University of Massachusetts Amherst

An experimental study of repression.

Item Type	Thesis (Open Access)
Authors	Raphael, Ruth R.
DOI	10.7275/6871495
Download date	2026-03-11 04:07:25
Link to Item	https://hdl.handle.net/20.500.14394/45413

UMASS/AMHERST
31206601356084 4

AN EXPERIMENTAL STUDY OF REPRESSION

RAPHAEL · 1950

LD
3234
M268
1950
R217

AN EXPERIMENTAL STUDY OF REPRESSION

by

Ruth R. Raphael

THESIS SUBMITTED FOR THE DEGREE OF MASTER OF SCIENCE

UNIVERSITY OF MASSACHUSETTS

JUNE 1950

TABLE OF CONTENTS

JUL 18 1951 Gift

LIST OF ILLUSTRATIONS

INTRODUCTION AND LITERATURE REVIEW

Digitized by the Internet Archive
in 2014

https://archive.org/details/experimentalstud00raph

This experimental study is an attempt to establish a technique for analyzing repression. It is not novel in its purpose, as can be seen by the numerous attempts to establish such a technique which have been made during the past fifty years. It is, however, unique in its design, and presents an analysis of an active, removable repression, which previous studies failed to do. It concerns itself with a demonstration of the mechanism of repression and an analysis of the effect of relief of repression on subsequent problem solving.

Before beginning such an experimental study, it was necessary to agree upon a definition of the phenomenon. Many writers have contributed definitions of repression, referring respectively to such mechanisms as conflict, defense, inhibition, adjustment, resistance, rejection, and denial. One basic idea which is found in the majority of definitions is that repression is conceived as a direct function of an unconscious fear or unpleasant association. For example, Rosanoff (10) defines repression in the following way: "It is the psychic mechanism whereby ideas charged with painful emotion are relegated to the realm of the unconscious." Sadler (11) defines repression as "the unconscious rejection of perceptions and ideas because of

their painful or disagreeable content." White (17) quotes Freud as claiming that, "Strong forces which prevent the patient from remembering certain emotionally charged experiences and which now oppose the entry of the forgotten ideas into consciousness must have been responsible for their original banishment." Young (18) defines the process as "the exclusion of painful or unpleasant ideas from consciousness or from overt action."

This study will confine itself to the assumption that repression is a mechanism whereby an unconscious fear or unpleasant association acts as a direct force causing inability to utilize effectively the associated experience in subsequent situations.

A recent review by Zeller (19) cites many experimental studies which have been conducted to investigate the process of repression. One of the first examples given is a study done by Colgrave (1), in 1898, when he administered to a group of school children a questionnaire which contained the question, "Do you recall pleasant or unpleasant experiences better?" He concluded from his results that pleasant items were better recalled than unpleasant items. Although critics have pointed out that the questionnaire method used by Colgrave was not an adequate test of repression because of its lack of objectivity, it was,

nevertheless, the initial attack on the problem, and was used as late as 1935 as a technique, though unsuccessfully, for the study of repression.

Another contribution to the study of repression was the group of experiments concerned with the association of sensory stimuli with material to be learned and to be recalled later. Ratliff (9) combined numbers by the paired-associate method with pleasant and unpleasant sounds, colors, and odors with instructions to learn so that when the sensory cue alone was given the correct number would be recalled. The data was based upon immediate, 5, and 10-minute delayed recall, and analyzed in terms of amount and speed of recall as measured by the number of correct responses and reaction time. She found that recall was greater and reaction time was less for numbers combined with pleasant colors and sounds than with unpleasant colors and sounds, but that recall was greater and reaction times were less for numbers paired with unpleasant odors than with pleasant odors.

Further experiments in which events have been recalled and re-recalled included the study conducted by Kowalewski (5) in 1908, when, the day following a Christmas vacation, he instructed his students, "Write down whatever

pleased or displeased you yesterday." His results showed that more pleasant than unpleasant experiences were recorded. A recall ten days later yielded similar results. He interpreted his results to mean that the pleasant is better retained than the unpleasant, but he failed to recognize the fact that pleasant and unpleasant experiences are not necessarily equal in number. Other experiments which have used the recall of past experiences have been conducted by Gordon (3) and by Thompson (15), who used the recall of childhood experiences. Gordon found no evidence for a greater percentage of pleasant recall, but Thompson found evidence for a pleasant-unpleasant differential in favor of the pleasant. These experiments, on the whole, contributed little to the understanding of the mechanism of repression, and even less to the development of a technique for measuring repression, since they were concerned with differential forgetting of pleasant versus unpleasant associations, rather than of an active, removable repression.

A further development in the understanding of repression was contained in the studies which recognized the importance of learning set. A number of studies were conducted in which controversial material about which the subjects were known to have specific opinions was presented

and then recalled later. For example, Zillig (20) gave both men and women a number of selections to read, the content of some being favorable and others being unfavorable to women. He found that the women recalled a much greater percentage of favorable items about women than did the men. All that this and similar studies indicated was that attitudes and preconceptions influence memory, but, as will be seen, they cannot be considered as positive contributions to the understanding of repression or to the development of a suitable technique for the measurement of repression. Again, as Zeller noted, the analysis is of differential forgetting, not of an active, removable repression.

Some of the more recent experiments have come closer to presenting adequate techniques for the analysis of repression. For the first time, they have recognized the mechanism as an unconscious process produced by anxiety or unpleasantness, rather than a matter of an undefinable process centering around differential forgetting or preference for pleasant experiences or associations. These have included work by Sears (12) who presented a review of functional abnormalities of memory. He pointed out that none of the previous experiments had fulfilled the conditions of a true test of repression, since the fundamental assumption of these experiments had been that pleasantness

and unpleasantness of an intellectual or sensory nature is equivalent to unpleasantness in terms of ego threat. In line with his criticism, Sears (13) presented a study in which subjects were given two tasks, learning nonsense syllables and sorting cards. A list of nonsense syllables was learned, followed by a task which involved the sorting of a single deck of playing cards into the four suits. The score for the task was the number of seconds required to sort the deck of 52 cards. Subjects were told their scores after each trial and were asked to set a level of aspiration for the succeeding trial. The session ended with the learning of another list of nonsense syllables. In order to produce feelings of failure at the card-sorting with one group and feelings of success with the other, the experimenter reported scores falsely, in one case keeping the reported scores well below and in the other well above the level of aspiration as set for each trial by the subject. Subjects were told false averages for the rest of the group and an attempt was made, so far as was practicable without arousing suspicion, to report each succeeding trial as slower with the members of the Failure group and faster with the Success group. His data showed that failure at a semi-competitive task produced a progressive impairment of the efficiency with which that task was performed, and that failure on the one task impaired the performance of another

task temporally contiguous to the first and carried out in the same external stimulational setting as the first. In other words, he found that the second list learned by the successful card sorters was significantly better than the learning of the same list by those who failed at card sorting. As Zeller points out, that although Sears interpreted his findings as evidence of repression, the difference could well have been attributed to lesser motivation. Sears' study may not have been an actual demonstration of an active, removable repression, but it did come close to developing a technique for analyzing the mechanism. As will be seen in this present study, a similar technique has been used which the author feels comes even closer to the problem of analyzing an active, removable repression. Sears made no attempt to remove the repression in his study, but the present study includes this necessary step.

An example of a more recent development in establishing a technique for the demonstration of repression, but one that is difficult to interpret in light of the very nature of its approach is the experiment done by Huston, Shakow, and Erickson (4). Their subjects were hypnotized and were told that they had participated in some event in a manner out of keeping with their normal standard of ethics. Stimulus words, some neutral and some related to

the suggested experiences, were read to the subjects who had a post-hypnotic amnesia for the suggestions. The authors found significant differences in reaction to the words associated with the hypnotic suggestions. The subjects were then rehypnotized and the suggestion removed. Retests indicated that the effects had disappeared. Although this study comes close to a demonstration of repression, the use of hypnosis as a repression medium makes it difficult to interpret. It is not a practical experimental method, and entails the inclusion of experimental conditions which cannot be controlled rigidly.

A review of the literature on the analysis of repression yields certain facts relevant to this present study. They may be summarized as follows:

1. Most of the studies have been concerned with the differential forgetting of pleasant versus unpleasant experiences or associations, rather than of an active, removable repression.

2. Most of them have assumed the equivalence of sensory unpleasantness with ego unpleasantness, or have assumed the numerical equivalence of pleasant and unpleasant experiences, both of which have been found to be erroneous.

3. Many writers attributed their findings to repression, whereas other uncontrolled factors, such as

motivation, or attitudes and preconceptions, could have influenced the subjects' responses.

4. Most of them have utilized techniques which were either impractical so far as objectiveness is concerned, such as the questionnaire method, or were impractical experimentally, such as the hypnosis approach.

As Zeller states, "The problem of affect and recall is not a simple one, but rather a very complex phenomenon depending on many factors, such as sex, age, social status, intelligence, etc." None of the previous studies give a conclusive answer to the problem. In his final criticism, Zeller states, "that no test of repression can be considered adequate until the removal of the repression factor has resulted in the restoration to consciousness of the repressed material...." He further implies that an adequate test of repression involves two preliminary steps. These are first, that the material must be learned by the individual; and second, that the introduction of the inhibiting factor causes inability to recall or a significant decrease in recall of the material. Zeller proposes an experimental design, based on these three steps, which is as follows:

Control Group	Experimental Group
1 Learning Retention Test	1. Learning Retention Test
Time Interval	
11 Retention Test Neutral Task Retention Test	11. Retention Test Repression Retention Test
Time Interval	
111. Retention Test Neutral Task Retention Test	111. Retention Test Removal of Repression Retention Test

In 1, Zeller's first requirement, that the material be learned, is satisfied. In 11, the procedure varies, so that the Control Group does not receive the repression factor, and the Experimental Group does receive it, and the second criterion is met. In 111, the repression factor is removed from the Experimental Group and the Control Group receives another neutral problem, thus constituting the third and crucial step in the experimental demonstration of repression.

The study to be presented here admittedly does not follow Zeller's theoretical design for the analysis of repression. It does attempt to approach the problem of developing a practical technique for analyzing repression, by introducing an experimental design of its own, concerned with an active, removable repression.

THE EXPERIMENTAL INVESTIGATION

1. The Problem

Recalling that past experimental studies were not adequate tests of an active, removable repression, it was suggested that pain or unpleasantness associated with a particular symbol might be used in a problem solving situation to test the mechanism of repression, and, if successful, to develop a technique for analyzing repression. Therefore, the experiment was designed to investigate the following hypotheses. First, if subjects who are shocked for a response to a particular symbol in an insoluble problem situation fail to use that symbol for the solution of a subsequent soluble problem involving that symbol, then it could be interpreted as indicating that repression has taken place. Similarly, this interpretation might apply if subjects who are shocked for a response to a particular symbol in an insoluble problem situation need a significantly greater number of trials for the solution of a subsequent soluble problem involving that symbol than would subjects in the Control Groups. Second, if the first hypothesis is verified, but if subjects who receive an explanation of the insolubility of the problem and of the specific symbol causing shock succeed in using that symbol for the solution of a subsequent soluble problem

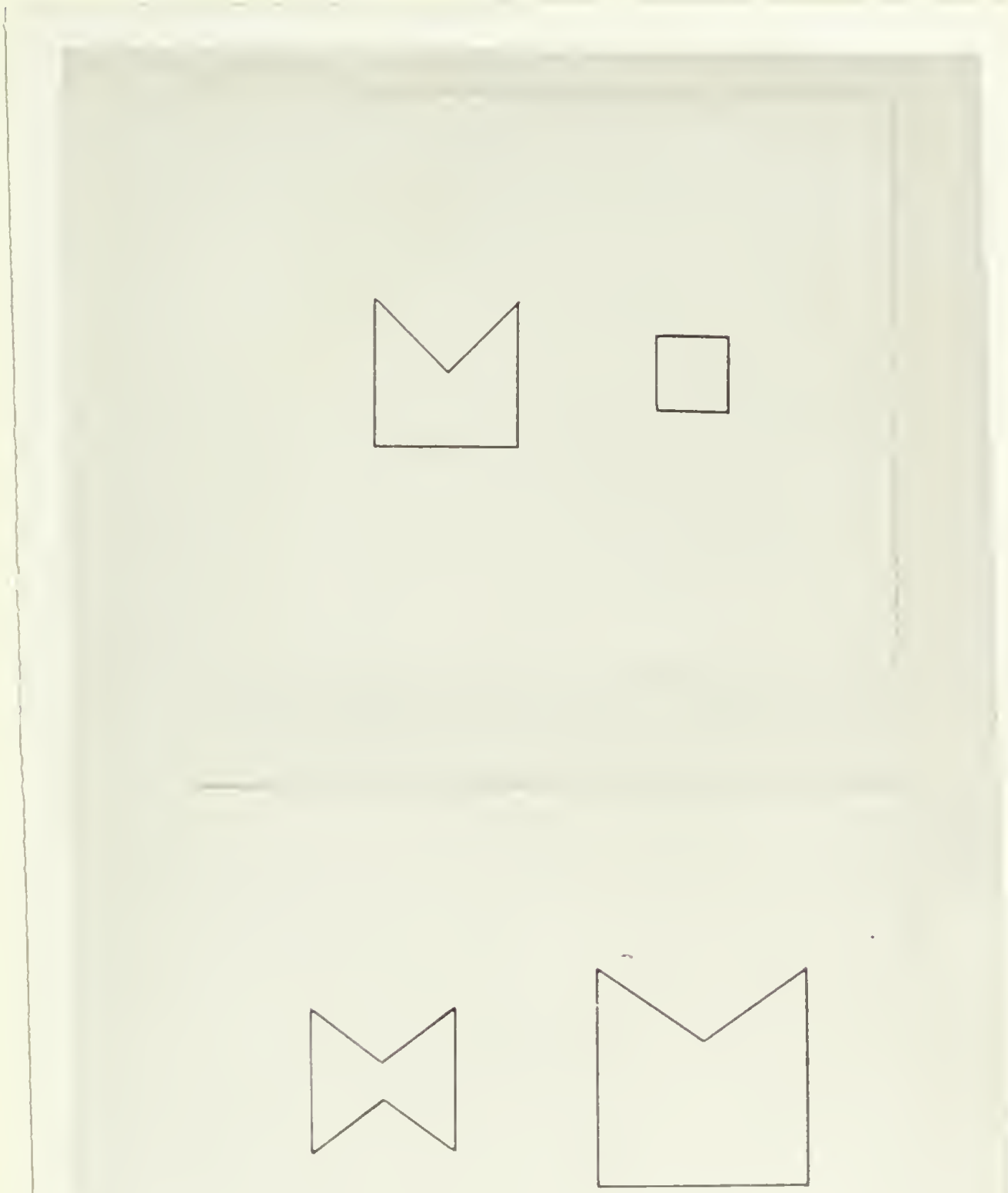
involving that symbol, then it could be interpreted as indicating that the repressed material has been restored to consciousness and is no longer influencing overt behavior. Similarly, this interpretation might apply if subjects who are shocked for a response to a particular symbol in an insoluble problem situation need a significantly smaller number of trials for the solution of a subsequent soluble problem involving that symbol than would subjects not receiving the explanation. Finally, if subjects who are shocked for response to a particular symbol in an insoluble problem situation succeed in using that symbol for the solution of a subsequent soluble problem not involving the use of that symbol, then it could be interpreted as indicating that the repressed material has not influenced subsequent neutral tasks. Similarly this interpretation might apply if subjects who are shocked for a response to a particular symbol in an insoluble problem situation need a significantly smaller number of trials for the solution of a subsequent neutral problem than would subjects in the groups receiving the related problem.

II. Apparatus and Procedures

A procedure and apparatus similar to that used by Marquart (8) was used. A series of stimulus cards (see plate 1, p. 13) were designed, using pairs of figures which are described as

Plate 1

Examples of Stimulus Cards

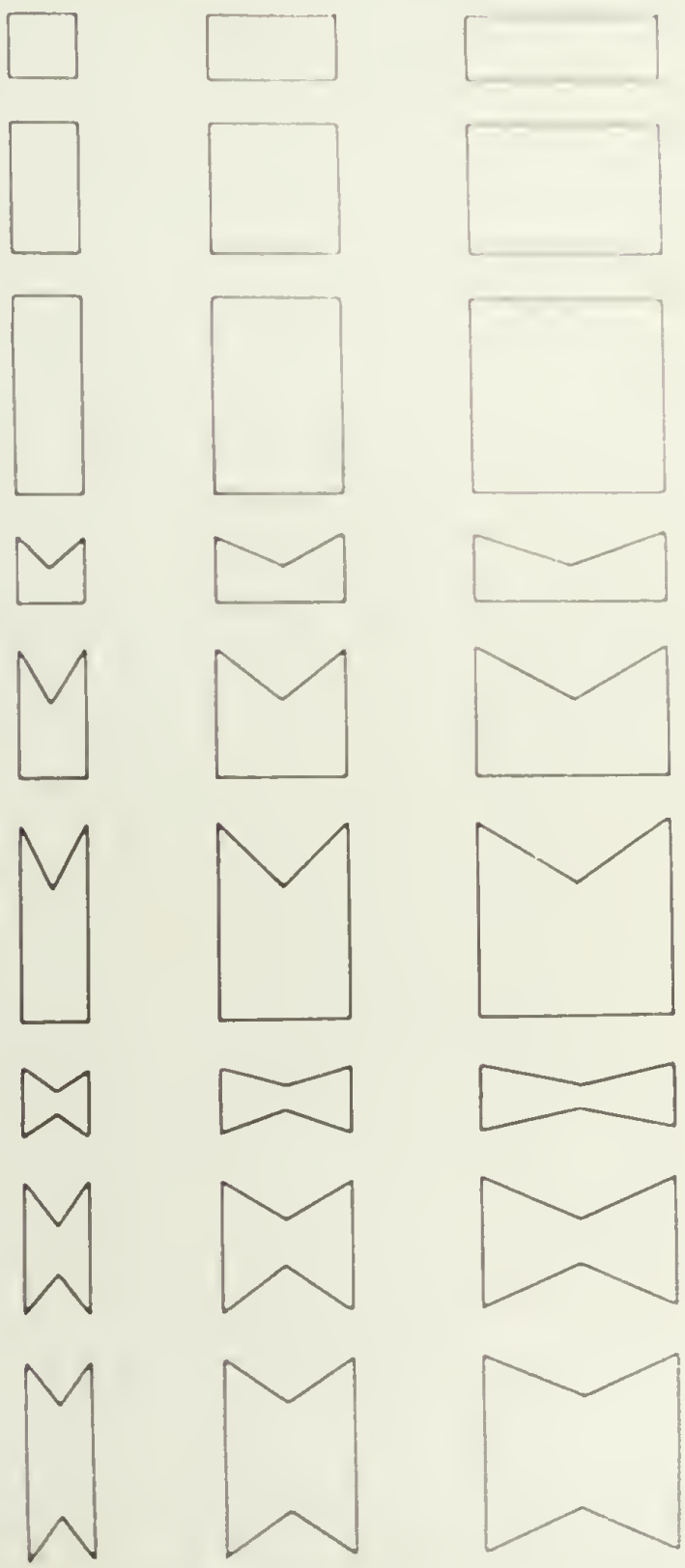


follows. The three main variables contained in the figures were height, width, and number of sides, each of which had three additional variables. There were short figures measuring one-half an inch in height, intermediate ones measuring one inch, and tall ones measuring one and one-half inches; there were narrow, medium, and wide figures of the same relative size; and there were four-sided, five-sided, and six-sided figures, as shown in Figure 1. The number of sides was determined by having the four-sided figure represented as either a square or a rectangle, the five-sided figure as having one indentation on the top, and the six-sided figure as having an indentation both at the top and at the bottom.

Three series of pairs of figures, consisting of 30 pairs each were selected from a total 702 possible combinations, and used in each of three series of the experiment. These series were rigidly controlled so that there was an equal number of each of the nine variables described above located on either side of the stimulus card. For example, in Session I the left-hand and right-hand sides of the cards each contained 10 short, 10 intermediate, and 10 tall figures; 10 narrow, 10 medium, and 10 wide figures; and 10 four-sided, 10 five-sided and 10 six-sided figures. In addition to this, there were

Figure 1

Drawings of Stimulus Figures



15 taller, 15 shorter, 15 narrower, and 15 wider figures on each side of the card. In Session II-A, which was an insoluble problem, the number of short figures appearing on either side of the card was altered as a part of the experimental design so that there would be 15 cards containing the short figure of which 3 cards contained two short figures. This changed the number of short figures appearing in each side of the card to 9, and the number of intermediate figures to 11. Aside from this exception, the variables were stringently controlled with respect to size, position, and frequency of appearance. The figures were outlined in India ink on white cards which measures 4" x 5".

The apparatus observable to the subject, which is shown in Figure 2, consisted of the following parts. A manually operated card exposure apparatus was placed on a table so that the simulus cards could be presented to the subject one at a time. Two triple-pole single-throw knife switches were placed on the table in front of the card exposure apparatus, by means of which the subject indicated his selection from the pairs of figures on each card, i. e., the subject closed the right-hand switch if he selected the right member of the pair, and the left-hand switch if he selected the left member of the pair. A leather wrist

Figure 2

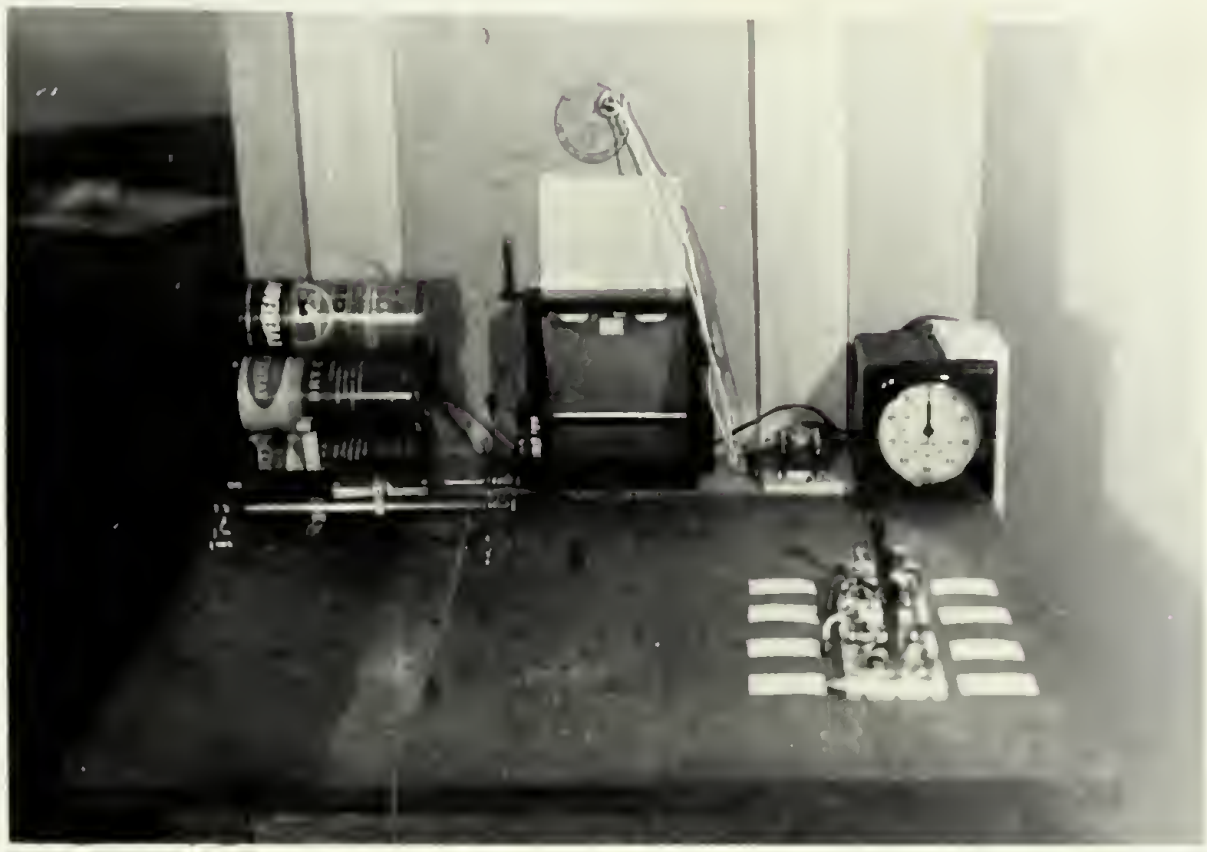
Apparatus Observable to Subject

band fitted with a copper electrode was fastened on each wrist of the subject, and a cotton pad dipped in a concentrated saline solution was placed between the copper plate and the skin to insure good contact. A wire was led from an inductorium to the handle of the knife switch, and the handle was wound with string and saturated with the saline solution so that if the subject made an incorrect response, a shock from the inductorium was felt at the fingertips. A small light bulb was placed above the card exposure apparatus which was illuminated when the subject made a correct response. A screen in the center of the table, separating the subject from the experimenter, had three apertures - one into which the card exposure apparatus was placed so that only the door or the card was exposed to the subject, another into which the light bulb was placed, and the third through which a piece of cord was drawn so that the experimenter could close the door of the card exposure apparatus as soon as the subject made a selection.

On the experimenter's side of the separating screen, the apparatus (see Figure 3) included an electric time clock which was automatically turned on as soon as each card was exposed to the subject and automatically shut off when either of the switches was closed, the

Figure 3

Apparatus Observable to Experimenter



inductorium to regulate the amount of shock, a relay to break the clock circuit, five 1.5 volt dry cells, one single-pole single-throw knife switch and three double-pole double-pole double-throw knife switches which controlled the presentation of the light and shock to the subject's responses. By manipulating these switches the experimenter could cause the subject to receive a shock when the left-hand switch was closed or a light signal if the right-hand switch was closed, and vice versa. Also, the experimenter could connect both of the subject's switches with shock, and finally, the experimenter could connect both of the subject's switches with the light signal.

When the door of the card exposure apparatus opened to reveal the stimulus card to the subject, a contact was made starting the time clock, and when the subject made a response by closing a switch, a relay was set into operation breaking the time clock circuit and stopping the clock.

III. Subjects

One hundred and one subjects were selected from the undergraduate classes at the University of Massachusetts. The group consisted of seventy males and thirty-one females.

IV The Experimental Procedures

Session I. The subject was brought into the experimental room, and was seated at the apparatus. (See Figure 4) The wrist bands were attached, and the following instructions were given:

> "This is a learning situation. I will present a series of cards, one at a time. When I say, 'ready', this door (indicate) will open and a card will appear before you. On each card there are a pair of figures, one on the left and one on the right. You are to select one of the figures for each card, and indicate your selection by closing the appropriate switch. For example, if you select the left-hand figure, close the left-hand switch (indicate); if you select the right-hand figure, close the right-hand switch (indicate). Please be sure to make a good contact so that it will record for me. You may remove your hand from the switch immediately after closing it. I will say, 'release it', when I want you to re-open the switch. Are there any questions? If your selection is correct, you will be signaled with a light (indicate light bulb). If your selection is incorrect, you will receive a slight shock on your fingertips. You will adjust the amount of shock to be received before the experiment begins.
> "This is the basis upon which you are to make your selections. There is a common factor running through the series of cards. In other words, there is one factor which will prove correct, and thus avoid shock for every single card. You are to find this by trial-and-error. For example, it may be the larger figure that is correct for the series. If you test this factor out, and receive a shock, eliminate it as the common factor. Pick a new one and test it out. If you repeatedly get the light signal for your selections, continue to use the same basis for your selection. Please feel free to verbalize during the experiment, as this may help you to solve the problem. One final

Figure 4

Apparatus During Experimentation

word of caution, remember that the solution must hold true for every card of the series. If your principle does not hold true for any one card, it is not the solution to the problem. There is no time limit for the exposure of the cards, but you are urged to make your selections as quickly as possible. Are there any questions?"

Each subject was then exposed to varying intensities of shock to determine the level at which the subject found the shock unpleasant enough to avoid, but not so strong as to cause any severe pain.

Each subject was then presented with a soluble discrimination problem, the solution of which was the wider of the two figures on each card. Shock was administered for incorrect responses, and the light was turned on for correct responses. The experimenter recorded the response latencies for each response, the number of trials required to solve the problem, and all comments made by the subject during this session. The criterion for the solution was set at five successive correct responses. In addition, when five correct responses were made, the subject was asked for the basis for his responses and if his success was due to chance, he was asked to continue. Any subject who failed to solve the problem after three successive presentations of the series

(90 card presentations) was eliminated from further experimentation.

At the close of the session, the following was said to the subjects:

> "Thank you for your cooperation. Please do not discuss this experiment with anyone. To do so would invalidate the whole study that I am conducting. At the conclusion of the study I will tell you the purpose of the experiment and I will answer any questions you may raise concerning it. Please tell me whether you had any previous knowledge of this experiment. I must have this information so that I may equate you into the proper group for the next session." *

The experimenter also informed the subject that he would have to return for a second session, and that he would be notified in advance concerning the time of his appointment.

The subjects who qualified for the second session, i. e., those who had satisfied the learning criterion of Session I were then equated on the basis of the number of trials required for the solution of the problem. That is, the scores were arranged in a rank order, from lowest to highest, with alphabetical preference given to those

---

* This last statement in the final instructions was used to discover any persons who had previous knowledge, so that they could be eliminated from the experiment.

subjects who had the same scores. These scores were counted off into groups of five. Then the order of the alternated groups of five scores was reversed so that a group of scores going from the lowest to highest was followed by a group of scores going from highest to lowest, e. g., the orders of scores were rearranged from 1 2 3 4 5, 1 2 3 4 5, 1 2 3 4 5, etc., to 1 2 3 4 5, 5 4 3 2 1, 1 2 3 4 5, etc. This resulted in arranging the five groups necessary for Session II with means and standard deviations that were as equal as possible.

The five groups, whose roles are described below consist of the following divisions, and are designated by the bracketed symbol on the right.

Control Group I ..... (C_t)

Control Group II ..... (C_s)

Experimental Group I ..... (E_t)

Experimental Group II ..... (E_s)

Experimental Group III ..... (E_{ts})

Session II. After a two week interval, the subject was again brought into the experimental room, and was seated at the apparatus. The wrist bands were attached, and the following instructions were given.

"This is another learning situation of the same type used in the first session. Here again you are to make your selections by trial-and-error, until you find a factor which will hold true for every card. You will receive a light for correct responses, and a shock for incorrect responses. Please give the reason for your selection for each card after you have closed one of the switches. By doing so you will remember more clearly the factors which you have tested out. If a selection happens to be a guess, please indicate whether you chose a left-hand or a right-hand figure. Are there any questions?"

Each subject was then again exposed to varying amounts of shock to determine the level at which the subject found the shock unpleasant enough to avoid, but not so strong as to cause any severe pain.

Control Group I. The C_t subjects were presented with a soluble discrimination problem, the solution of which was the taller of the two figures on every card. Shock was administered for all incorrect responses, and light was turned on for correct responses. All other conditions in respect to recording, criterion number of trials, etc., were the same as in Session I.

Control Group II. The C_s subjects were presented with a soluble discrimination problem the solution of which was the shorter of the two figures on every card. Conditions were the same as for the C_t subjects.

Experimental Group I. The E_t subjects were presented with an insoluble discrimination problem in which the appearance of a short figure on any card resulted in shock for the subject regardless of which switch he closed. Each subject was given three successive presentations of this series (90 card presentations). Therefore, each subject received 45 punishment trials and 45 reward trials. Conditions with respect to the recording of the data were the same as in the other groups. At the end of this insoluble series, the experimenter said,

> "That is all for that problem. Here is another one. See how well you can do on this one."

After a time interval of approximately two minutes, the E_t subjects were presented with a new soluble problem in which the solution was the taller of the two figures on each card. The criterion number of trials for the solution of the problem was set at five successive correct responses. All other conditions were the same as for the C_t and C_s subjects.

At the close of the session, the following was said to the subject.

"Thank you for your cooperation. I must again ask you not to discuss this experiment with anyone. As soon as I collect all the data, I will give you a report on the study that I am conducting. If you had any previous knowledge of this experiment, please tell me so that I can enter your results into the appropriate group." *

Experimental Group II. The E_s subjects received the same insoluble discrimination problem as did the E_t subjects. After the two minute time interval following the first part of Session II, the E_s subjects were presented with a new soluble problem in which the solution was the shorter of the two figures on each card. All conditions and explanations were the same as those in the second problem for E_t.

Experimental Group III. The E_{ts} subjects were presented with the same insoluble discrimination problem as were the E_s subjects. The same conditions and procedures were used, except that, following the conclusion of the three successive presentation of this series (90 trials), the subject was instructed as follows:

"That is all for that problem. Perhaps you realize that you could not solve it as you did in the first session. That was because this was an insoluble problem. Every time a short figure appeared on a

---

* This last statement was again used to discover any persons who had previous knowledge of the experiment, so that their data could be eliminated.

> card, you were shocked, regardless of which switch you closed. It was the short figure, then, that was causing you to receive shock. Do you understand? Now I want you to try a new problem. See how well you can do on this one."

Following this explanation, the E_{ts} subjects were presented with the same soluble problem, with the same conditions present, as were the E_s subjects.

The procedures for each group are summarized in Table I.

Table I

Summary of Experimental Procedures

Group	Session I	Session II	
		Part A	Part B
Control I (C_t)	Learn Soluble Problem (1)		Learn Soluble Problem (3)
Control II (C_s)	Learn Soluble Problem (1)		Learn Soluble Problem (4)
Experimental I (E_t)	Learn Soluble Problem (1)	Insoluble Problem (2)	Learn Soluble Problem (3)
Experimental II (E_s)	Learn Soluble Problem (1)	Insoluble Problem (2)	Learn Soluble Problem (4)
Experimental III (E_{ts})	Learn Soluble (Problem (1)	Insoluble Problem (2) (Subjects told) *	Learn Soluble Problem (4)

(1) Solution was selecting the wider of the two figures on each card.

(2) The problem was insoluble in that every time a short figure appears on a card, the subject is shocked regardless of his selection.

(3) Solution was selecting the taller of the two figures on each card.

(4) Solution was selecting the shorter of the two figures on each card.

* The subjects were instructed as to the insolubility of the problem, pointing out that every time a short figure appeared on a card they were shocked, regardless of their selections. This was the only group that received this explanation.

RESULTS

Session I. Of the 101 subjects who participated in the first soluble problem, 16 failed to solve the problem after having received three successive presentations of the series, or 90 card presentations. This included 10 males and 6 females. The remaining 85 subjects then consisted of 60 males and 25 females. The range of trials including criterion trials needed to solve this problem was between 6 and 90 trials.

According to the procedure described on page 25, these subjects were placed into the five groups for the next stage of the experiment. Table 2 shows how the subjects were distributed. The mean scores for the solution of the Session I problem were 28.73, 28.80, 28.73, 29.20, and 29.60 for the five groups. It is rapidly seen from an inspection of the table and the means of the groups that adequate matching was effected.

Session II. Of the 85 subjects who had qualified for Session II, 75 of them, 54 males and 21 females, completed the procedures of Session II. The distribution of these scores are represented in Table 3. Two subjects left school before this session was completed, and their data had to be eliminated from the experiment; and, in order to keep the populations equated, the other 8 subjects

Table 2

Number of Trials Required for the Solution

of the Session I Problem and

The Distribution of Subjects for Session II *

Sub. No.	Control I C_t	Sub. No.	Control II C_s	Sub. No.	Exptl.I E_t	Sub. No.	Exptl.II E_s	Sub. No.	Exptl.III E_{ts}
1	6	2	6	3	7	4	8	5	8
10	13	9	13	8	11	7	10	6	9
11	13	12	14	13	15	14	15	15	15
20	16	19	16	18	16	17	15	16	15
21	17	22	17	23	17	24	17	25	18
26	21	27	21	28	21	29	21	30	22
35	25	34	24	33	24	32	24	31	22
36	26	37	26	38	26	39	26	40	26
45	28	44	27	43	27	42	27	41	27
46	29	47	29	48	29	49	30	50	30
55	35	54	35	53	34	52	34	51	31
56	36	57	36	58	37	59	39	60	40
65	41	64	41	63	41	62	40	61	40
70	60	69	58	68	53	67	52	66	51
71	65	72	69	73	73	74	80	75	90
Mean	28.73		28.80		28.73		29.20		29.60

* Two subjects did not complete the subsequent procedures, and in order to keep the groups equated, the subjects matched to them were likewise eliminated, thus leaving only 75 subjects.

Table 3

Number of Trials Required for the

Solution of the Session II Problem

Sub. No.	Control I C_t Learn Taller	Sub. No.	Control II C_s Learn Shorter	Sub. No.	Exptl.I E_t Learn Taller	Sub. No.	Exptl.II E_s Learn Shorter	Sub. No.	Exptl.III E_{ts} Learn Shorter Told
1	7	2	9	3	14	4	18	5	7
10	8	9	6	8	23	7	7	6	5
11	22	12	6	13	22	14	16	15	6
20	9	19	20	18	21	17	17	16	7
21	8	22	6	23	49	24	8	25	27
26	14	27	7	28	9	29	8	30	8
35	8	34	18	33	8	32	11	31	8
36	13	37	26	38	10	39	18	40	18
45	13	44	15	43	9	42	9	41	9
46	11	47	7	48	6	49	22	50	19
55	6	54	9	53	20	52	8	51	21
56	12	57	6	58	21	59	18	60	14
65	8	64	6	63	9	62	9	61	18
70	5	69	6	68	19	67	32	66	6
71	8	72	12	73	13	74	21	75	9
Mean	10.13	Mean	10.60	Mean	16.87	Mean	14.80	Mean	12.13
S.D.	4.121	S.D.	6.107	S.D.	9.296	S.D.	6.852	S.D.	7.316

who were equated with these two had to be eliminated from these procedures.

The results of the Session II problems are represented in Figure 5 (histogram). It can be seen that the distribution of scores made by the two Control Groups, C_t and C_s, appear to be very similar. The distribution of scores of the three Experimental Groups, E_t E_s and E_{ts}, show greater variability. Of the three Experimental Groups, the histogram of the E_{ts} group most nearly resembles the histograms of the two Control Groups. This similarity will be described and explained in greater detail below.

In analyzing the differences between the five groups of subjects, Student's *t* test, which was designed specifically for determining the differences between the means of small samples, was used. Comparisons of the mean number of trials for the solution of the soluble problems in Session II may be seen in Table 4.

To begin with, the C_t and C_s groups were compared to determine whether there was an equal amount of difficulty involved in the two soluble problems used in Session II. The mean for the C_t (learn taller) group and the mean for the C_s (learn shorter) group were 10.13 and 10.60

respectively, with a mean difference of .47. Student's t test for the significance between means of related samples, with 14 degrees of freedom, yielded a t value of .242. Since this t value was found to lie between the 90% and 80% levels of confidence, it may be assumed that there was no significant difference between the learning scores of these groups. In other words, both of the soluble problems used in Session II were of equal difficulty since both control groups required approximately the same number of trials to solve them. Therefore, any differences between groups which are found to support the hypotheses must be attributed to factors other than that the two soluble problems differed in degree of difficulty.

The C_s and E_s groups may now be compared to determine whether the solution of the problem which required the selection of the shorter figure was negatively affected by the preceding insoluble problem in which the subject was punished at the appearance of the short figure on the card. In connection with the hypothesis that the unconscious association of unpleasantness with a particular symbol would result in failure or a hesitance to use that symbol in the solution of a subsequent soluble problem involving the use of that symbol, it was expected that the mean difference between the C_s and E_s groups would be significantly different.

Figure 5

Histograms of Number of Trials

Required for Soluble Problems in Session II

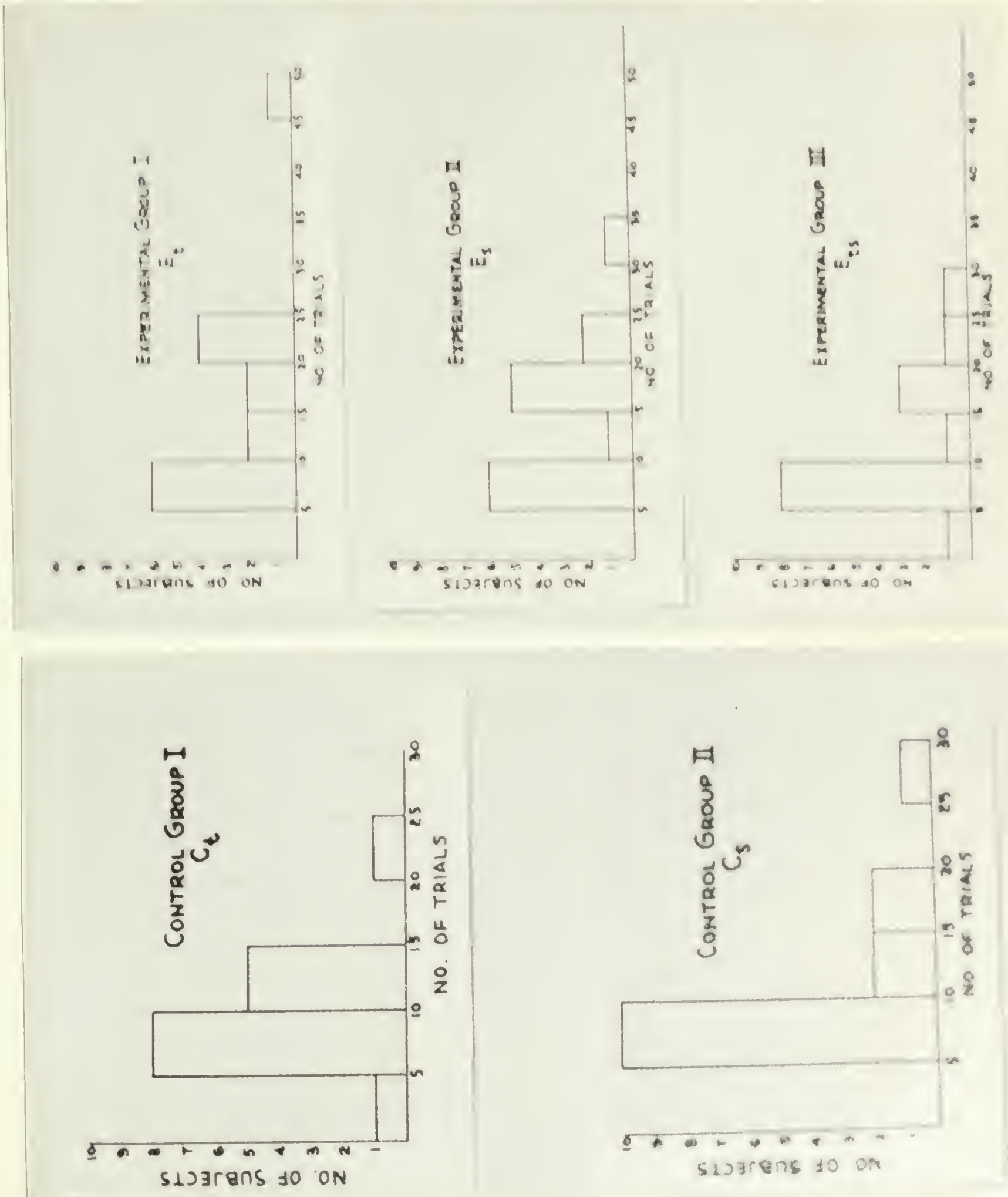


Table 4

The Comparative Significance of the Mean Differences Between the Groups Solving the Session II Soluble Problems

Group	Mean Difference	t	P	Degrees of Freedom
C_t and C_s	.47	.242	Btw. 90% & 80%	14
C_s and E_s	4.20	1.74	Btw. 20% & 10%	14
C_s and E_{ts}	1.53	.618	Btw. 60% & 50%	14
E_t and E_s	2.07	.582	Btw. 60% & 50%	14
E_s and E_{ts}	2.67	.943	Btw. 40% & 30%	14
C_t and E_t	6.74	2.19	Btw. 5% & 2%	14

The mean for the C_s (learn shorter) group and the mean for the E_s (insoluble problem - learn shorter) group were 10.60 and 14.80 respectively, with a mean difference of 4.20 The t test, with the appropriate degrees of freedom, yielded a t value of 1.74. This t value indicates that the obtained difference between means lies between the 20% and 10% levels of confidence. It is apparent, then, that chance factors could reasonably explain these findings, but, as will be seen later, the trend of the data is in the expected direction when considered in light of other findings.

In line with the hypothesis which stated that explaining the insolubility of the problem would aid the subject in solving a subsequent and related soluble problem by removing repressive influences, a comparison was made of the C_s and E_{ts} groups. Since the E_{ts} group received the shock with the short figure during the insoluble problem, then had the insolubility explained, the group, according to the hypothesis, should have learned the soluble problem as readily as the C_s group which did not take part in the insoluble problem. The mean for the C_s (learn shorter) group and the mean for the E_{ts} (insoluble problem - told - learn shorter) group were 10.60 and 12.13 respectively, with a mean difference of 1.53. Student's t test, with the

appropriate degrees of freedom, yielded a t value of .618. Since this t value was found to lie between the 60% and 50% levels of confidence, it may be assumed that there was no significant difference between the means of those groups. This would indicate that the explanation given to the E_{ts} group aided them in solving the subsequent soluble problem involving the use of the symbol formerly associated with shock. It will be seen however, that other requirements for the substantiation of the hypothesis were not met, consequently other hypotheses will have to be offered to explain this finding.

To further support the repression hypothesis, a comparison was made between the means of the E_s and E_{ts} groups. Finding a significant difference between these groups would strengthen the hypothesis because it would show that the explanation was successful in counteracting the effect of the association of unpleasantness with the short figure. The mean for the E_s (insoluble problem - learn shorter) group and the mean for the E_{ts} (insoluble problem - told - learn shorter) were 14.80 and 12.13 respectively, with a mean difference of 2.67. The t value for this difference was .943, which indicates that the difference is significant between the 40% and 50% levels of confidence. Although this would indicate that there was not

a reliable difference between the two groups, one should note, however, that while this finding is, in itself, unreliable, the data and its direction, in light of other findings, lends some support to the major hypotheses.

Having already established that there was an equal amount of difficulty involved in the soluble problems in Session II, the E_t and E_s groups were then compared to determine whether the subjects who were presented with an insoluble problem in which the appearance of the short figure resulted in shock required fewer trials to solve the neutral problem than did the subjects to solve the related subsequent soluble problem. In line with the hypothesis, that the unconscious association of unpleasantness with a particular symbol would result in failure or a hesitance to use that symbol in the solution of a subsequent related soluble problem, it was expected that the mean difference between the E_t and E_s groups would be significantly different. The mean for the E_t (insoluble problem - learn taller) group and the mean for the E_s (insoluble problem - learn shorter) group were 14.80 and 16.87 respectively, with a mean difference of 2.07. The t test yielded a t value of .582. This t value was found to lie between the 60% and 50% levels of confidence. This indicated that there was not a reliable difference between the number of trials required by the E_t and E_s groups to solve the two problems. It is true that the difference is greater than those found, for example

between the two Control Groups who learned the same two problems, and between the E_s and E_{ts} groups; however, as can be seen on Table 4, the mean learning score for the E_t group is greater than that for the E_s group. In other words, we have here a slight trend in the opposite direction which fails to support a major aspect of the original hypothesis. That is, the data does not inform us whether there was an unconscious association between the short figure and unpleasantness.

The E_t and E_{ts} groups were then compared to determine whether any further support could be given to that part of the hypotheses which stated that explaining the insolubility of the problem would aid the subject in the solution of a subsequent and related soluble problem by removing repressive influences. Since it has already been found that the comparison between the E_{ts} and E_s groups, both of which received the related problem did not strongly support the hypotheses, it was then necessary to determine whether there was any difference in the number of trials needed to solve the soluble problem in Session II between the E_t group which received the neutral problem following the explanation of the insoluble problem. The mean for the E_t (insoluble problem - learn taller) group and the mean for the E_{ts} (insoluble problem - told - learn shorter) group were 16.87 and 12.13 respectively, with a mean

difference of 4.74. The t test for significance yielded a t value of 1.761. This t value was at the 10% level of confidence. This indicated that there was not a significant difference between the number of trials required by the E_t and the E_{ts} groups to solve the two subsequent soluble problems. It is true that the difference is more reliable than those found, for example, between the E_t and the E_s groups which learned the same two problems. As can be seen in Table 3, the mean learning score for the E_t group is greater than that for the E_{ts} group. This would indicate that the E_t group may have generalized their responses to one of height, thus needing a larger number of trials than the E_{ts} group to solve the final soluble problem. If it may be assumed that the E_{ts} group solved the soluble problem in fewer trials than the E_t group as a result of the fact that the E_{ts} group was relieved of the repressed material before undertaking the related soluble problem, then it could be said that the E_t group was negatively influenced in the solution of the neutral soluble problem by the generalization which occurred in the insoluble series. So far as the hypotheses are concerned, this finding supports that portion which stated that the explanation of the insolubility of the problem would aid the subject in the solution of a subsequent and related soluble problem.

The C_t and E_t groups may be compared to determine whether there was a significant difference between the

learning scores of the C_t group which received only the neutral problem and the E_t group which received the neutral problem after the insoluble problem. Theoretically, no difference should have been found between these two groups, providing that the unpleasantness was associated only with the short figure without the subject's awareness. The mean for the C_t (learn taller) group and the mean for the E_t (insoluble problem - learn taller) group were 10.13 and 16.87 respectively, with a mean difference of 6.74. The t test for the significance between means yielded a t value of 2.19, which was found to be significant between the 5% and 2% levels of confidence. This indicated that it took the C_t group fewer trials to solve the neutral problem than it took for the E_t group. This difference may be attributed to the fact that the E_t group may have generalized the unpleasantness to avoidance of height. At any rate, this finding was contrary to hypothetical expectations.

An analysis of the latencies of responses was made between Session I and both parts of Session II, which can be seen in Table 5. This data was collected to see whether there was any change in average reaction time between the solution of the soluble problem in Session I and the insoluble problem in Session II, and also between the insoluble problem and the soluble problem in Session II. It was found that the response latencies were greater for

Table 5

Comparison of Average Reaction Times in Seconds of the Control and Experimental Groups

Group	Session I	Session II Part A	Session II Part B	Group Mean
C_t	3.50		2.33	2.91
C_s	2.24		2.25	2.24
E_t	2.75	3.60	1.98	2.78
E_s	2.04	3.49	2.50	2.68
E_{ts}	2.70	4.85	2.16	3.24
Session Mean	2.64	3.98	2.24	

the insoluble problem in Session II than those during the soluble problems in Session I and II. An analysis was also made of the response latencies to the cards in the insoluble problem which contained two short figures to determine whether the subjects would make a differential response to thosecards. It was found that, for the three cards in the series which had two short figures, the mean reaction time was 3.12. This, when compared to the mean reaction time of 3.98 to all of the cards in the insoluble problem, indicated that the subjects responded a little more quickly to the cards with the two short figures than they did to all of the cards in the insoluble series. However, the difference is slight, and it can therefore be assumed that these cards were not especially unique in the subjects' experiences.

An analysis was made to determine whether there were any particular behavior patterns observed during the insoluble series which might be used in interpreting the results. It was found, as can be seen in Table 6, that a large percentage of the subjects expressed feelings of hopelessness, and a large percentage repeatedly selected figures which they realized were incorrect. A relatively small percentage of the subjects displayed anger or aggression. It is interesting to note that in the E_S group, 33% of the subjects expressed suspicions of the

Table 6

Behavior Patterns for Experimental Groups

in Insoluble Problem in Session II

Group	Feelings of Hopelessness	Anger	Aggression	Repeated Wrong Choices	Stereotypy of Response	Negative Self Feeling	Suspected Insolubility
E_t	10 (66%)	5 (33%)	1 (6%)	12 (80%)	8(53%)	3 (20%)	0 (0%)
E_s	11 (73%)	6 (40%)	1 (6%)	12 (80%)	6 (40%)	4 (26%)	5 (33%)
E_{ts}	13 (87%)	3 (20%)	2 (13%)	13 (87%)	12 (80%)	4 (26%)	1 (6%)

insolubility of the problem, whereas none did in the E_t group, and only 6% did in the E_{ts} group. The significance of this finding will be discussed and explained in the following section of the study.

DISCUSSION AND CONCLUSIONS

This experimental study was undertaken in an attempt to devise a method for analyzing repression. The validity of the foregoing technique depended upon the verification of the following hypothetical relationships.

First, there should have been no significant difference between the C_s and C_t groups, since the experimenter needed to be assured that the soluble problems used in Session II were of equal difficulty. Any difference found between groups could then be attributed to variations of the procedures. Since no significant difference was found between these groups, this part of the technique was validated.

Secondly, there should have been a significant difference between the C_s group which received no insoluble problem, and the E_s group which received both the insoluble problem and the related soluble problem, since this would have verified the hypothesis that if subjects who are shocked for a response to a particular symbol in an insoluble problem situation fail to use that symbol for the solution of a subsequent soluble problem involving the use of that symbol, then it could be interpreted as indicating that repression has taken place. Since the obtained

difference between the means of these two groups was found to be between the 20% and 10% levels of confidence, it can be concluded that, although the difference is not very reliable, the trend of the data is in the expected direction.

Next, there should have been no significant difference between the C_s group and the E_{ts} group, since it was stated in the hypotheses that if the subjects who receive an explanation of the insolubility of the problem in Session II and of the specific symbol causing shock, succeed in using that symbol for the solution of a subsequent soluble problem involving that symbol, then it could be interpreted as indicating that the repressed material has been restored to consciousness and is no longer influencing overt behavior. Since it was found that there was no reliable difference between these groups, it was suggested that this portion of the hypotheses was supported, but there was no evidence that repression occurred since no significant differences were found between E_t and E_s and between C_s and E_s.

As a further support to the above-mentioned finding, it was expected that there would be a significant difference between the E_s group which received no explanation of the

insoluble problem and the E_{ts} group which did receive the explanation. It was found that the t value lay between the 40% and 50% levels of confidence, which indicates an unreliable difference between the two groups. However, the trend of the data is in the expected direction, i. e., the mean number of learning trials for the E_{ts} group is less than that of the E_s group.

According to the hypothesis concerned with the effect of the introduction of unpleasantness associated with the short figure, there should have been a significant difference between the E_t and E_s groups, since the former had to solve the neutral problem and the latter had to solve the related problem. As was said above, there was not a significant difference between the groups, and that the trend of the data was in the opposite direction. In other words, the group which received the neutral problem required more trials than did the group which received the related problem. It can be concluded that this finding did not support the original hypothesis. However, as was seen in Table 6, it was evident that five out of 15 (33%) subjects in the E_s group expressed suspicions that the problem was insoluble, whereas none did in the E_t group and only one out of 15 (6%) did in the E_{ts} group. Exactly

why this occurred cannot be fully explained. Extreme caution was taken to avoid giving cues to any of the groups, and so far as is known, the experiment was kept confidential by all of the subjects. It remains, however, that there were enough individuals in the E_s group who suspected the insolubility of the problem to affect the mean learning scores on the subsequent soluble problem. In other words, since the E_s group suspected that the problem was insoluble, it is possible that they resigned themselves to the situation. This reduced the subject's feeling of embarrassment as a result of failure and precluded repression from taking place. Furthermore, if repression did not take place, then the subsequent learning scores of these individuals would be reduced enough to account for the fact that the E_s group did not differ significantly from the E_{ts} group.

Theoretically, there should have been no significant difference between the C_t and the E_t groups, since both groups received the neutral problem, in spite of the fact that the E_t group received the insoluble problem before the neutral problem. A possible explanation that was given for the significant difference that was found between these two groups was that the E_t group may have generalized the unpleasantness associated with the short figure to the principle of height. It is to be emphasized that this

finding also does not enable us to say that the unpleasantness was restricted in its association to the short figure or to the principle of shorter.

As can be seen by the findings presented above, the hypotheses of this study were not conclusively verified. In some of the analyses, the obtained results supported the hypothetical expectations or were found to at least be in the expected direction, but in others, the obtained results failed to verify the hypotheses. Table 7 graphically represents the relationships between the obtained differences as compared to the hypothetical expectations.

In order to have supported the first hypothesis which was concerned with the effect of the introduction of unpleasantness associated with a particular symbol which was to be used in the solution of a subsequent soluble problem, the results should have indicated a significantly greater number of trials needed by the E_s group as compared to the C_s group to solve the soluble problem in Session II. This was verified by the findings of the study. However, in order to satisfy completely the first hypothesis, the E_s group should have required a significantly greater number of trials to solve the soluble problem in Session II than needed by the E_t group or by the E_{ts} group. The

Table 7

Trend of Obtained Differences Between the Groups as Compared to Hypothetical Expectations

No Difference Between Groups	Expected Order		Obtained Order
1	C_t and C_s	1	C_t and C_s
2	C_t and E_t	2	E_t and E_s
3	C_s and E_{ts}	3	C_s and E_{ts}
4	E_t and E_s	4	E_s and E_{ts}
5	C_s and E_s	5	C_s and E_s
6	E_s and E_{ts}	6	C_t and E_t

Significant Difference Between Groups

The arrows connect the expected and the obtained orders for each group.

results indicated, however, that there was no significant difference between the E_s and the E_t group, and also that the E_s group required fewer trials than the E_t group to solve the soluble problem in Session II. The results also indicated that the difference between the E_s and the E_{ts} groups was not very reliable, even though the trend was in the expected direction. Once again, this failure to support the hypothesis could be attributed to the fact that the E_s group was suspicious of the insolubility of the problem in Session II.

In order to have supported the second hypothesis which was concerned with the effect of the relief of repression on subsequent and related problem solving, the results should have indicated a significantly fewer number of trials needed by the E_{ts} group as compared to the E_s group. So far as the comparison of the E_{ts} group with the C_s group was concerned, the hypothesis was verified. However, it was found that the difference between the E_s group and the E_{ts} group did not strongly support the hypothesis. This can be accounted for by the same reason given above, namely, that the E_s group might not have experienced repression.

In order to have supported the third hypothesis which was concerned with the effect of the introduction of unpleasantness associated with a particular symbol on a subsequent and neutral soluble problem, the results should

have indicated no significant difference between the C_t and E_t groups. However, the obtained results did indicate a significant difference between these two groups. The results should also have indicated a significant difference between the E_t and E_s groups. The obtained results showed that not only was there no significant difference between these two groups, but also that the trend was in the opposite direction, with the E_t group requiring more trials to solve the related problem. These deviations from the hypothetical expectations have been explained on the basis that the E_t group may have generalized the unpleasantness from an association with the small figure to an association with height.

Farber (2) offers some relevant material in connection with the E_{ts} group which received the explanation of the insoluble problem in Session II. He states that, "......behavior under shock conditions may become highly rigid and resistant to extinction, even though alternative responses are made to have greater value in terms of reward....." (2 p. 113) Also, Maier (7) has suggested that, "......what is conventionally called the 'learning function' actually often involves processes other than learning. Such extraneous processes include the 'tendency to persist in an acquired mode of behavior after it ceases to be adaptive'." (7 p. 114) According to Farber's analysis,

rats that were shocked at a choice point of a t-maze and were later fed at that choice point, required fewer trials to give up a habit than animals which were shocked but not fed. The relative rigidity of the latter group was due to the reinforcing effect of the relief of anxiety to shock which was effected when the animals' response was made. Likewise, the group which was fed at the choice point had their anxiety directly diminished, thus obviating the necessity for other adjustive processes. In the present study, explaining the source of unpleasantness may have precluded the necessity for rigid behavior the strength of which would be due to the reinforcing effect of anxiety reduction. It remains for further research to clarify the relationships between this mechanism and the mechanisms of repression.

Although no mention was made in the original hypotheses of analyzing response latencies, a comparison was made between the reaction times of the soluble problem in Session I and the reaction times of the two problems in Session II. According to the work done by Tolman (16) and Smith (14) in which they found that reaction time increased with unpleasant tasks, it was expected that the response latencies would increase during the insoluble problem. The results did support their findings, in that they showed a significant increase during the insoluble

problem and a subsequent decrease during the final soluble problems. These findings further suggest that response latencies should be considered in any analysis of repression, since they serve as an index of the degree of unpleasantness or unpleasantness of the material to the subject.

It was also found that the cards which contained two short figures did not indicate any unique difference in response latency as compared to the other cards in the insoluble problem. This finding again does not support the basic postulate that punishment was consciously or unconsciously associated with the shorter figure.

An alternate experimental design for the analysis of repression may be adapted from the one in the present study which would clarify the effect of generalization. In this design there would be four groups of subjects. In Session I, all subjects attempt to learn a soluble discrimination problem in which the solution is the selection of the wider of the two figures on each card. in Session II, Part A, groups I and II receive shock every time a short figure appears on the stimulus card, and groups III and IV receive shock every time a tall figure appears on the card. Following a short time interval,

groups I and III learn to pick the short figure, and groups II and IV learn to pick the tall figure. Then, the differences between the groups in learning the final soluble problems could be analyzed so that a cross check could be run on the factor of generalization. Schematically, this design may be represented as follows.

Group	Session I	Part A	Session II	Part B
I	Soluble problem Select wider figure	Insoluble problem Shock short figure		Soluble problem Learn short
II	Soluble problem Select wider figure	Insoluble problem Shock short figure		Soluble problem Learn tall
III	Soluble problem Select wider figure	Insoluble problem Shock tall figure		Soluble problem Learn short
IV	Soluble problem Select wider figure	Insoluble problem Shock tall figure		Soluble problem Learn tall

In conclusion, it may be said that the present study contributes to the development of a technique for analyzing repression. Further experimentation using variations of this design may yield more conclusive answers to the problem.

BIBLIOGRAPHY

Bibliography

1. Colgrave, F. W. Individual Memories. Amer. J. Psychol., 1898-1899, 10, 228-255.

2. Farber, I. E. Response Fixation under Anxiety and Non-anxiety Conditions, J. Exp. Psychol., 1948, 38, 111-131.

3. Gordon, J. A Study of early memories. J. Delinqu., 1928, 12, 127-132.

4. Huston, P. E., Shakow, D. and Erickson, M. H. A Study of hypnotically induced complexes by means of the Luria technique. J. gen. Psychol., 1934, 11, 65-97.

5. Kowalewski, C. Studien zur Psychologie des Pessimismus, Wusbaden, 1904.

6. Lindquist, E. F. Statistical Analysis in Educational Research., Boston: Houghton Mifflin Co., 1940, 21-29.

7. Maier, N. R. F. The Specific Processes Constituting the Learning Function. Psychol. Rev., 1939, 46, 241-252.

8. Marquart, D. I. The pattern of punishment and its relation to abnormal fixation in adult human subjects. J. gen. Psychol., 1948, 39, 107-144.

9. Ratliff, M. M. The varying function of affectively toned olfactory, visual, and auditory cues in recall. Amer. J. Psychol., 1938, 51, 695-699.

10. Rosanoff, A. J. Manual of Psychiatry and Mental Hygiene. John Wiley and Sons, Inc., N. Y., 37, 562, 712.

11. Sadler, Theory and Practice of Psychiatry. C. F Mosley Co., St. Louis, 1936, 69.

12. Sears, R. R. Functional abnormalities of memory with special reference to amnesia. Psychol. Bull., 1936, 33, 229-274.

13. Sears, R. R. Initiation of the repression sequence by experienced failure. J. exp. Psychol., 1937, 20, 570-580.

14. Smith, W. W. Experiments on memory and affective tone. Brit. J. Psychol., 1921, 11, 236-250.

15. Thompson, R. H. An experimental study of memory as influenced by feeling tone. J. exp. Psychol., 1930, 13, 462-467.

16. Tolman, E. C. Retroactive inhibition as affected by conditions of learning. Psychol. Monogr., 1918, No. 107, 187-195.

17. White, R. W. The Abnormal Personality. The Ronald Press Co., N. Y., 1948, 37, 239-241.

18. Young, K. Social Psychology. F. S. Crofts and Co., Inc., N. Y., 1947, 127-128.

19. Zeller, A. F. An experimental analogue of repression I. Historical Summary, Psychol. Bull., Jan., 1947, 39-51.

20. Zillig, M. Einstellung und Aussage. Z. Psychol., 1928, 106, 58-106.

APPENDIX

The Figures Used in Session I

N - narrow	S - short	4 - 4-sided
M - medium	M - intermediate	5 - 5-sided
T - tall	T - Tall	6 - 6-sided

* - Figure receiving shock

Card No.

Card No.	Left Hand Side of Card	Right Hand Side of Card
1	* NT4	NS5
2	NS5	* MT6
3	* MS4	MT5
4	ST4	NM6
5	MT4	MS6
6	* NM4	NS6
7	NM4	MT6
8	* NM5	ST4
9	* NM6	MT4
10	NS6	* NM4
11	MM5	* MT4
12	* MS6	MT4
13	* MT6	NM6
14	NM5	* NS5
15	* MT5	MM4
16	* MT6	NS4
17	MT6	* NM4
18	MT6	* NS5
19	NM6	*NM4
20	* MS6	MT5
21	MS4	* MT5
22	* NM4	MT5
23	NM6	* MM6
24	* NM 5	MM6
25	MS4	* MT6
26	MS5	* NM6
27	* NM5	NM6
28	* MT6	NM4
29	NM6	* NS5
30	* MT4	MS5

The Figures Used in Session II, Part A

(Ineclubile Series)

* = card receiving shock

Card No.	Left	Right
1	*MT4	M5
2	M4	M4
3	* M6	MT5
4	M6	MT4
5	M5	M5
6	* M4	M6
7	* M5	M6
8	* M6	M6
9	* M4	M4
10	MT4	MT6
11	M5	MT6
12	M6	M5
13	M6	MT6
14	MT5	MT4
15	* M4	M6
16	* M5	MT4
17	MT6	M4
18	* M4	M6
19	* MT6	M5
20	MT4	M5
21	MT6	M5
22	MT4	MT6
23	MT5	M6
24	M4	MT5
25	* M5	MT6
26	* MT5	M6
27	* M6	M4
28	* MT5	M4
29	M5	M4
30	* M6	M4

The Figures used in Session II, Part B

* - shock for Neutral Problem (Pick Taller)
* - Shock for Relate. Problem (Pick shorter)

Card No.	Left	Right
1	* WT5	
2		
3	*	
4		
5		*
6		*
7		*
8		*
9	* WT4	
10		
11		*
12	*	*
13	*	
14		
15	*	*
16	*	
17		*
18		*
19		*
20	*	
21		*
22	*	
23		*
24	*	
25		*
26		*
27	*	
28	*	
29		*
30	*	

Acknowledgements

The author wishes to express her appreciation to Dr. Claude C. Neet, Dr. Maxwell Goldberg, and Dr. J. G. Snedecor for their valuable criticisms and suggestions, and to Mr. Robert S. Feldman who suggested this problem and who served as official advisor for the study.

Appreciation is also expressed to the author's brother, Mr. Frank S. Raphael, who designed and drew the stimulus cards and graphs, and to Mr. Joseph Mach for his assistance in the construction of the apparatus.

Approved by

James J. Swedeen

Maxwell H. Goldberg

Claude C. Specht

Date

June 1, 1950