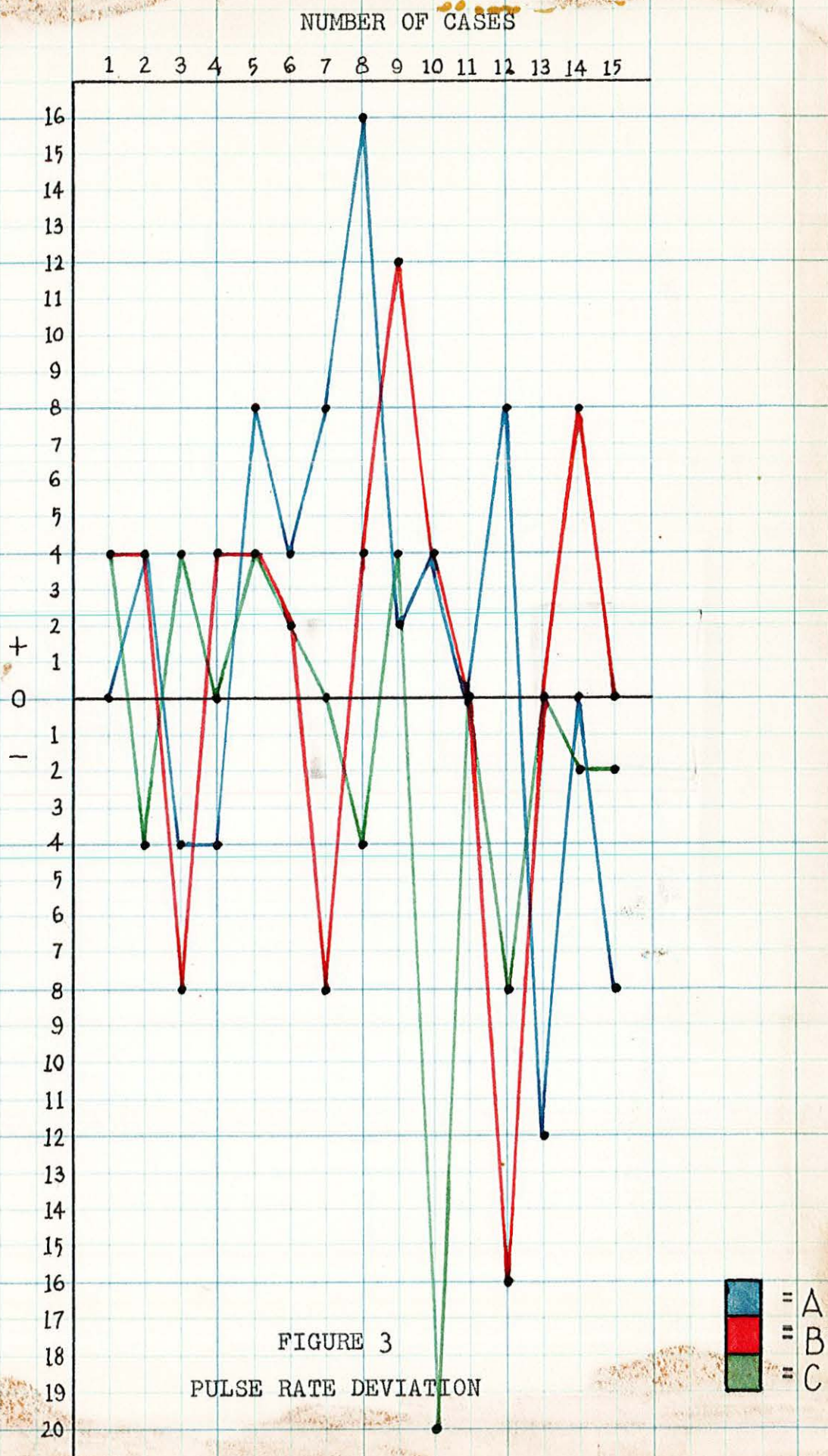


FIGURE 2

BLOOD PRESSURE DEVIATION



Significance of the difference. [The differences between tests, A, B and C (A being the highly filtered low nicotine content cigarette, B the high nicotine non-filtered cigarette, and C being the warm air placebo) were found to be significant in their effects upon blood pressure and pulse rate.] When the chi square computation was applied, it was found that the similarities between experiments A, B and C were not significant at the .05 level of reliability with two degrees of freedom. The null-hypothesis was therefore rejected.⁸

⁸Lacey loc. cit. pp. 148-149.

TABLE III

ALGEBRAIC TOTAL, AVERAGE CHANGE, MEANS, STANDARD DEVIATIONS

Blood pressure			ALGEBRAIC TOTAL	Pulse rate		
A	B	C		A	B	C
420	-80	-10		426	414	-22
			AVERAGE CHANGE			
A	B	C		A	B	C
5.33	8.	4.63		5.46	5.2	3.86
			MEANS			
A	B	C		A	B	C
112.33	114.66	114.		75.86	75.06	75.33
			STANDARD DEVIATION			
A	B	C		A	B	C
7.07	9.06	6.43		7.26	6.96	5.29

CHAPTER VII

SUMMARY AND CONCLUSION

I GENERAL SUMMARY

[An experiment was conducted to test the hypothesis that there would be no significant physiological difference when the effects of a low-nicotine, highly filtered cigarette, a high-nicotine, non-filtered cigarette, and a warm-air placebo were compared experimentally.]

The literature was reviewed, and as no parallel studies were found, all research which would aid this investigation was examined.

The experimental equipment was designed and pre-tested. The reliability of the equipment was established.

A set place was established and volunteer subjects were found and accepted, numbering fifteen in all.

Three tests were staggered into two different settings for each group by appointment within a duration of one week.

The computation of the data revealed interesting psychological findings, but the statistics necessitated a rejection of the original hypothesis.

II CONCLUSIONS

In general, the statistical analysis did not yield the similarity necessary to corroborate the study's original hypothesis. However, the responses to the application questionnaire showed some evidence of a social need for smoking, and, as was stated in the chapter on the application questionnaire, about 50% of the smokers felt relaxed either while smoking or after smoking.

It was felt by the experimenter that the decrease in blood pressure produced by the non-filtered cigarette when compared to the highly filtered cigarette, and the 4-point increase in pulse rate with the non-filtered cigarette as compared to the 26-point increase with the highly filtered cigarette gave reason to suspect a relaxation due to the smoker's need and habitual use of nicotine.

At the end of each experimental sitting the subjects were asked whether they were smoking their brand of cigarettes. These results also revealed psychological data of significance. Of the fifteen subjects tested, 86.67 per cent stated that this was not their cigarette. The 13.33 per cent remaining stated that this was their brand. The most striking finding of all was that no subject suspected that the placebo was not a cigarette at all.

III FURTHER STUDIES NEEDED

Since the sampling was small, a more extensive study with possibly 100 to 200 cases might produce more reliable statistics, possibly bearing out the original psychological null-hypothesis of this study.

Therefore, further study is definitely needed, possibly with the addition of a better measuring device for a larger sample.

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A book that is more necessary for experimental research than any other one book.

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A text which offers a good working understanding of statistical comparison of groups.

Whitney, Frederick Lamson. The Elements of Research. New York: Prentice-Hall, Inc., 1950. 539 pp.

A book of excellent quality which leaves the student with a good understanding of the theories behind research.

APPENDIX

APPENDIX I

Data From Application Questionnaire

<u>OCCUPATION</u>	<u>Question I.</u> How Long Have You Been Smoking?
1. Student	1. 3 years
2. Teacher	2. 40 years on and off
3. Librarian	3. 7 years
4. Service Station Attendant	4. 27 years
5. Student	5. 7 years
6. Housewife	6. 6 years
7. Housewife	7. 23 years
8. Housewife	8. 17 years
9. Sausage Maker	9. 24 years
10. Bank Officer	10. 20 years
11. Teacher	11. 20 years
12. Salesman	12. 20 years
13. Diesel Mechanic	13. 16 years
14. Waitress	14. 26 years
15. Painter	15. 25 years

Question II. Do You Feel That Smoking Relaxes You - Explain.

(Verbatim)

1. Yes -- Something to do.
2. Yes -- Tends to relax me.

3. No --- I smoke to release tension. (Something to do.)
4. Yes --- It seems to steady my nerves.
5. Yes --- I never analyzed it.
6. Yes --- It does relax me.
7. Yes --- It just gives me something to do.
8. Yes --- Something to do with my hands.
9. Yes and No -- Yes, when I smoke moderately.
No, when I smoke heavy.
10. No --- But smoking does not make me nervous.
11. No ---
12. No ---
13. --- At times perhaps but not at all times.
14. Yes --- When nervous, a cigarette seems to quiet nerves.
15. Yes --- It tends to relieve nervous tension.

Question III. What Are Your Smoking Habits?

(Verbatim)

1. All during the day.
2. Average about 1 cigarette an hour, a pack every 2 days.
3. One pack a day.
4. Approximately 15 to 20 cigarettes.
5. Any lady-like place.
6. Any time, any place.
7. Lighting and then letting cigarette burn up.
8. Smoke all day long.
9. Anytime but in sleeping times.
10. Cigarettes and some cigars.
11. A package a day.
12. Any time.
13. Average of 30 cigarettes a day, more or less.
14. I smoke one package of cigarettes in twenty-four hours.
15. I smoke about a package a day, a cigarette tastes best after eating.

Question IV. What Brand of Cigarettes Do You Smoke?

(Verbatim)

1. Lucky Strike
2. Phillip Morris
3. Viceroy
4. Wings
5. Marlboro
6. Lucky Strike

7. Mostly Chesterfield.
8. Wings
9. Winston
10. Lucky Strike
11. Raleigh
12. Chesterfield
13. Marlboro
14. Lucky Strike
15. Lucky Strike

Question V. What Particular Time of Day Do You Smoke?

(Verbatim)

1. No special time.
2. All hours, not before breakfast.
3. Anytime.
4. Morning.
5. Anytime.
6. Anytime.
7. All day.
8. All times.
9. Any hours, especially after meals.
10. From 9 A.M. to 4 P.M.
11. All day.
12. Anytime.
13. All day.
14. Anytime.
15. All times.

Question VI. What Particular Place Do You Smoke?

(Verbatim)

1. During school breaks.
2. Any place.
3. Anywhere.
4. Any place.
5. Any time.
6. Bedroom.
7. Any place, but street and church.
8. No particular place.
9. During work time and outside.
10. Office and home.
11. Every where.
12. Any place.

13. Wherever permitted.
14. Anywhere.
15. Everywhere.

Question VII. What Is Your Reason For Smoking?

(Verbatim)

1. I started smoking because some of my friends smoke.
2. Habit.
3. Frustration. (Not entirely.)
4. I like it.
5. I enjoy it.
6. At times it does relax me.
7. Habit. No reason, can't stop.
8. I wish I knew.
9. I like to smoke after meals, reading, watching T.V. improves.
10. No reason.
11. Habit.
12. Something to do.
13. Probably more from habit than any other reason.
14. I find it a pleasant relaxation.
15. Habit.

Question VIII. Do You Feel Relaxed After Smoking?

(Verbatim)

1. Just average.
2. While smoking.
3. It depends.
4. Yes.
5. Yes.
6. Yes.
7. I guess.
8. Imagination mostly.
9. Yes, I really need to smoke.
10. No.
11. No.
12. No.
13. At times.
14. Yes.
15. Yes.

Question IX. Do You Usually Smoke More Alone, Or With
Someone Else?

(Verbatim)

1. About the same.
2. About equal.
3. It all depends.
4. It doesn't make any difference.
5. Usually more alone, but enjoy smoking with someone.
6. With someone else.
7. Makes no difference.
8. With someone else.
9. Either way.
10. Alone mostly.
11. No difference.
12. Even.
13. I think it would be about the same.
14. When I am alone.
15. With someone else.

APPENDIX II

DATA OF BLOOD PRESSURE AND PULSE RATE FOR EXPERIMENTAL GROUP

RAW SCORES

	Blood Pressure		Pulse	No	Yes - No
	Before	After			
1.	95-50---	85-50	64--68	B	X
	95-50---	85-50	68--68	A	X
	95-50---	95-50	64--68	C	X
2.	100-60---	110-80	84--88	A	X
	120-70---	120-70	84--80	C	X
	110-70---	110-80	80--84	B	X
3.	100-60---	100-70	84--88	C	X
	90-60---	100-70	72--68	A	X
	100-60---	90-60	84--76	B	X
4.	140-85---	130-80	76--80	B	X
	130-85---	125-80	84--84	C	X
	130-80---	130-80	84--80	A	X
5.	110-60---	110-50	72--80	A	X
	110-60---	90-70	72--76	C	X
	90-70---	100-70	72--76	B	X
6.	105-70---	110-75	66--68	B	X
	100-70---	105-60	64--68	A	X
	105-75---	110-80	64--66	C	X

RAW SCORES

	Blood Pressure		Pulse	No	Yes - No	
	Before	After				
7.	140-80---	135-90	84--84	C		X
	100-70---	110-75	68--76	A		X
	140-80---	130-80	84--76	B		X
8.	150-70---	150-60	72--88	A	X	
	120-70---	110-80	84--80	C		X
	120-80---	110-80	76--80	B		X
9.	100-50---	100-70	84--96	B		X
	100-90---	110-70	92--96	C		X
	105-90---	100-70	94--96	A		X
10.	105-70---	105-65	60--40	C		X
	100-60---	90-70	60--64	B		X
	105-70---	110-70	60--64	A		X
11.	105-80---	105-65	68--68	B		X
	100-70---	100-70	84--84	C		X
	100-70---	100-70	84--84	A		X
12.	120-80---	110-80	72--80	A		X
	110-90---	120-85	84--76	C		X
	120-70---	110-80	88--72	B		X

RAW SCORES

	Blood Pressure		Pulse	No	Yes - No	
	Before	After				
13.	110-85---	110-70	76--76	C		X
	120-70---	110-70	72--72	B	X	
	110-80---	105-70	76--64	A		X
14.	80-40---	90-20	84--84	A		X
	90-20---	70-20	72--80	B		X
	80-40---	80-30	84--82	C		X
15.	185-110--	190-135	80--80	B		X
	190-100--	190-120	84--76	A		X
	185-105--	190-180	80--78	C		X