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Cigarette smoking as a secondary source of drive and its effect on perception.

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CIGARETTE SMOKING AS A SECONDARY SOURCE OF DRIVE

AND

ITS EFFECT ON PERCEPTION

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ABSTRACT

This study was an attempt to investigate the effect of a deprivation of cigarette smoking on the Tachistoscopic Recognition Thresholds of a series of smoking and non-smoking pictures.

The experimental group consisted of 32 Ss assigned to deprivation levels ranging from zero to three hours. The stimulus pictures consisted of ten outline drawings of objects such as a cigarette lighter, pipe, coffee percolator, and a fountain pen, five of which were related to smoking. The pictures were exposed in a mirror tachistoscope, and the thresholds were measured by minimum flash duration.

Analyses of variance showed no statistically significant evidence of the operation of a drive resulting from a deprivation of cigarette smoking.

PREFACE

This study began as a result of my interest in the field of motivation and perception. The work of R. S. Lazarus served as a source for the historical background and for the methodology of the present study.

The author wishes to express his deep appreciation to Dr. A. A. Smith for his direction and guidance, which made the execution of this study possible. He is also indebted to Brother R. Philip, FSC, Ph.D., and Rev. C. P. Crowley, CSB, Ph.D., for their contributions as readers. Finally, he expresses his gratitude to the subjects, who showed remarkable interest and cooperation while participating in the study.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

For the past three decades, studies concerning the effect of motivational variables on perception have been carried out in considerable numbers. This field of investigation has become known as "The New Look in Perception". (Dember, 1960, p. 306). Within this area there has been evidence obtained by various methods of experimentation, which does suggest that a relationship exists between need or drive states and various measures of perceptual behaviour.

These motivational variables appear to effect changes in the frequency, latency and correctness of the S's overt responses to particular stimuli. These overt responses being a measure of one's perceptual behaviour, are considered indicative of the effects of motivational variables which may be operating, and thereby influencing the S's perception. Brown (1961, p. 324) says, "Inasmuch as perception is often defined in terms of the subject's linguistic responses, a motivational variable may be said to have affected perception when its introduction leads to changes in the kinds or frequencies of linguistic responses exhibited by subjects in so-called perceptual experiments".

The stimuli employed in the perception experiments have been limited mainly to those of a visual or auditory nature. However, the motivational variables are derived from various sources. Brown (1961, p. 61) prefers to speak of

"primary and secondary sources of drive". He makes the distinction in these two sources of drive in the following manner:

> Broadly speaking, primary motivational variables are those that produce their effects through the action of inherited bodily mechanisms. When environmental conditions are altered in any variety of ways, the physiological mechanisms of the organism even in the absence of opportunities to learn, tend to react in a corrective manner. At such times the organism is likely to behave as though motivated. The environmental changes or variables leading to these effects are called primary because they appear early in the developmental and phylogenetic sequences, not because they are necessarily more important than those labeled secondary.

Some variables considered to have primary motivational effects are a deprivation of food, of air and of water, and also deviations from the optimal levels of temperature and humidity. Some authors consider the withholding of opportunity to play, to be active, or to explore, sufficient to be classified as primary motivational variables.

With reference to motivational variables considered to be secondary in nature, Brown (1961, p. 62) makes the following observation:

> The secondary sources of drive differ from their counterparts in that their efficacy as motivators rests largely upon learning. Specifically, if an individual has acquired a tendency to make a certain response to a particular environmental situation, the elicitation of that response may have motivational consequences.

Examples of learned or acquired drives are conditioned fear and, also, anxiety-arousing circumstances introduced by E.

This experimental study is concerned with cigarette smoking, a learned response, acting as a secondary source of drive. The main hypothesis is that a deprivation of cigarette smoking will function as a motivational variable

and thereby have an effect on the thresholds obtained from a series of pictures, a number of which are presumably related to the smoking drive, and an equal number not related to the drive.

Experiments in Hunger and Perception

During the past three decades there has been considerable research undertaken, in an effort to clarify to a degree the interrelationship of need and perception. Since the topic of this research has not been explored prior to this time, there is no literature available to make direct reference to, in this survey. However, the studies of hunger and perception have a direct bearing on the nature of this project.

Sanford (1936) was perhaps the first to investigate the effects of hunger on the imaginal processes. He administered word association tests and picture interpretation tests to school children, both before and after lunch. He found that the food responses obtained on the pre-lunch tests exceeded the food responses obtained from the post-lunch tests by almost a two to one ratio.

Sanford (1937), using college students, administered a battery of five tests at the conclusion of a twenty-four hour fast period. He administered the same tests to control Ss at various intervals during the normal eating cycle. He found that the number of food responses increased as the deprivational interval increased up to twenty-four hours.

Atkinson and McClelland (1948) carried out an experiment on food deprivation and imaginative processes. Ss who were deprived of food for one, four, and sixteen hours, were asked to write short stories about cards taken

from Murray's Thematic Apperception Test. E found that, as the amount of hunger increased, so also did the percentage of Ss expressing food deprivation themes, and the number of characters in the stories expressing a need for food.

In the same year, McClelland and Atkinson (1948) carried out experimentation to show the effect of different intensities of hunger drive on perception. The Es projected blanks and smudges on a screen and gave different amounts of hints to the Ss. They found that, as hunger increased from one, four to sixteen hours, the average number of food responses increased. The projection of smudges as compared to blank images lowered this average.

Levine, Chein and Murphy (1942) studied the relation of the intensity of a need to the amount of perceptual distortion. The Ss were tested on the interpretation of a number of drawings (achromatic and chromatic) presented behind a ground glass screen so as to make them ambiguous. E instructed the Ss to fast for certain periods of time before the experimentation. They found that the number of food responses increased at three and six hours of deprivation and decreased at nine hours for achromatic drawings. The chromatic drawings, considered to be more ambiguous, showed an increase at three hours and a decrease at six and nine hours.

Brozek, Guetzkow, and Baldwin (1944) conducted a study of semi-starvation. Thirty-six Ss were subjected to a semi-starvation diet for twenty-four weeks. It was found that a preoccupation with thoughts of food, and matters such as cooking did exist. The only positive result obtained from a battery of psychological tests administered to the experimental group was that they made

significantly more uncommon responses to food words of a word association test than did the group of non-hungry control Ss.

Wispe and Drambarean (1953) conducted an experiment in which the Ss, who had been without food for periods from one to twenty-four hours, were asked to identify words presented tachistoscopically. It was concluded that need-related words have lower Recognition Thresholds than neutral words.

Taylor (1956) suggested that these results were due to attentive factors rather than to any real effects of drive on perception. In an experiment very similar to that of Wispe and Drambarean, she varied the Ss' physiological need and also their set to expect food-related words. She found that Recognition Thresholds for deprived Ss did not differ significantly from the Thresholds obtained from control Ss. But Ss who were set to expect food-related words did have lower Recognition Thresholds than the control group.

Lazarus, Yousem and Arenberg (1953) conducted two experiments which are of prime importance to the present research project. In the first study, photographs of common food objects, along with non-food objects, were presented tachistoscopically at a constant exposure time with variable illumination. It was found that the Recognition Thresholds for food versus non-food items varied significantly with the degree of deprivation. In the second experiment the Ss were forced to make their guesses from a list of objects which was present before them at all times. No relationship was found between hunger and Recognition Thresholds.

Experiments in Perceptual Defence

Closely parallel to the experiments cited above are those studies in the field of perceptual defence. The concept of perceptual defence has developed from the work of Postman, Bruner and McGinnies. Eriksen (1954) says, "The concept of perceptual defense was invoked as a principle to account for variations in recognition thresholds for tachistoscopically presented words."

Postman, Bruner and McGinnies (1948) demonstrated the concept of perceptual defence in a population of college students. The Ss were selected by using the Allport Vernon Study of Values, which yielded ratings in areas described as economic, theoretical, religious, social esthetic and political. There was a tendency for Ss to be more sensitive to words having a high value rating and less sensitive to words having a low value rating.

McGinnies (1949) illustrated perceptual defence on an autonomic level, and also by using Recognition Thresholds. He measured for the S's Galvanic Skin Response and also the Recognition Thresholds for a series of seventeen words, six of which were "taboo" and the rest neutral. The study indicated positive results in favour of the concept of perceptual defence, through changes in both the autonomic responses and the Recognition Thresholds for these "taboo" words.

McGinnies (1948) says:

> The findings are interpreted as representing conditioned avoidance of verbal symbols having an unpleasant meaning to the observer. The stimulus word serves as a cue to deeply imbedded anxiety which is revealed in autonomic reactivity as measured by the GSR. Avoidance of further anxiety is contemporaneously aroused in the form of perceptual defence against the recognition of the object.

Howes and Solomon (1950) argued that the reason for higher thresholds for "taboo" words could partially be accounted for, if account were taken of the frequency with which the individual had seen, pronounced, and used these words in the past.

Lazarus and McCleary (1951) also demonstrated perceptual defence on the autonomic level. They called this new phenomenon "subception". They paired five of ten nonsense syllables with shock and presented them tachistoscopically at near threshold levels. From an analysis of their GSR data, Lazarus and McCleary concluded that even when subjects were unable to make verbal identifications of the stimulus, autonomic discriminations were possible.

The examples of research cited above are considered to be the main experiments in the field of hunger and perception, and also in the field of perceptual defence. All of these studies seem to indicate a definite relationship between need and drive states and recognition of stimuli connected to these states.

Purpose of the Present Experiment

This experiment is an endeavour to obtain information concerning the relationship between motivational variables and perception. The motivational variable is cigarette smoking, a learned response, acting as a secondary source of drive. The measure of perceptual behaviour is the Naming and the Recognition Thresholds obtained by the tachistoscopic presentation of a series of pictures, a number of which are related to the smoking drive and an equal number, not related to the drive. The relationship proposed for examination is the effect of four periods of deprivation on a definite measure of perceptual behaviour.

CHAPTER II

METHODOLOGY AND PROCEDURE

Task Materials

The task materials used in this study were a series of twelve pictures, each of which was constructed in the following manner.

The pictures were tracings in black pencil on white bond paper. Each tracing was covered by a single sheet of white bond paper in order to make the contrast throughout the entire series uniform. Each picture was mounted on a sheet of white bristol board (8-1/2" x 11") and also framed in white bristol board. This frame was a square (5-1/4" x 5-1/4") which allowed every picture to be centrally situated. Staples were used to fasten the mounting, the two sheets of bond paper, and the frame into one complete unit.

Twelve pictures constructed as above were the visual stimuli for the experiment. Two of these pictures were used for demonstration purposes; the other ten were the actual experimental pictures. The first demonstration picture was a wrist watch, which was shown to S during the final instructions immediately preceding the experimental session. The second demonstration picture was a partially filled bottle, which was shown to S as a practice picture, just before those in the experimental series.

The experimental pictures were ten in number and in two classes: smoking pictures (those considered directly connected to the learned response,

smoking). The smoking pictures were as follows:

1. Open cigarette lighter, Zippo type.
2. Open package of cigarettes.
3. A hand holding a burning cigarette, with smoke escaping from it.
4. A single filter tip cigarette with smoke escaping from it.
5. A curved stem pipe with tobacco in it.

The non-smoking picutres were:

1. An electric coffee percolator.
2. A man's left shoe.
3. A fountain pen.
4. An electric iron.
5. A man's hat, homberg type.

Experimental Apparatus

The stimulus cards were exposed in a standard Gerbrands mirror tachistoscope. Exposure times could be varied from 0.01 second to 1.00 second in steps of 0.01 second. Preliminary trials using the full brightness of the instrument yielded thresholds in the neighborhood of 0.04 second, too low to permit any measurable reduction under the proposed drive. The illumination was therefore reduced by placing seven sheets of white bond paper (9-3/4 lb.) over each of the four light sources.

A screen of white bristol board was attached to the front section of the tachistoscope, in order to eliminate any possibility of the experimental pictures

being seen by Ss prior to their tachistoscopic exposure.

Two open packages of cigarettes (straights and filters) were present on the table in the testing room, along with a package of matches and an ash tray. These articles were in view at all times except during the actual experimental session.

Subjects

Ss for this experiment were college students selected on the basis of a questionnaire administered to them. Ss for the experimental group were selected with regard to the following categories:

1. Sex: all male.
2. Age: 18 to 26 years.
3. Cigarette smoking: 15 to 25 cigarettes per day.
4. Length of time S had been smoking: a minimum of one year.

The thirty-two Ss in the main experimental group were assigned to four deprivation schedules of zero, one, two and three hours by a procedure which attempted to meet both the individual's convenience and the criterion of random assignment. Each S was consulted the evening prior to the experimental day, and allowed to choose the hour which suited him best. After he had chosen this time, he was asked to report for brief preliminary instructions either at the zero hour, or one, two or three hours in advance. Random selection of these intervals ensured the necessary random assignment of Ss to deprivation schedules.

Procedure

A pilot study of eight Ss (non-smokers) was carried out in order to obtain the best operational procedure before the testing of the experimental group began. The preliminary instructions covered the following three points:

First, that each person was participating in an experiment concerning visual perception.

Second, each S was asked to smoke one cigarette at that time. (This was supplied by E.)

Third, each S was asked not to smoke again, until after the experimental session had been completed, which would take place at the time selected previously, and which would last approximately twenty minutes. Ss assigned to the zero-hour group were taken for final testing immediately after the preliminary instructions.

During the experimental sessions the following procedure was carried out:

Each S was taken into the testing room and seated comfortably before the apparatus. He was then told that he would be allowed to smoke immediately after the testing was completed. It was indicated that he would be allowed to smoke one of two brands on the table or, if he preferred, one of his own.

A set of standard instructions was read to the S, and E answered any questions arising from these instructions. A practice picture was then shown to S so that he would become accustomed to the procedure before the experimental pictures were presented. Each S was asked to keep his head close to the eyepiece of the tachistoscope during the entire session, in order to prevent any

effects which might be caused by the differences between the illumination of the testing room, and the relatively dim exposure fields of the tachistoscope.

The experimental pictures were presented in random order, with the restriction that no two pictures of the same class would be shown consecutively. Thus the smoking pictures occupied the odd series positions from one to ten, and the non-smoking pictures, the even positions in this series.

An ascending method of limits was used in the presentation of each picture. The beginning exposure rate was .01 second, which was increased, in .01 second increments, on each exposure. Responses were scored as correct or incorrect until a criterion level of three correct consecutive identifications was reached. Each picture was presented and scored in this manner.

After the testing session, S was given a cigarette from one of the two packages, or allowed to smoke one of his own. He was thanked for his cooperation and asked not to reveal anything about the nature of the project to any other person.

CHAPTER III

PRESENTATION AND ANALYSIS OF RESULTS

Treatment of Data

For each picture, two scores were obtained. The first was the Naming Score: the first response in which S gave a name to the stimulus, whether this name was correct or not. The second score was the actual Recognition Score: the initial response in a group of three consecutive correct identifications. In a majority of the cases, these two scores were the same, because of the accuracy of the initial Naming Response.

The data collected in this experiment were analyzed in the following manner. First, the pilot study of eight non-smokers was considered. For this group of Ss only the Recognition Thresholds were tabulated. Recognition Thresholds, standard deviations, and standard errors of the means, for smoking and non-smoking pictures were calculated.

Thresholds were measured for both smoking and non-smoking pictures, using three selected pictures and also all five pictures. This measure was taken because the recognition of some pictures in each class presented difficulty for a number of the smoking Ss. Since these Ss failed to recognize these difficult stimuli, either in part or entirely, only the Naming Scores for these pictures were used. This failure to recognize the difficult stimuli was not present in the pilot study of non-smokers.

The data collected from the four experimental categories of deprivation

was treated in the same manner. The Naming Thresholds and the Recognition Thresholds were calculated for both the three selected pictures and all five pictures of the smoking and non-smoking classes. The standard deviations and standard errors of the means were also calculated for the above thresholds.

The overall threshold was computed for the non-smokers and for the smokers in the four deprivation groups. The overall threshold value was obtained by combining the thresholds obtained for the smoking pictures with the thresholds obtained for the non-smoking pictures.

Results

The results obtained from the pilot study of eight non-smokers are shown in Table 1. Only the Recognition Thresholds were measured for this group. The Recognition Thresholds for three selected pictures and all five pictures of the smoking and non-smoking classes are given for each S. The mean Recognition Thresholds for the group along with the standard deviations and standard errors of the means, are also presented. The mean Recognition Thresholds in the pilot study indicated that the non-smoking pictures were perceived more easily than the smoking pictures. This fact holds for thresholds computed from the three selected pictures as well as for thresholds computed using all five pictures in each class.

The comparison of thresholds computed from three selected pictures with thresholds computed from all five pictures demonstrates a lower threshold value for both the smoking and the non-smoking class of pictures. This verifies the presence of pictures in each class that are more difficult to perceive than others of the same class.

Table 1

Recognition Thresholds for Non-Smoking Subjects

All Pictures		Selected Pictures	
SP	NP	SP	NP
10.80	9.60	10.33	9.00
12/40	12.40	10.00	11.00
10.60	9.60	9.66	9.33
14.00	16.00	15.00	12.66
13.50	12.20	12.00	12.00
12.80	9.80	11.33	10.33
8.80	8.40	8.33	8.33
10.40	11.00	9.66	8.66
Means			
11.62	11.13	10.79	10.16
Standard Deviations			
1.67	1.84	1.90	1.50
Standard Errors of the Means			
.59	.65	.67	.53

The Naming Thresholds for smoking and non-smoking pictures, computed for each S in each deprivation group, are presented in Table 2. The mean Naming Thresholds along with the standard deviations and standard errors of the means for each deprivation group are also shown. These Naming Thresholds were computed using scores obtained from all five pictures in both the smoking and non-smoking classes.

The trend of these group data is shown in Fig. 1. An analysis of variance was carried out on the Naming Threshold data. This analysis, summarized in Table 3, failed to reveal any differences significant at the 5% level between deprivation groups and between smoking and non-smoking pictures.

The Naming Thresholds computed for three selected pictures in both the smoking and non-smoking classes are shown in Table 4. The standard deviations and the standard errors of the means are also presented. In all cases the mean Naming Thresholds for three selected pictures in each class are lower than those obtained using all five pictures in each class. This again gives evidence concerning the difficulty of perceiving particular pictures within each class of stimuli. Fig. 2 presents the same data in graphic form.

Estimates using the standard error of the means for each deprivation group were taken. These estimates showed marked variability within the groups, and a further analysis of variance was not considered necessary.

The Recognition Thresholds for all five smoking and all five non-smoking pictures are presented for each individual S in Table 5. The standard deviations and standard errors of the means are also presented. The mean Recognition Thresholds by deprivation intervals are plotted in Fig. 3.

Table 2

Naming Thresholds for All Pictures

0-hr		1-hr		2-hr		3-hr	
SP	NP	SP	NP	SP	NP	SP	NP
10.20	11.80	15.00	12.60	14.80	11.50	14.60	15.00
9.40	10.40	9.80	11.40	10.40	10.60	10.00	11.20
12.60	10.80	9.80	8.50	13.80	11.40	11.20	10.20
10.60	10.80	13.20	12.20	13.50	14.50	16.00	13.60
12.20	10.80	18.00	15.00	11.20	7.40	9.50	10.00
16.40	16.00	13.40	12.80	16.00	11.60	14.80	12.40
13.00	12.40	10.40	9.80	9.80	11.00	17.25	14.80
13.20	12.00	12.20	12.60	13.00	11.80	14.60	12.20
Means							
12.20	11.87	12.72	11.86	12.81	11.22	13.49	12.42
Standard Deviations							
3.09	1.75	1.29	2.03	2.36	1.97	1.72	2.07
Standard Error of the Means							
1.09	.62	.46	.71	.83	.70	.61	.73

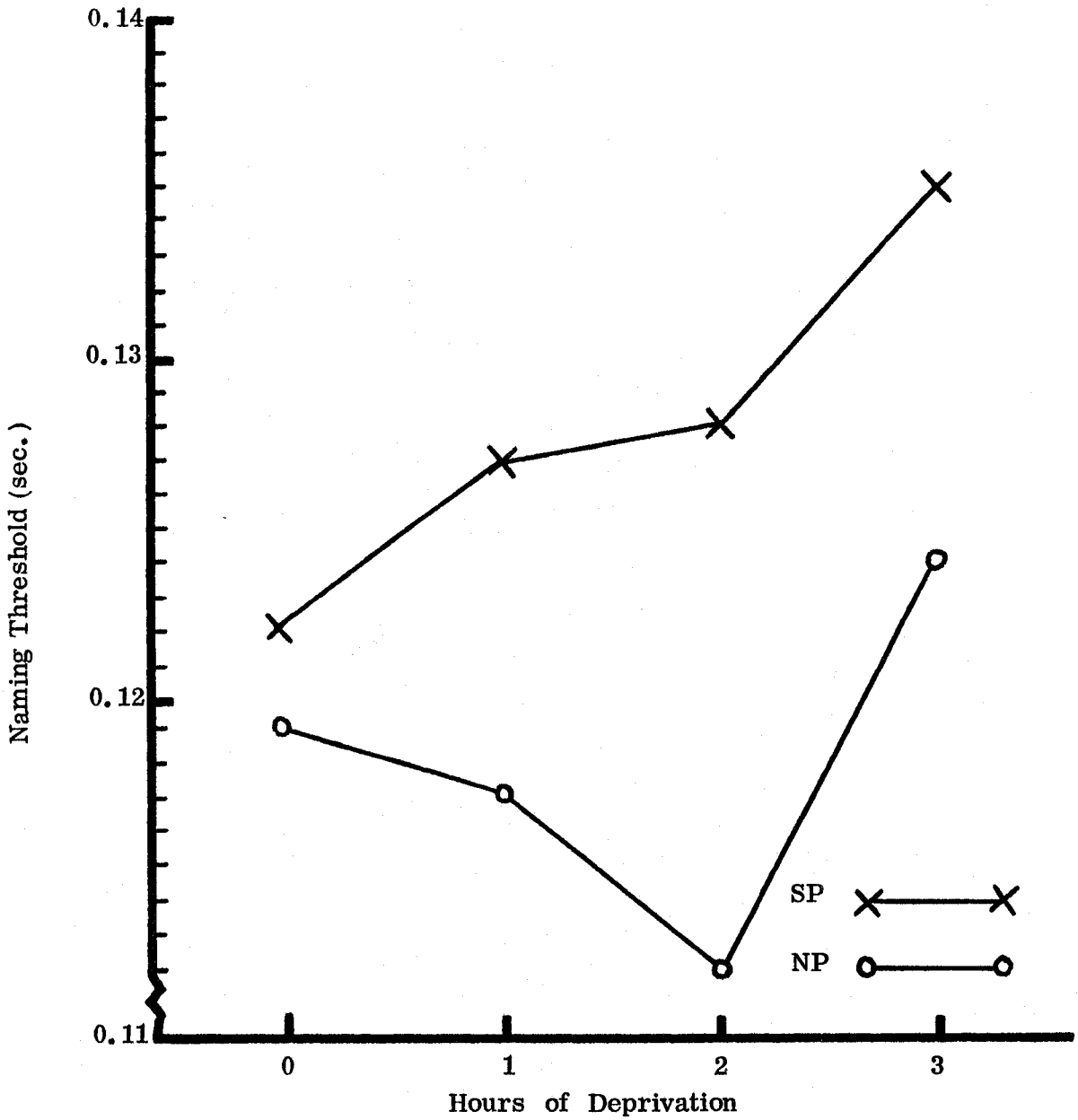

Fig. 1. Mean Naming Thresholds at four deprivation levels, for all pictures.

Table 3

Analysis of Variance of Naming Thresholds for Two Classes of Pictures at Four Deprivation Levels

Source	Sum of Squares	df	F-Ratio
Individuals	96.3748	28	
Deprivation (D)	6.8117	3	.65966
Picture Classes (P)	14.6848	1	.36920
D x P Interaction	5.6057	3	.28158
Remainder	185.8042	28	
Total	309.1460	63	

Table 4

Naming Thresholds for Selected Pictures

0-hr		1-hr		2-hr		3-hr	
SP	NP	SP	NP	SP	NP	SP	NP
8.33	10.66	13.00	10.00	14.33	11.00	13.00	13.66
8.33	9.33	9.00	10.33	10.66	9.66	10.00	9.66
10.33	10.00	7.66	9.00	10.33	9.33	11.00	9.33
10.33	11.33	13.33	10.00	13.33	11.66	12.33	11.66
11.33	9.66	15.00	13.66	10.33	7.33	9.33	9.00
13.33	14.00	12.66	11.66	10.33	9.66	14.33	11.66
11.33	12.00	9.33	9.33	9.00	8.33	16.33	13.33
13.00	11.66	11.33	12.00	12.33	11.00	12.00	10.33
Means							
10.79	11.08	11.42	10.75	11.33	9.75	12.29	11.08
Standard Deviations							
1.75	1.42	2.37	1.47	1.72	1.36	2.14	1.67
Standard Error of the Means							
.62	.50	.84	.52	.61	.48	.76	.59

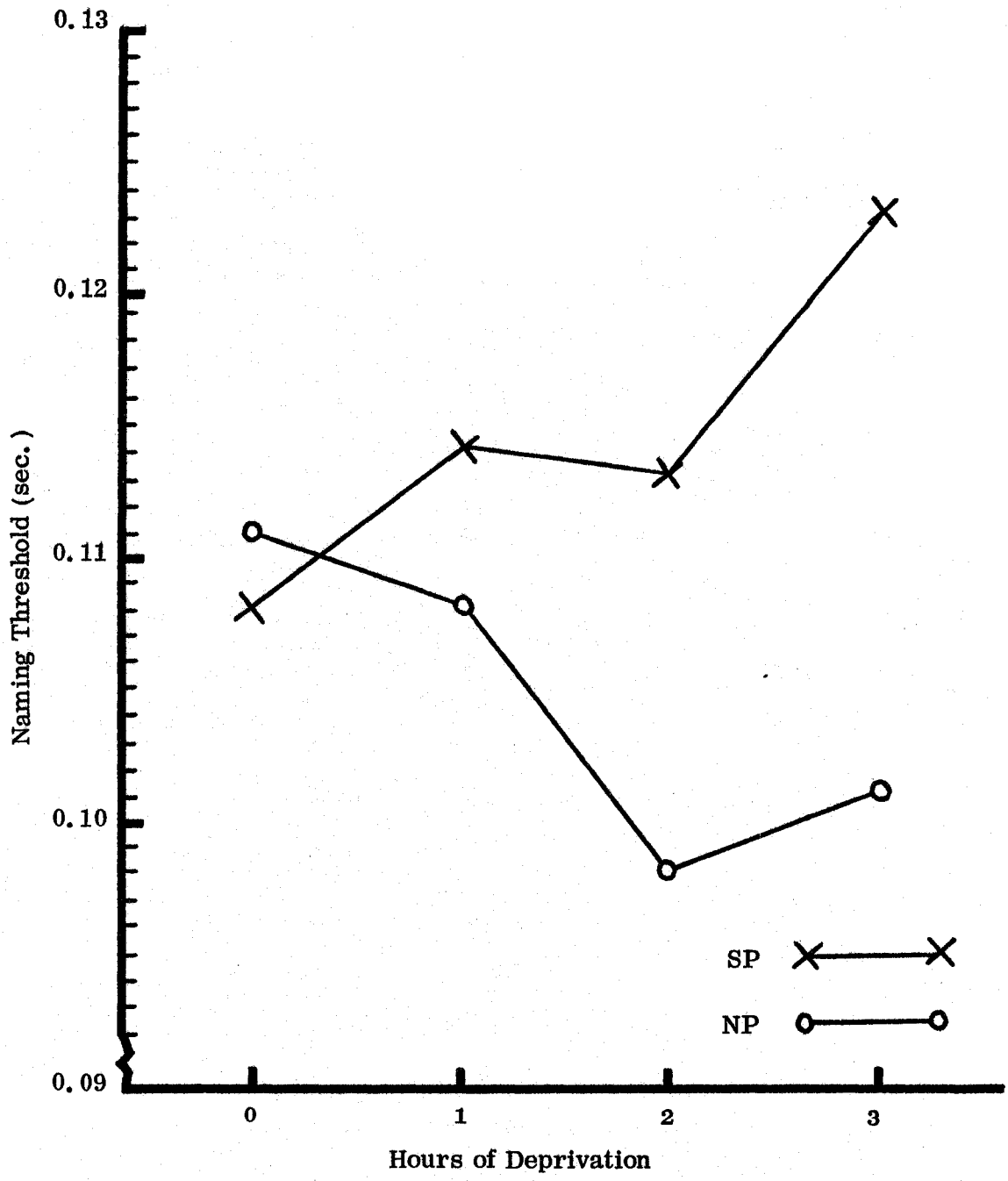

Fig. 2. Mean Naming Thresholds at four deprivation levels for selected pictures.

Table 5

Recognition Thresholds for All Pictures

0-hr		1-hr		2-hr		3-hr	
SP	NP	SP	NP	SP	NP	SP	NP
9.75	11.80	13.00	12.60	17.80	11.50	18.60	17.00
9.50	10.40	9.80	11.60	12.75	12.60	15.20	11.80
15.80	10.80	9.80	8.50	15.40	11.40	17.00	11.20
10.60	10.80	22.00	15.00	13.33	14.50	16.20	13.60
15.80	11.80	19.00	15.00	18.33	7.40	12.20	10.00
13.33	16.00	18.00	12.80	13.75	13.80	16.20	12.40
18.20	13.80	14.80	10.80	11.20	12.00	16.33	14.80
15.80	12.00	16.75	12.25	13.00	12.00	15.20	12.20
Means							
13.60	12.18	15.39	12.32	14.45	11.90	15.87	12.88
Standard Deviations							
3.09	1.75	1.29	2.00	2.36	1.98	1.72	2.07
Standard Error of the Means							
1.09	.62	.46	.71	.84	.70	.61	.73

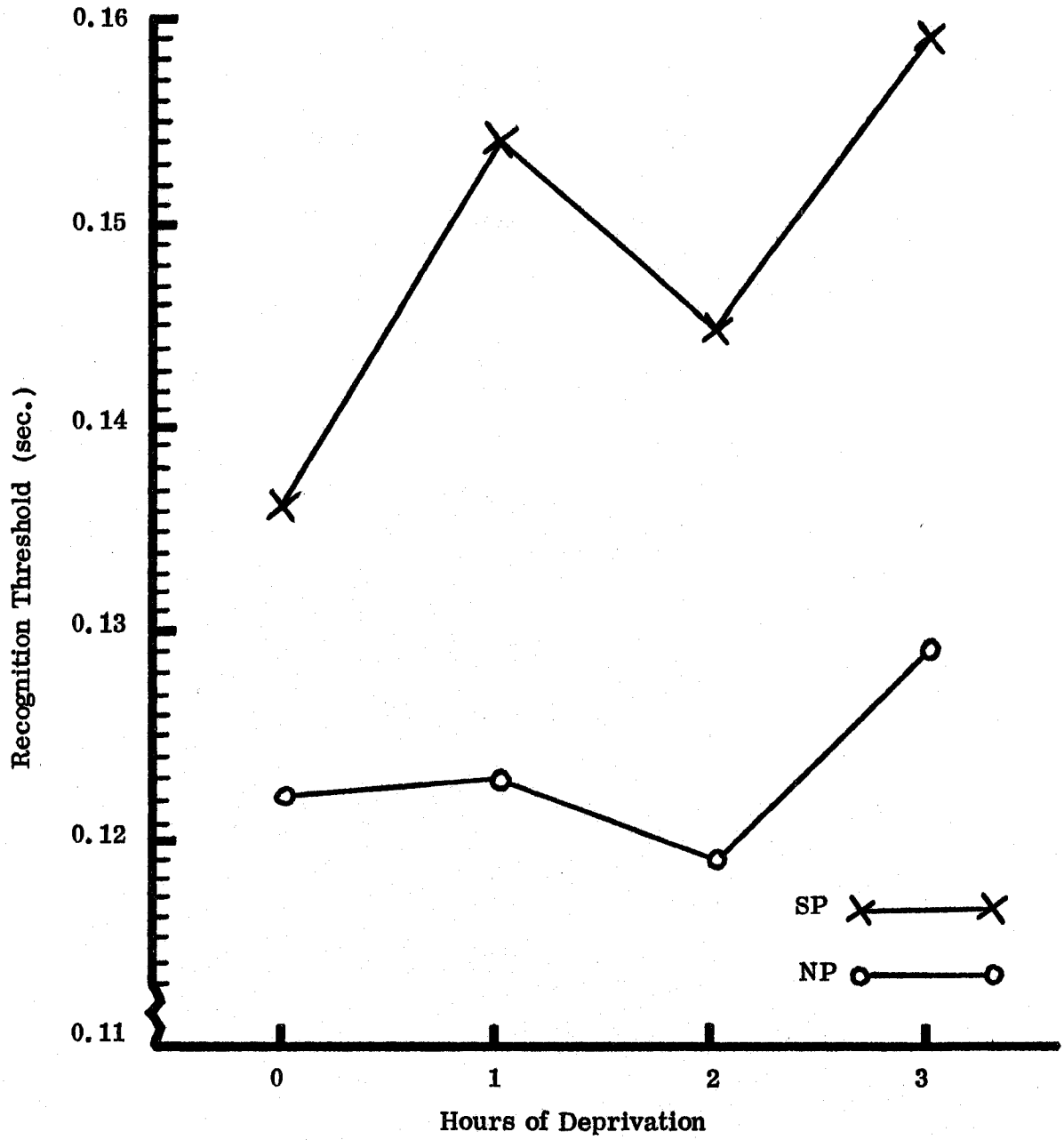

Fig. 3. Mean Recognition Thresholds at four deprivation levels for all pictures.

A three-way analysis of variance was carried out on the Recognition Threshold's data, and Table 6 presents a summary of this analysis.

Table 6

Analysis of Variance of Recognition Thresholds for Two Classes of Pictures at Four Deprivation Levels

Source	Sum of Squares	df	F-Ratio
Individuals	266.4109	28	
Deprivation (D)	21.5752	3	.75585
Pictures Classes (P)	100.6761	1	10.58114 *
D x P Interaction	6.9378	3	.48239
Remainder	134.2313	28	
Total	529.8318	63	

* Significant between .01 and .001 level

The analysis reveals a significance in the differences between Recognition Thresholds for smoking and non-smoking pictures, but no significant difference can be attributed to the levels of deprivation. The thresholds for smoking pictures are higher than those obtained for the non-smoking pictures, thus indicating that the pictures of the smoking class were more difficult to perceive.

The Recognition Thresholds for three selected smoking, and three selected non-smoking pictures are presented in Table 7. The standard deviations and the standard errors of the means are also presented. Mean Recognition Thresholds for deprivation levels are plotted in Fig. 4.

Table 7

Recognition Thresholds for Selected Pictures

0-hr		1-hr		2-hr		3-hr	
SP	NP	SP	NP	SP	NP	SP	NP
8.33	10.66	13.00	10.00	15.66	11.00	15.00	15.66
8.33	9.33	13.00	10.33	13.50	13.00	13.66	10.66
10.33	10.00	7.66	9.00	10.33	9.33	15.66	9.33
10.33	11.33	18.50	14.00	13.33	11.50	12.33	11.66
17.33	11.33	16.00	13.66	8.50	11.00	9.33	9.00
13.33	14.00	16.00	11.66	10.33	9.66	14.33	11.66
17.66	13.33	12.66	9.66	10.66	11.00	16.33	13.33
13.00	11.66	16.00	11.00	12.33	11.00	12.00	10.33
Means							
12.33	11.46	13.60	11.16	11.83	10.81	13.50	11.45
Standard Deviations							
3.44	1.47	3.53	1.72	2.15	1.09	2.14	2.14
Standard Error of the Means							
1.21	.52	1.25	.61	.76	.39	.76	.76

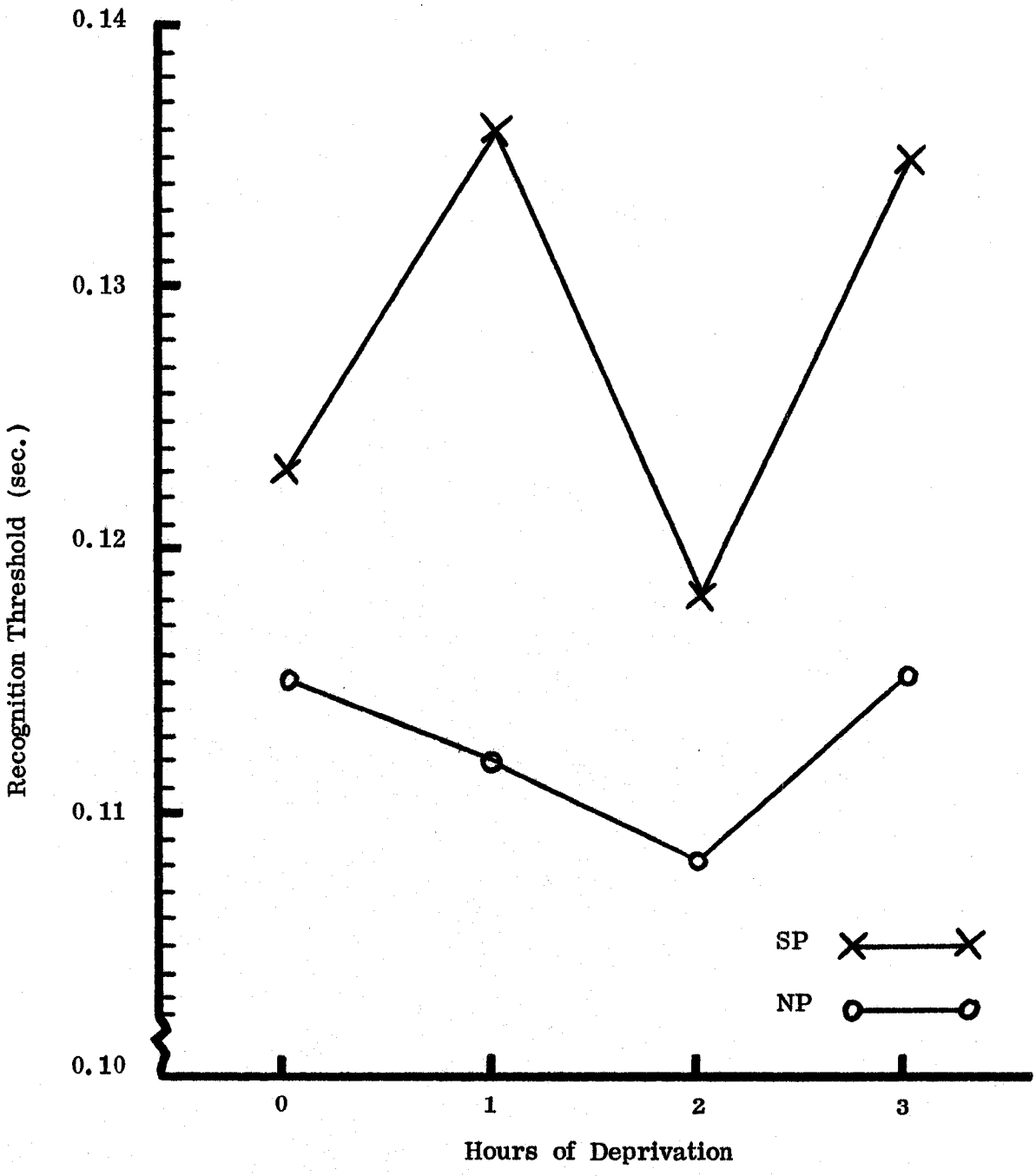

Fig. 4. Mean Recognition Thresholds at four deprivation levels for selected pictures.

The mean overall values for Naming and Recognition Thresholds are presented in Table 8. These values are given for non-smokers as well as for smokers in the four deprivation groups. The overall thresholds are plotted against the deprivation levels, as shown in Fig. 5 and Fig. 6.

Table 8

Naming and Recognition Thresholds at Four Deprivation Levels

Naming Thresholds based on ten experimental pictures			
0-hr	1-hr	2-hr	3-hr
12.04	12.29	12.02	12.96
Naming Thresholds based on six selected pictures			
0-hr	1-hr	2-hr	3-hr
10.94	11.08	10.54	11.69
Recognition Thresholds based on ten experimental pictures			
0-hr	1-hr	2-hr	3-hr
12.89	13.86	13.17	14.37
Recognition Thresholds based on six selected pictures			
0-hr	1-hr	2-hr	3-hr
11.89	12.38	11.32	12.52

Note: Recognition Thresholds for non-smoking subjects, based on ten and six pictures, were 11.39 and 10.48 respectively.

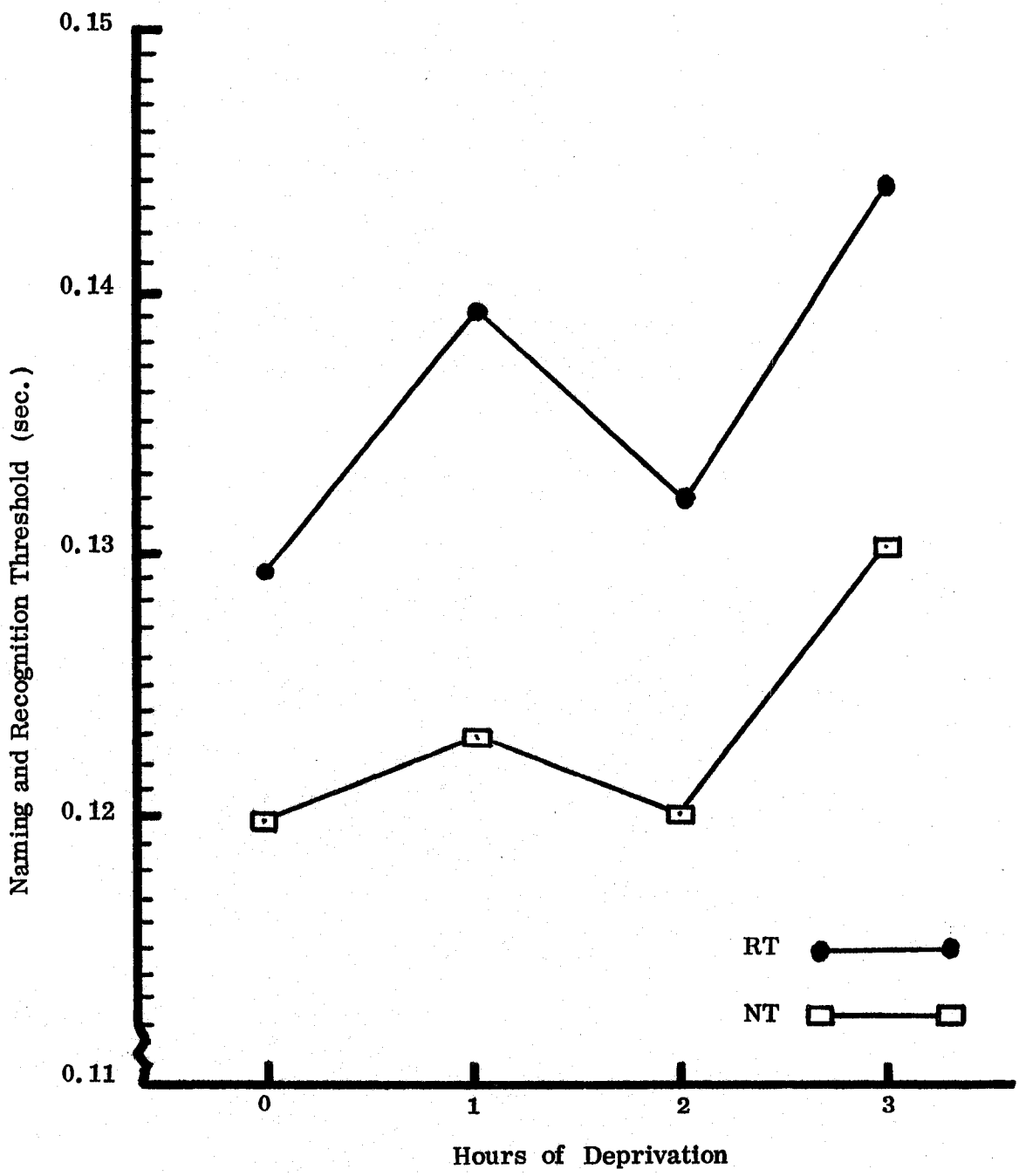

Fig. 5. Mean Naming and Recognition Thresholds at four deprivation levels for all pictures.

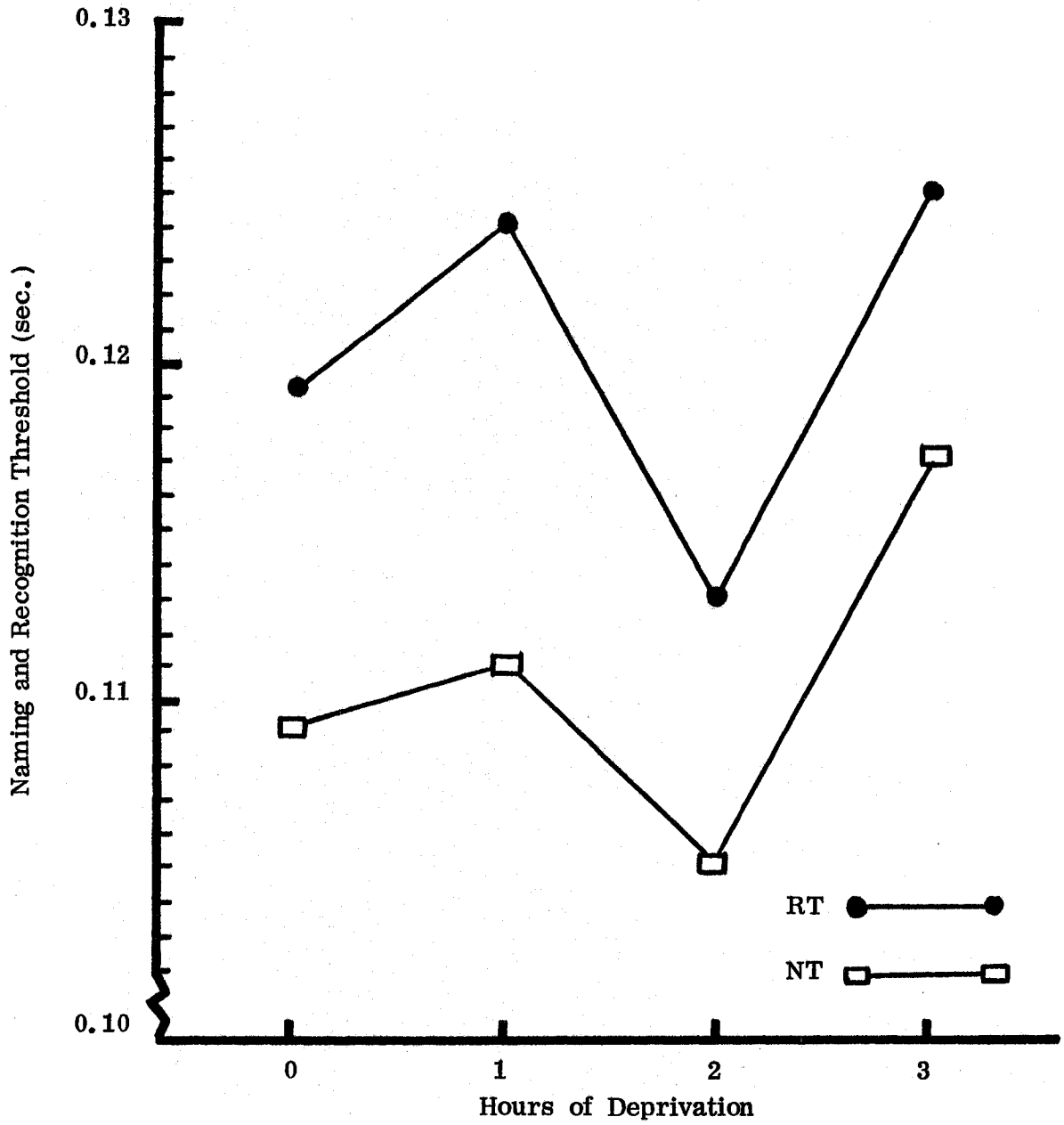

Fig. 6. Mean Naming and Recognition Thresholds at four deprivation levels for selected pictures.

CHAPTER IV

DISCUSSION

At the outset of this experiment it was hypothesized that cigarette smoking, a learned response, would function as motivational variable or source of drive, and thereby influence the Recognition Thresholds obtained from both the smoking and the non-smoking classes of pictures. The source of drive, cigarette smoking, should, by hpothesis, influence the thresholds in a fashion predicted by Hull's learning theory. Brown applies this concept to perceptual behaviour.

In the present situation, Hull's D is a function of the deprivation levels. This D is assumed to increase as the deprivation level is increased from one to three hours. The habit strength available for responding to the drive related stimuli is a function of the associative tendencies connected to the response as a result of previous learning and repetition of the response as a result of previous learning and repetition of the response. Other variables, such as the number of cigarettes smoked per day, and the length of time S had been smoking, helped to increase the habit strength of the response. The sum total of these components gives a measure of the habit strength.

The combination of drive level with habit strength produces a measurable response to a stimulus. If the level of drive is varied, it seems reasonable to expect the responses to a particular class of stimuli to increase or decrease

accordingly, in some predictable fashion. If the drive level were held constant and the habit strength varied, the responses would also be expected to vary in some predictable fashion.

In this study, the drive level was varied and the habit strength was supposedly held constant for all Ss. The data collected showed no significant differences between the thresholds representing the various drive levels. An examination of the data for Recognition Thresholds for all five pictures shows a significant difference between Recognition Thresholds for smoking pictures as opposed to non-smoking pictures. The significantly higher Recognition Thresholds for the smoking pictures indicated that they were more difficult to perceive than the non-smoking pictures. One cannot attribute these higher thresholds to the effects of deprivation levels, because no evidence to substantiate such a claim is present in the data, since the analysis of variance indicated no significant differences between the deprivation groups. There were no significant differences shown for the Naming and Recognition Thresholds, with respect to the two classes of stimuli, except for the case cited above. There are a number of possible reasons for such findings, but the following seem quite pertinent.

The stimuli used in this study were of two classes, those related to smoking, and those not related to this learned response. The five smoking pictures were selected from a population of smoking pictures. It is possible, due to the different Ss in each group, that these pictures did not have the same associative value for all concerned. Also the two types of pictures were not matched for ease of perception, as is shown by the differences in the thresholds of the non-smokers and the smokers at the zero-hour deprivation level. The fact that the

smoking pictures were more difficult to perceive is also demonstrated by the significant difference between the two classes of pictures in the case of the Recognition Thresholds computed for all five pictures of both classes.

The habit strength of the response must be considered. The stronger the habit strength, the greater the probability of a correct response. It follows that an S who lies in the maximum category, in both the number of cigarettes smoked per day, and the length of time smoking, should possess the greatest quantity of habit strength, which will have some influence on the response elicited by the stimulus. If the distribution of Ss with regard to this variable is not homogeneous, then another source of variation must be considered.

The perceptual ability of the four groups is another factor which might be controlled more precisely. The fact that some Ss are better than others with regard to perceptual ability, could be a significant source of variation between the deprivation groups.

Other factors, which might have some effect on the thresholds obtained, are variables such as food and water deprivation. Hull's D is a generalized drive increased by different amounts of smoking deprivation. This drive level could also be raised by a deprivation of food and water. Thus a S who had been deprived of food or water for a number of hours may be acting under these drives rather than under a smoking drive. These drives being primary in nature, could possibly be somewhat stronger than smoking drive, which is secondary in nature.

The combination of the above reasons could, in part, explain the lack of significant results in the present study, but in view of the trends that seem to be

present, more experimentation is warranted. A more precise control of the following variables would produce more reliable results in future studies of this nature.

The selection of stimuli and the selection of Ss are the main factors which might be controlled more accurately. With regard to stimuli, it will be necessary to select the experimental pictures for both the smoking and the non-smoking classes from a population of such pictures. This could be attained through a pilot study of non-smoking Ss, by selecting pictures for each class (smoking and non-smoking) with regard to their ease of perception. If this variable is equated for both classes of pictures, any deviations of the thresholds for smoking Ss, from these established thresholds, would be meaningful.

The perceptive ability of each individual S must be considered in the selection of Ss for the experimental groups. It is obvious that some Ss are better performers than others, in regard to tests where perception is employed. A preliminary experiment, which would allow E to rate the Ss with respect to their perceptive ability, would supply the necessary information. Ss could then be assigned to the various deprivation schedules, in order to ensure a homogeneous distribution of Ss throughout the deprivation groups. A factor which made this procedure somewhat impractical under the present circumstances, was the fact that it was necessary to give consideration to the times at which Ss were available for testing. The choice of the testing time, which S selected at his own convenience, placed certain limits on the deprivation group to which he could be assigned.

If such controls were established in the selection of Ss and stimuli, the thresholds, which represent the effect of smoking deprivation on perception, could be more reliably measured.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The present experiment was undertaken in order to acquire more information about the field of motivation and perception. The models for this study were those experiments in the area of hunger and perception, as well as those in the field of perceptual defence. A deprivation of cigarette smoking was chosen as the motivational variable, and the Naming and Recognition Thresholds measured tachistoscopically, were chosen as the measure of perceptual behaviour. These measures of perceptual behaviour were tachistoscopic thresholds obtained from two classes of pictures, one related to the smoking drive, and the other, not related to this drive.

The experimental group consisted of college students selected from information obtained on a questionnaire administered to them. There were eight Ss randomly assigned to each of four deprivation schedules which ranged from one to three hours in length. A pilot study of eight non-smoking Ss was completed before the testing of the experimental group commenced.

S was given preliminary instructions, and then taken for the final testing session, one, two or three hours later. If he was assigned to the zero-hour group, he was taken for the final testing immediately after the preliminary instruetions.

The final testing always took place in the same room. E read a set of standard instructions to S. The Naming and Recognition Thresholds were measured by the tachistoscopic presentation of ten achromatic pencil drawings (the experimental pictures). After the testing had been completed, S was given a cigarette.

The analysis of the data consisted of computing individual thresholds for both the smoking and the non-smoking pictures. The mean thresholds for each deprivation group were computed along with their standard deviations and the standard errors of the means. These computations were performed using thresholds obtained from all five experimental pictures, and from three selected smoking and non-smoking pictures in each class of stimuli. Three-way analyses of variance were computed for the Naming and Recognition Threshold data based on all five smoking pictures and all five non-smoking pictures.

The analysis of variance of the naming data yielded no significant results to confirm the experimental hypothesis. The analysis of variance for the recognition data yielded a significant difference between the two classes of stimuli. This finding gives further emphasis to the evidence that both classes of pictures were not equated for ease of perception.

Conclusions

There were no statistically significant trends present in the data collected. The reason for this fact could be attributed to a vew variables which were not entirely controlled. One variable is the method of selecting Ss. In addition to the present controls, Ss should be controlled for perceptual ability. A primary

study in which the Ss were rated for perceptual ability would enable E to have a homogeneous sample of Ss throughout the experimental groups.

Another variable which should be controlled more accurately, is the perceptual ease of the pictures in both classes of stimuli. If the thresholds obtained for non-smokers are equal for these two classes of stimuli, then any change resulting from the imposition of deprivation levels could be more clearly attributed to the effect of motivational variables on perception.

The final conclusion of this study is that more research should be undertaken in this facet of motivation and perception. The effects of a deprivation of cigarette smoking on perceptual behaviour could be more clearly demonstrated if the proper experimental controls were added to those present in this experiment.

APPENDIX A

Table 9

Recognition Scores for Each Picture in the Smoking and the Non-Smoking Class of Stimuli

0-Hour Deprivation Group

Smoking Pictures		Non-Smoking Pictures	
A	13.75	P	10.68
B	17.43	Q	14.63
C	8.75	R	11.63
D	16.00	S	11.88
E	15.75	T	11.50

1-Hour Deprivation Group

Smoking Pictures		Non-Smoking Pictures	
A	13.71	P	11.88
B	20.14	Q	15.71
C	12.00	R	9.86
D	15.60	S	13.50
E	14.50	T	11.63

2-Hour Deprivation Group

Smoking Pictures		Non-Smoking Pictures	
A	12.88	P	9.63
B	22.83	Q	16.83
C	10.25	R	10.71
D	14.83	S	12.50
E	12.50	T	10.63

3-Hour Deprivation Group

Smoking Pictures		Non-Smoking Pictures	
A	15.38	P	11.13
B	20.86	Q	17.13
C	11.75	R	10.88
D	18.83	S	12.88
E	13.63	T	12.38

Note. For the analysis of Selected Pictures the following were removed: Smoking pictures B, D; Non-Smoking pictures Q, S.

APPENDIX B

Table 10

Naming Scores for Each Picture in the Smoking and the Non-Smoking Class of Stimuli

0-Hour Deprivation Group

Smoking Pictures		Non-Smoking Pictures	
A	11.25	P	10.38
B	17.25	Q	14.63
C	8.75	R	11.38
D	11.38	S	11.50
E	12.38	T	11.50

1-Hour Deprivation Group

Smoking Pictures		Non-Smoking Pictures	
A	12.00	P	10.00
B	16.50	Q	14.86
C	9.13	R	10.75
D	12.57	S	13.00
E	13.13	T	11.50

2-Hour Deprivation Group

Smoking Pictures		Non-Smoking Pictures	
A	11.25	P	9.25
B	17.29	Q	14.83
C	9.63	R	9.75
D	13.25	S	12.50
E	12.13	T	10.25

3-Hour Deprivation Group

Smoking Pictures		Non-Smoking Pictures	
A	12.13	P	11.00
B	16.25	Q	16.00
C	11.75	R	10.63
D	14.66	S	12.88
E	13.00	T	11.63

Note. For the Analysis of Selected Pictures the following were removed: Smoking pictures B, D; Non-Smoking pictures Q, S.

APPENDIX C

QUESTIONNAIRE

Please print CIGARETTE SMOKING Please print

It will be greatly appreciated if each person would fill in the necessary information as accurately as possible.

NAME:_____
Surname Given names

AGE:_____ SEX:_____

ADDRESSES:

HOME:_____
Street City Province Phone No.

LOCAL:_____
Street City Province Phone No.

1. Do you smoke cigarettes?_____

2. How long have you been smoking cigarettes?_____
Years Months

3. How many cigarettes do you smoke every day?_____

4. What brand of cigarettes do you smoke? _____

5. Do you smoke "straights" or "filters"?_____

6. Do you inhale while smoking?_____

7. At present are you smoking more than usual?_____

8. Have you signed up for a Psychological Experiment yet?_____

If so, please indicate which one _____

THANK YOU VERY MUCH FOR YOUR COOPERATION.

M. A. Godin,
P. G. Student,
Psychology.

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