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Recall on incompleted and completed sentences by weak and strong ego strength subjects under ambiguous and relaxed conditions.

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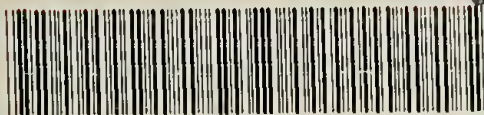
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RECALL OF INCOMPLETED AND COMPLETED SENTENCES
BY WEAK AND STRONG EGO STRENGTH SUBJECTS
UNDER AMBIGUOUS AND RELAXED CONDITIONS

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A problem submitted to the faculty of
the University of Massachusetts in partial
fulfillment of the requirements of the
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of Psychology

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CHAPTER I

REVIEW OF THE LITERATURE

The early experimental literature concerned with the recall of incompletd and completed tasks was an attempt to validate Lewin's (1940) hypothesis that interrupted tasks tend to persist in memory until completed. In a population unselected as to personality factors Zeigarnik (1927) and Marrow (1938) found that subjects tended to recall more incompletd than completed tasks under neutral conditions. Lewis and Franklin (1944) found the opposite, greater completed than incompletd task recall under relaxed conditions. Rosenzweig (1934) elaborated and added to the original conception by positing that under stressful conditions differential recall would reveal repressive tendencies. According to Rosenzweig, the incompletd items under ego-involving conditions were frustrating and subsequently would be "repressed" by certain individuals who tended to act in an ego-defensive manner. A comprehensive review of the repression and defense theory as it relates to selective memory has been presented by Goldin (1964), and the theoretical and practical difficulties in the area of incompletd and completed task recall has been presented by Butterfield (1964).

Accepting Rosenzweig's (1943) basic orientation, Alper (1946, 1948, 1957) explored individual differences in recall tendencies under various experimental conditions. Eriksen (1952, 1954) continued in this direction as he attempted to study ego strength in relation to the recall of incompleted and completed tasks under neutral and stress conditions. Both Alper and Eriksen found a consistent relationship between the above mentioned variables. In general, strong ego subjects tended to recall more completed than incompleted tasks under the stress condition yet more incompleted than completed tasks under neutral condition. On the other hand, weak ego subjects tended to recall more incompleted than completed tasks under stress conditions yet more completed than incompleted tasks under neutral conditions.

Alper (1948) offered the following explanation for the above findings. Strong ego subjects are able to recall more incompleted than completed tasks under relaxed conditions because they do not find the incompleted tasks threatening and thus have no need to defend themselves by repressing the items. The subjects are demonstrating the healthy need persistence reaction that Zeigarnik (1927) postulated to be universal. Under stress, the strong ego subjects recall more completed than incompleted tasks because they are able to focus attention on their successes when realistically threatened by failure. On the other hand, the weak ego

subjects recall more completed than incompleting under neutral conditions because they have a need to defend themselves against the failure of not completing some of the items. They need to protect their self-esteem even when the threat is objectively minimally present. Under stress, the weak ego subjects recall more incompleting than completed, an indication of a "readiness to admit defeat" (Alper, 1948) and a tendency to blame themselves intropunitively for their failure to complete the items.

Despite the general tendency in recall behavior as reported above, there have been a number of conflicting results reported in the literature (Smock, 1957; Lewis and Franklin, 1954; Zeigarnik, 1927). Also various review articles have brought to light the various inconsistencies within the area of selective memory and defense (Glixman, 1948; Goldin, 1964; Butterfield, 1964). These conflicts are especially apparent when considering populations of subjects unselected for personality variables. Under stress conditions, the findings are somewhat at odds with each other (Butterfield, 1964). Similarly, the results under neutral conditions as reported over the years are in considerable conflict.

The fact that findings are heterogeneous under neutral conditions might be partially due to the fact that neutral as defined by each experimenter has differed in important ways. Some neutral instructions are short and ambiguous, as

exemplified by Zeigarnik (1927) and Marrow (1938), and subjects might perceive them as threatening and would act accordingly. On the other hand, in other studies, the neutral instructions have been relaxed to the point of minimal threat and maximal reassurance as exemplified by Smock (1957). Under such relaxed conditions, subjects might react in a way that would be more congruent with the assumption of "non-threatening" conditions.

It is further noted that individuals who differ in emotional stability will perceive and react to an external condition involving some degree of stress in characteristically divergent ways. Consider the two extremes. A stress condition that might be minimally threatening to an emotionally stable person may be quite threatening to an emotionally unstable person. Similarly, a neutral condition might be neutral for the stable person yet threatening to the unstable person. When assessing reactions to experimental conditions, it seems necessary to know what subject variables (ie., emotional stability) are involved. Grouped data, which does not take into account personality variables, tends to cancel any opposing effects that subjects of differing stability manifest. This is a major criticism of the work of Zeigarnik (1927) and Marrow (1938) who attempted to find universal effects in recall behavior.

The conflicting results with respect to the recall of tasks seem related to three aspects of methodology which vary from study to study: the nature of the stimulus material, the variability of the subject population, and the nature of the instruction. Each is treated separately in the subsequent sessions.

The Nature of the Stimulus Material

In previous studies a variety of stimulus materials have been employed ranging from game-like tasks to more intellectual-like tasks. It is felt that the different findings with respect to recall could partially be explained as the result of the task having more or less threat intrinsic to itself.

The early studies of Marrow (1938) and Zeigarnik (1927) employed game-like tasks like "name the forty-eight states," "string the beads on a string," etc. Both investigators found that groups unselected for personality variables tend to recall more incompleting than completed tasks. Later studies (Lewis and Franklin, 1944; Smock, 1956) found a similar relationship, which, at first sight, would seem to support the Gestalt need-tension theory. It is suggested that the game-like tasks involve a minimum of threat to the person attempting to complete them. Hence, subjects would

probably not interpret such tasks as being failure related and would have less of a need to defend themselves against failure related experiences by "repressing" incompleting items. According to Rosenzweig (1943), need-persistive, not ego-defensive, reactions are entailed.

The later studies (Alper, 1946, 1948, 1955; Eriksen, 1954, 1952; Zolik, 1955) adopted different materials by utilizing the scrambled sentence technique, a more cognitive and intellectual type of material. They consistently found that subjects, averaged over levels of ego strength, recalled an equal number of incompleting and completed tasks under neutral conditions. In fact, there was a tendency for the groups to recall more completed than incompleting tasks, although the difference was not statistically significant.

As a more intellectual task, scrambled sentences seem to involve a certain amount of threat intrinsic to the task even under neutral conditions. It has been shown by Butterfield (1964) that incompleting recall is the variable most subject to change with increase in stress. Reasoning analogously, even under neutral conditions, in reaction to incompleting on cognitive-intellectual material, an equal incompleting and completed task recall may indicate that subjects are displaying a tendency to an ego-defensive reaction.

The Variability of the Subject Population

The conflicting results may also be due to the fact that various studies employed different subject populations ranging from children (Smock, 1956) to adolescents (Zeigarnik, 1927; Zolik, 1955) to adults (Alper, 1955; Eriksen, 1954). Smock (1956), employing children, and Zeigarnik (1927) employing adolescents found incompleting tasks recalled more than completed tasks. This author believes that the above might indicate that children are less competitive and less concerned with intellectual failure than adults. If this is the case, children have no need to react in a defensive manner and find it easy to recall a preponderance of incompleting tasks, which for them are not as failure related and threatening as might be the case for adults. Zolik (1955), employing adolescents, found an insignificantly greater completed than incompleting task recall, which is difficult to assimilate into the above interpretation.

Both Alper (1946, 1948, 1957) and Eriksen (1952, 1954), employing college students, a population highly susceptible to intellectual failure, found a tendency for subjects to recall more completed than incompleting tasks when averaging over levels of ego strength under the "non-threatening" conditions. This may indicate that college subjects are set to react to academic-like tasks as ego-related and thus

interpret incompleteness as an instance of failure. Lewis and Franklin (1944) found similar results under neutral instructions; however, Rosenzweig (1943) and Marrow (1938) with adults found incompleteness recalled more than completed tasks, which runs contrary to the above speculation.

The Nature of the Instructions

It is suggested that various instructions employed in the previous experimental studies on recall of tasks under neutral conditions vary on a continuum of increasing degrees of stress. In general, there appear to be at least three experimental conditions; relaxed, ambiguous and stress. The previous experimental findings will be discussed in relation to the level of stress involved in these conditions.

Relaxed Conditions. The object here is to remove all threat from the experimental condition, although some authors seem closer to this goal than others. The ideal condition is modeled after Smock's (1956) approach where "if the experimenter decided a puzzle wasn't suitable, he would interrupt---by saying that 'this one is far too difficult; it takes too long---I guess I'll throw that one out in later experiments.'" This reassurance occurs subsequent to each incomplete task in order that the subjects are directly informed that they have not failed. Under these conditions, Smock (1956) found

that the incompleted tasks were recalled more than the completed tasks, as might be expected.

The above approach has rarely been employed, and the following has been assumed to be relaxing enough. Alper (1948) stated to her subjects that "I am gathering some material---some items are more difficult than others---will try it out on lots of people---don't feel on the spot for you are only serving as a guinea pig." Eriksen (1952) employed a different set of instructions which also were to be non-threatening and task-involved for the subjects. They consisted of telling the subjects that "I have dreamed up some material to keep you from rehearsing during a rest period in a learning experiment---want you to aid me in selecting the sentences which would keep subjects in the experiment occupied for the necessary length of time. Many of the sentences can not be solved within the time period." Alper (1948) and Eriksen (1952) found that the incompleted recall was equal to the completed recall. In other words, there was no significant difference between the incompleted and completed recall when averaging the high and low ego strength subjects. It is suggested by the writer that had their instructions been either more "relaxed" or more "ambiguous" the overall results on recall of incompleted and completed task recall might have been substantially different.

Ambiguous Conditions. Zeigarnik (1927), Marrow (1938), and Lewis and Franklin (1944) employed somewhat curt, non-informative instructions. The subjects were not informed as to the explicit reason why the experiment was being run, and whenever they failed to complete an item, they were given no reassurance as to the level of difficulty. It is assumed that such instructions increase the probability that incompleteness will be experienced as failure and will result in less incompleteness task recall. This would be especially true of weak ego subjects, although they were not identified in the above three studies. Lewis and Franklin (1944) found that completed recall was greater than incompleteness recall, which is consistent with the author's position. If ambiguous instructions imply mild threat and failure interpretation, completed recall greater than incompleteness recall would indicate that success-recall serves as a defensive measure. However, Zeigarnik (1927) and Marrow (1938) found that incompleteness recall was greater than completed recall, evidence for the theoretical need-persistence reaction. These findings do not correspond with expectations, but it should be noted that the nature of the task (ie., game-like), the subject population (ie., adolescents), and the possibility of a generally strong ego strength group in these studies may have contributed to neutralize the effects of potential threat from the ambiguous instructions.

Stress Conditions. Under this condition, every effort is made to convince the subject that each task is capable of completion, that the test is an accurate measure of intelligence, and that all the items are easily completed by normal college students. In some studies, stooges are placed in the room in order to feign success with the insolvable items. It is assumed that intellectual failure becomes real for the subjects, and the findings seem to support this interpretation. As Butterfield (1964) pointed out, the experimental literature unequivocally indicates that stress increases the ratio of completed tasks to incompleted tasks recalled. It would seem that the subjects are recalling the success related items in preference to the failure related items.

CHAPTER II

HYPOTHESES

The previous discussion clearly indicates that there is a complex interaction between instructions, personality variables, developmental level of the subjects, and task variables. The present study will manipulate two of these variables. The recall of tasks by strong and weak ego subjects will be studied under relaxed and ambiguous conditions. Developmental level and task variables will be held constant. The following hypotheses relating Ego Strength to the recall of Completed and Incompleted sentences under Relaxed and Ambiguous conditions are offered.

1. Under the Relaxed Condition:

- A. Strong Ego Ss will recall Incompleted sentences greater than Completed sentences, which is indicative of the healthy need-persistence reaction.
- B. Weak Ego Ss will recall Completed sentences greater than Incompleted sentences, which is indicative of a defensive process whereby Ss stress the success related sentences and repress the failure related

sentences.

- C. Weak Ego Ss shall recall greater Completed sentences and fewer Incompleted sentences than the Strong Ego Ss. This is a reflection of the Weak Ego's defensive pattern as opposed to the Strong Ego's need-persistence pattern.

2. Under the Ambiguous Condition:

- A. Strong Ego Ss will recall Incompleted sentences greater than Completed sentences, which reflects the lack of change from Relaxed to Ambiguous. They are not threatened by either condition.
- B. Weak Ego Ss will recall Incompleted sentences equal to Completed sentences, which reflects the breakdown of defenses. Failure related items are no longer repressed, and the pattern of recall moves toward Incompleted sentences greater than Completed sentences, which is found under "stress" conditions for the Weak Ego Ss.

3. Completed Sentence Recall:

- A. Weak Ego Ss shall recall more Completed sentences under the Relaxed condition than under the Ambiguous condition, which reflects a breakdown in defenses, an inability to maintain the "success" items in memory since the failure related ones have become more significant.

- B. All other relationships shall be non-significant as a result of the Completed sentence variable being relatively constant in previous studies.

4. Incompleted Sentence Recall:

- A. Under the Ambiguous condition Weak Ego Ss will recall as many Incompleted sentences as Strong Ego Ss since the Weak Ego Ss have begun to feel the "stress" which brings more Incompleted sentence items into memory.
 - B. Weak Ego Ss shall recall greater Incompleted sentences under the Ambiguous condition than under the Relaxed condition. This reflects their reaction to the more "stressful" condition by admitting defeat and emphasizing the failure related items.
 - C. Under the Relaxed condition, Strong Ego Ss shall recall greater Incompleted sentences than the Weak Ego Ss, which again reflects the need-persistence versus the defensive pattern of recall.
 - D. Strong Ego Ss shall recall a similar number of Incompleted sentences under the Relaxed and Ambiguous conditions. The subtle difference in level of stress is not effective for these subjects.
5. Weak Ego Ss shall tend to recall Incompleted sentences greater than Completed sentences or Incompleted sentences

equal to Completed sentences under the Ambiguous condition as opposed to the Relaxed condition, which reflects their breakdown of defensive structure.

6. There will be no significant difference in total recall between the Strong and Weak Ego strength groups and/or between the Ambiguous and Relaxed conditions. The Strong Ego Ss recall a similar pattern in the Ambiguous and Relaxed conditions, and the Weak Ego Ss shall not vary in their total recall, only the direction of Incompleted and Completed sentences.
7. Incomplete Versus Complete Recall:
 - A. Under Relaxed conditions, Incompleted sentences equal Completed sentences since the simple effects of Incompleted sentences greater than Completed sentences for the Strong Ego Ss and Completed sentences greater than Incompleted sentences for the Weak Ego Ss shall cancel the main effects.
 - B. Under the Ambiguous condition, Incompleted sentences greater than Completed sentences since the Weak Ego Ss are recalling more Incompleted sentences and less Completed sentences. Strong Ego Ss have remained the same.
8. There will be not significant difference in total recall between the Relaxed and Ambiguous conditions.

CHAPTER III

METHODS AND PROCEDURES

The hundred volunteer college subjects (Ss) from Introductory Psychology, Spring, 1965 at the University of Massachusetts were randomly selected from a population of volunteers. Fifty Ss were randomly assigned to each of four experimental sessions. Two of the sessions were under Ambiguous instructions, and the other two were under Relaxed instructions. They were held on consecutive nights during a single weeks time. The experimental sessions consisted of a general orientation to the situation (e.g., information about credit, confidentiality of findings, etc.) and the formal testing. The formal testing began with the administration of a group yes-no Rorschach which measured Ego Strength. It was followed by administration of eighteen scrambled sentences, a filler task of writing words beginning with the letter "t", and finally the recall of the scrambled sentences.

Subjects

Subsequent to the four sessions, the group Rorschach

scores of all Ss were scored for ego strength, and group means were computed and compared between the four sessions. No significant difference was found, and consequently, the Ss were divided into the upper and lower 24% of the scale. This resulted in twenty Ss in each of the four cells (High Ego Strength under Relaxed conditions, Low Ego Strength under Relaxed conditions, High Ego Strength under Ambiguous conditions, and Low Ego Strength under Ambiguous conditions). The eighty Ss met the additional criterion of having completed all of the items capable of completion and falling within the 18-24 year old age range of college populations.

After constituting the cells, each Ss' intelligence was determined by combining verbal and Quantitative scores of the College Entrance Examination Board. Group means were computed for the four cells, and since no statistically stable difference was found the Ss are considered equated for the intellectual factor.

Test Administration

Each of the experimental sessions was initiated by providing information concerning credit for being involved, confidentiality, etc. The experimenter (E) informed the Ss that this is part of a thesis study which is concerned with

acquiring certain information about the performance of college students. They were informed that they would be given a number of tasks to do and that the session would last a little under two hours. At this point, the formal procedure began.

Assessment of Ego Strength. The present measurement procedure derives from Eriksen (1954). Ego Strength is defined as "the individual's capacity for appraising the reasonable limits in his interpretations and perceptions of his environment." (Eriksen, 1954) The measure of Ego Strength based on the above definition consists of a group yes-no Rorschach test scored objectively for accuracy of form level according to Beck (1961). The scale is presented in Appendix A. The method of administration followed Zolik (1955) with the ten slides projected on a screen and the concept to be judged delimited with a pointer. An Ss' score on the scale was the total number of correct responses he gave. That is, his score consisted of the number of unreasonable concepts to which he had answered "no" plus the number of reasonable concepts to which he had answered "yes". Thus a high score on the scale reflects a good capacity to appraise reasonableness as here defined. It should be noted that low scores can result from either saying "no" to reasonable interpretations or saying "yes" to

unreasonable ones. For the purpose of comparison between studies it is encouraging to note that Alper (1948), using an individual clinical assessment of Ss' ego strength, Eriksen (1954), using the above scale administered individually, and Zolik (1955), using the Ego Strength Scale which was administered to the group all found similar results when measuring the recall of incompleted and completed sentences under neutral and stress conditions. The formal instructions employed in the present study were:

"In the first part, we are going to be using pictures of inkblots. This is a set of inkblots that are currently being used in analyzing personality of people. A person is given a picture of one of the inkblots and tells the examiner everything that he sees in the picture. By means of a very complicated process it is possible to describe the person's personality. However, we are interested in only certain aspects of the inkblots here and will be employing a method different from that used in analyzing people's personality.

I am going to project the inkblots one at a time on the screen; then, I am going to point out various areas in the inkblot and ask you if they could look like different objects or things. For example, I'll point out an area and say 'Could this be a ___?' I want you to look at the area I indicate and write 'Yes' beside the thing I indicated on your paper if you think it looks like the thing I suggested. If you don't think it could be or looks like the thing or object I name, then write 'No' in the blank space. Some of the concepts I am going to point out most people would agree are reasonable interpretations for that particular area. Other concepts I am going to point out most people

would agree are not reasonable interpretations or concepts for that area. However, you are to use your own judgment and if the concept looks like a reasonable one for the particular area I point out, write 'Yes', and if it doesn't write 'No'."

Scrambled Sentences. The specific sentences utilized must be selected to maximize the probability that the Ss can complete the sentences capable of completion. Eriksen (1952) reported that the use of Alper's sentences resulted in the loss of a large number of Ss because of an inability to complete the sentences capable of completion. Zolik (1955) reported that a rearrangement of the phrases of Eriksen's sentences along with the addition of several new sentences, numbering the phrases within the sentences, and lengthening the time limit to four minutes resulted in a smaller loss of Ss. The present study employed Zolik's (1955) sentences which consist of two practice, eight solvable (Completed) and eight unsolvable (Incompleted) sentences. Two of Zolik's original eighteen sentences were dropped from the study because they proved to be unreliable during the pilot study. Each sentence was printed on a separate page with the phrases numbered and the initial phrases in letters twice the size of the letters in the remaining phrases. The Scrambled Sentences are presented in Appendix B. The printed instructions and Examples 1 and 2 are presented in Appendix C. The order

of presentation for the incompleted and completed sentences was randomized to cancel any recency or order effects. A three minute time limit was utilized.

Instructions

The instructions for the scrambled sentences differed in wording and content for the Relaxed and Ambiguous conditions. The text is presented below.

Relaxed Instructions: "I'm planning some experiments for next fall and want your help in finding out the level of difficulty of the material and if the tasks can be finished within the four minute time interval. You are kind of a guinea pig who will tell me something about the materials. Your job will be to do the tasks as I have prepared them so I can find out about them. I know that some of them are far more difficult than others, and I'm trying to determine which ones to throw out for the later experiments. I'm planning to use a four minute time limit later on so we will do the same here tonight. Before we begin officially, let's try two practice items so you can get a feel of the work. Each of you has before you a booklet which contains a number of scrambled sentences and your job is to unscramble them in order to make meaningful sentences. There is one per page and I shall announce when you are to go on to the next one. Now, turn to the sample on the first page and make it into a meaningful sentence. Okay, do you all have _____? Good, let's do the next one. Etc. When I tell you to begin turn to the next page and commence. If you should complete an item before the time limit is up, put down your pencil and leave the booklet open at the same page. Please do not return to a previous sentence nor do I want you to go ahead until I

say to do so. Are there any questions? Okay, remember that I'm just trying to find out which ones to throw out for a later experiment; and as you shall find out, some of them will be too difficult to work out in four minutes."

At the end of the three minute time limit for each of the sentences which are incapable of solution, E shall reassure the Ss with, "That one is too difficult, takes too much time." This is assumed to remove any threat due to Ss failing to complete the item.

Ambiguous Instructions: "Here are some tasks that I want you to work on. Your job will be to unscramble a series of scrambled sentences. Before we begin officially let's try two practice items so you can get the feeling of the work. Are there any questions? Okay, turn to page two and begin."

After the completion of the scrambled sentences, all groups were given a five minute interim task which maintained uniform effects and the subject's recent memory tendencies.

The instructions were as follows:

"The next task is a short word fluency test. You are to write down all the words that you can think of that begin with the letter "t". Work as rapidly as possible. There will be a five minute time limit."

Upon completion of the filler task, the Experimentor announced:

"The last test is a memory task. I want you to write down as many of the titles of the sentences as you can recall. If you can't remember the

exact title, write down the idea of the sentence, what the sentence was about."

Five minutes were allowed for the recall period.

CHAPTER IV

RESULTS

Recall of Incompleted (I) and Completed (C) sentences was the measure obtained for the eighty subjects (Ss). There were two experimental conditions of Ambiguous and Relaxed instructions, and within each condition there were twenty High Ego Strength and twenty Low Ego Strength Ss. These scores are presented in Appendix D. Four separate analyses of variance were computed for the I, C, $\frac{I}{I+C}$, and I+C variables respectively. A Lindquist (1953) 2 X 2 design was employed. The means and standard deviations for the dependent variables, Incompleted and Completed sentences, as recalled by the High and Low Ego Strength groups under the two experimental conditions are presented in Table 1.

Separate correlations between Ego Strength and the dependent variables under the two conditions were computed, and the results are presented in Table 2.

To better assess the recall of Completed sentences in relation to Incompleted sentences as they relate to Ego Strength and experimental conditions, the "T" test technique was employed. In order to do this it was first determined

Table 1

Means and Standard Deviations of Completed, Incompleted,
Ratio of Incompleted to Total, and Total Sentences
Recalled by High and Low Ego Strength Groups
under the Ambiguous and Relaxed Conditions

Ambiguous Condition

	<u>Completed</u>	<u>Incompleted</u>	<u>Ratio</u>	<u>Sum (C + I)</u>
High Ego	2.95	1.80	36.40	4.75
Strength	1.24	1.08	20.20	1.21
Low Ego	3.20	2.55	43.70	5.75
Strength	1.44	1.07	19.30	1.37
Sum (C + I)	6.15	4.35		
	1.37	1.08		

Relaxed Condition

	<u>Completed</u>	<u>Incompleted</u>	<u>Ratio</u>	<u>Sum (C + I)</u>
High Ego	3.05	2.05	35.10	5.10
Strength	1.12	1.47	21.83	1.38
Low Ego	2.75	1.85	33.85	4.60
Strength	.89	1.65	22.70	1.52
Sum (C + I)	5.80	3.90		
	.98	1.60		

Table 2

Pearson Product Moment Correlations of Ego Strength and the
Independent Variables of Incompleted, Completed, and
Ratio of Incompleted to Total Sentences Recalled
under the Ambiguous and Relaxed Conditions*

	Ambiguous	Relaxed
Incompleted	-.17	.04
Completed	-.10	.14
Ratio	-.11	.03

*All Correlations Non-significant ($P > .2$)

that there was homogeneity of variance between the four major cells by the use of Hartley's F_{\max} (Winer, 1962). The difference between the largest and smallest variance did not exceed a value significant at the .01 level. Consequently, the pooled within error variance, based on 152 df, was used to test the difference between the various means. This method follows Lindquist (1952).

Completed Sentence Recall

A 2 X 2 analysis of variance (Lindquist, 1953) was performed on Completed sentence recall, and the overall results are presented in Table 3. Neither the main effect of Ego Strength nor the main experimental condition (Ambiguous and Relaxed) effect was significant. The interaction of Ego Strength X Experimental Condition was not significant ($p > .2$). Analyses of simple effects were undertaken for exploratory purposes, and only one comparison approached a statistically significant level. There was a tendency for the Weak Ego Strength group to recall more Completed sentences under the Ambiguous condition than the Weak Ego Strength group under the Relaxed condition ($p < .25$). This suggests a slight tendency for the Weak Ego subjects to increase

Table 3

Analysis of Variance for Completed Sentence Recall

Sources of Variance	df	MS	F	p
Total	79			
Between				
Ego Strength	1	.6125	.412	>.1
Conditions (A/R)	1	.0012	.008	>.1
E.S X A/R	1	1.5125	1.019	>.1
Error	76	1.4848		

their recall of Completed sentences under more "stressful" conditions. All other comparisons were non-significant. Strong Ego Strength subjects under the Relaxed condition recall the same number of Completed sentences as the Strong Ego Strength subjects under the Ambiguous condition and as Weak Ego Strength subjects under the Ambiguous condition. These results suggest that the recall of Completed sentences is relatively constant over levels of Ego Strength and levels of experimental conditions. Further corroboration for the constancy of Completed sentence recall is seen in the lack of statistically significant correlation between recall of Completed sentences and Ego Strength under the Ambiguous condition ($r = -.10$).

Incompleted Sentence Recall

A 2 X 2 analysis of variance (Lindquist, 1953) was performed on the Incompleted sentence recall, and the results are presented in Table 4. The main effect of Ego Strength was not significant, and the main experimental condition (Ambiguous and Relaxed) effect was not significant. Graphic comparison of Incompleted and Completed sentence recall when averaging over levels of Ego Strength are presented in Figure I.

Table 4

Analysis of Variance for Incompleted Sentence Recall

Sources of Variance	df	MS	F	p
Total	79			
Between				
Ego Strength	1	1.013	.536	>.2
Conditions A/R	1	1.513	.801	>.2
ES X A/R	1	4.513	2.388	>.2
Error	76	1.890		

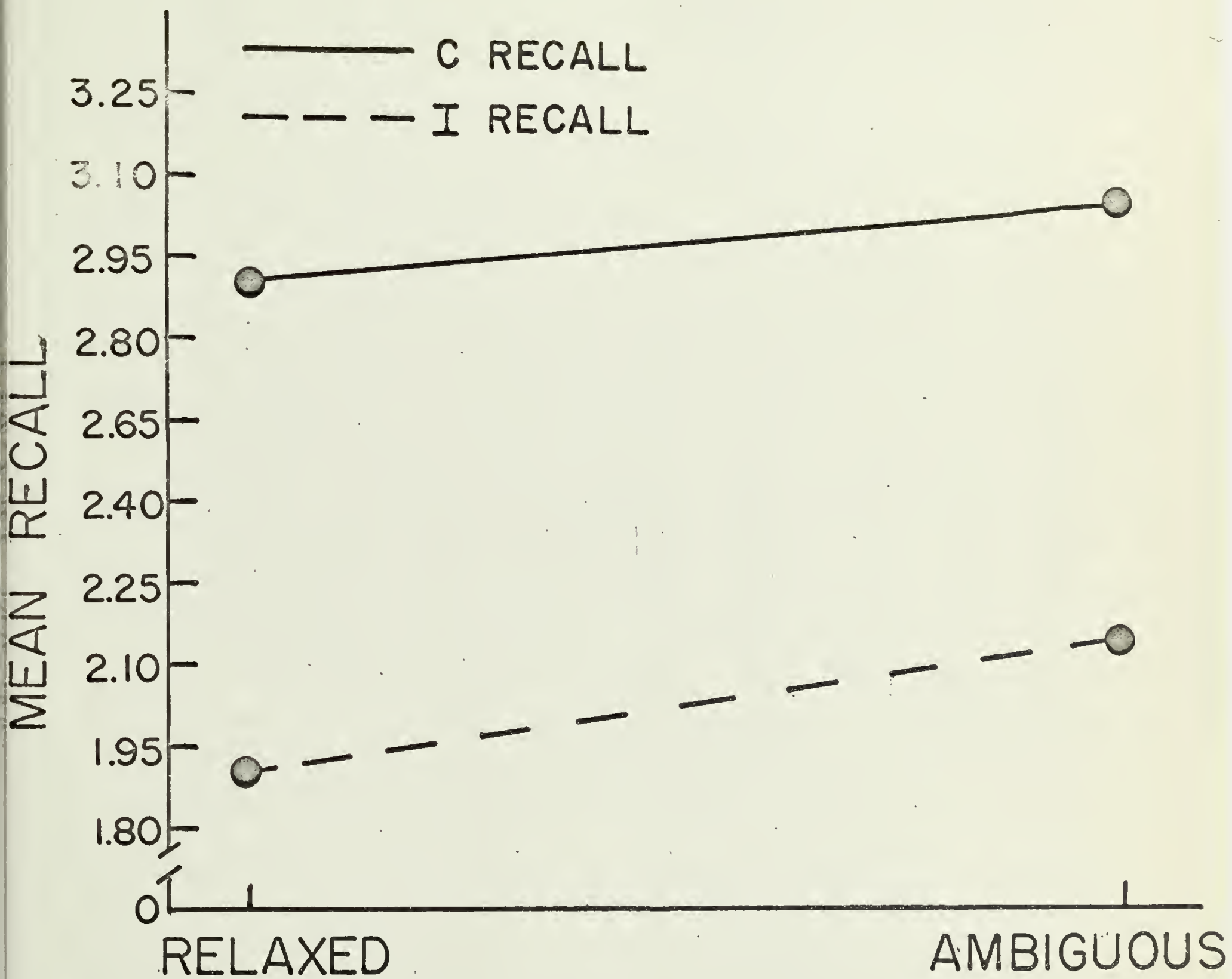


Fig. 1--Mean Number of Incompleted and Completed Sentences Recalled under the Ambiguous and Relaxed Conditions.

The interaction of Ego Strength X Experimental Condition approached statistical significance ($p < .2$). Further corroboration for the generally weak findings are the correlations of Ego Strength and Incompleted sentences under the Ambiguous condition ($-.17$), and under the Relaxed conditions ($.04$). Since the initial hypotheses were concerned with simple effects, it was decided to carry out the simple effects analysis in spite of the non-significant main or interaction effects.

The simple effects analysis indicated that the Weak Ego subjects tend to recall more Incompleted sentences than the Strong Ego Strength subjects under the Ambiguous condition ($F=2.9$, $p < .1$). Weak Ego Strength subjects under the Ambiguous condition tend to recall more Incompleted sentences than do the Weak Ego Strength subjects under the Relaxed condition ($F=2.6$, $p < .2$). These two findings suggest that the Weak Ego Strength subjects tend to emphasize or to remember a greater number of failure related sentences in the Ambiguous or "stressful" condition when compared to both the Weak Ego subjects in the Relaxed condition and Strong Ego Strength subjects in the Ambiguous condition.

When comparing Weak and Strong Ego Strength subjects under the Relaxed condition, no significant difference in recall of Incompleted sentences is found ($F < 1$). Also there

is no significant difference between Strong Ego Strength subjects in recall of Incompleted sentences under the Relaxed and Ambiguous conditions ($F < 1$). These results are shown graphically in Figure 2. The Incompleted sentences seem to be a constant variable for the Strong Ego Strength groups as they do not alter their recall pattern from Ambiguous to Relaxed conditions. As in the case of the Completed sentences, the Strong Ego Strength subjects do not react differentially with respect to Incompleted sentence recall under the Ambiguous and Relaxed experimental conditions.

$\frac{I}{I+C}$ Recall Ratio

A 2 X 2 analysis of variance (Lindquist, 1953) was performed on the recall ratio. These results are reported in Table 5. The main effect of Ego Strength was not significant ($p > .2$), and the main experimental condition (Ambiguous and Relaxed) effect was not significant ($p > .2$). The interaction of Ego Strength X Experimental Condition was not significant ($p > .2$). Correlations between Ego Strength and the ratio was not significant under the Ambiguous condition ($-.11$) nor under the Relaxed condition ($-.03$).

Although the ratio comparisons did not reach statistical significance, it was felt that a confounding of the Completed

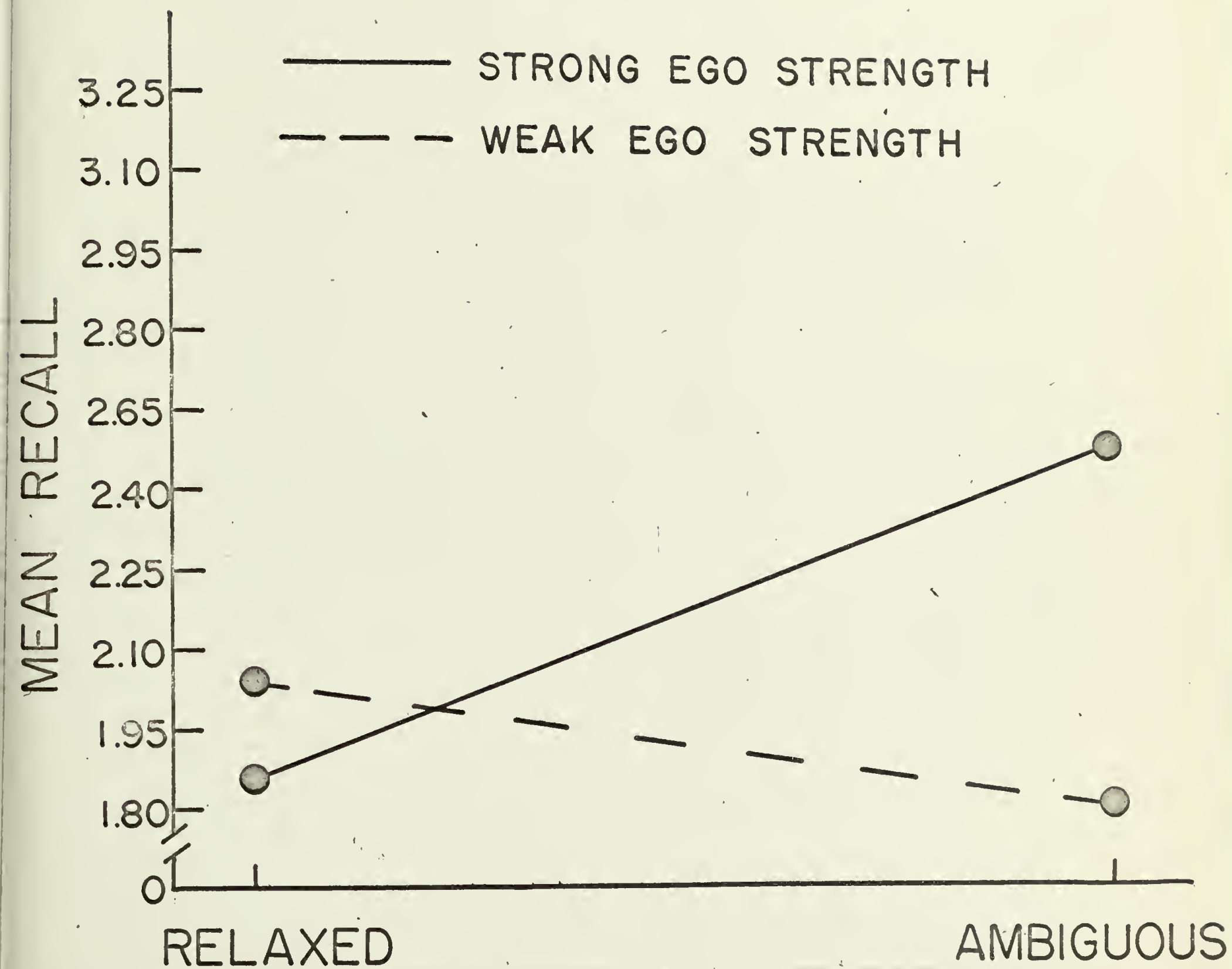


Fig. 2--Mean Number of Incompleted Sentences Recalled by Strong and Weak Ego Strength Subjects under the Relaxed and Ambiguous Conditions..

Table 5

Analysis of Variance for $\frac{I}{I+C}$ Recall Ratio

Sources of Variance	df	MS	F	p
Total	79			
Between				
Ego Strength	1	627.20	1.35	>.2
Conditions A/R	1	180.00	.39	>.2
ES X A/R	1	361.25	.77	>.2
Error	76	466.23		

and Incompleted sentence recall variability occurred which contributed to the large error variance. It can not be determined to what degree each subject's Incompleted and Completed sentence recall varied and in which direction. Only the individual analyses can determine this subtle variation. In spite of this, it is useful to note the trend for the Weak Ego subjects to recall a greater number of Incompleted sentences under the Ambiguous condition as compared to both the Weak Ego Strength subjects under the Relaxed condition and the Strong Ego Subjects under the Ambiguous condition.

Total Incompleted and Completed Sentence Recall

A 2 X 2 analysis of variance was performed on the I + C recall, and the results are presented in Table 6. Both the main and interaction effects of Ego Strength and Experimental condition did not meet statistical significance ($p > .2$). When the simple effects were explored, it was found that the I + C recall for the Weak Ego Strength subjects tended to be larger under the Ambiguous condition than under the Relaxed condition ($T = 3.88$, $p < .07$). In a similar fashion, Weak Ego Strength subjects under the Ambiguous condition tend to have a larger recall than the Strong Ego Strength subjects

Table 6

Analysis of Variance for Total Sentence Recall

Sources of Variance	df	MS	F	p
Between				
R/A	1	2.81	<1	>.2
ES	1	1.01	<1	>.2
ES X R/A	1	10.52	2.697	>.2
Error	76	3.90		

under the Ambiguous condition ($T=2.9$, $p .1$). The above findings suggest that the Ambiguous condition was more conducive to recall in general for the Weak Ego Strength subjects than for the Strong Ego Strength subjects.

In contrast, no difference in total recall was found between the Weak and Strong Ego Strength subjects under the Relaxed condition ($F<1$). In a similar fashion, Strong Ego Strength subjects do not differ in total recall under the Relaxed and Ambiguous conditions ($F<1$). As has been indicated in previous sections, the Strong Ego Strength subjects seem not to be affected by the increment in stress involved in the Ambiguous condition.

Completed versus Incompleted Effects

As a result of the large error variance of the $\frac{I}{I+C}$ sentence recall variable and the need to examine the relation of Completed sentence and Incompleted sentence recall pattern, "T" tests were run comparing Completed sentences to Incompleted sentence recall for Strong and Weak Ego Strength subjects under Relaxed and Ambiguous conditions. The procedure follows Lindquist (1953).

Relaxed

The results of the "T" tests comparing Incompleted sentence to Completed sentence recall for Strong and Weak Ego Strength subjects under the Relaxed condition are presented in Table 7. It was found that under the Relaxed condition, Completed sentences are recalled greater than Incompleted sentences by the Strong Ego Strength subjects ($T=2.41$, $p < .02$) and the Weak Ego Strength subjects ($T=2.2$, $p < .02$). These findings indicate that regardless of level of Ego Strength, subjects recall a preponderate number of success related sentences under Relaxed conditions. This data is presented graphically in Figure 3.

Ambiguous

The results of the "T" tests comparing Incompleted to Completed sentence recall for Strong and Weak Ego subjects under the Ambiguous condition are presented in Table 8. It was found that the Strong Ego Strength subjects recall a greater number of Completed than Incompleted sentences ($T=2.5$, $p < .02$). As opposed to the Relaxed condition, Weak Ego Strength subjects did not recall a greater number of Completed in relation to Incompleted sentences ($T=1.30$,

Table 7

"T" Tests of Completed Sentences Compared to Incompleted Sentences for Strong and Weak Ego Strength Subjects under the Relaxed Condition

	Means		Difference	t	p
	<u>C</u>	<u>I</u>			
Strong Ego Strength	3.05	2.05	1.00	2.4	$\leq .02$
Weak Ego Strength	2.75	1.85	.90	2.2	$\leq .02$

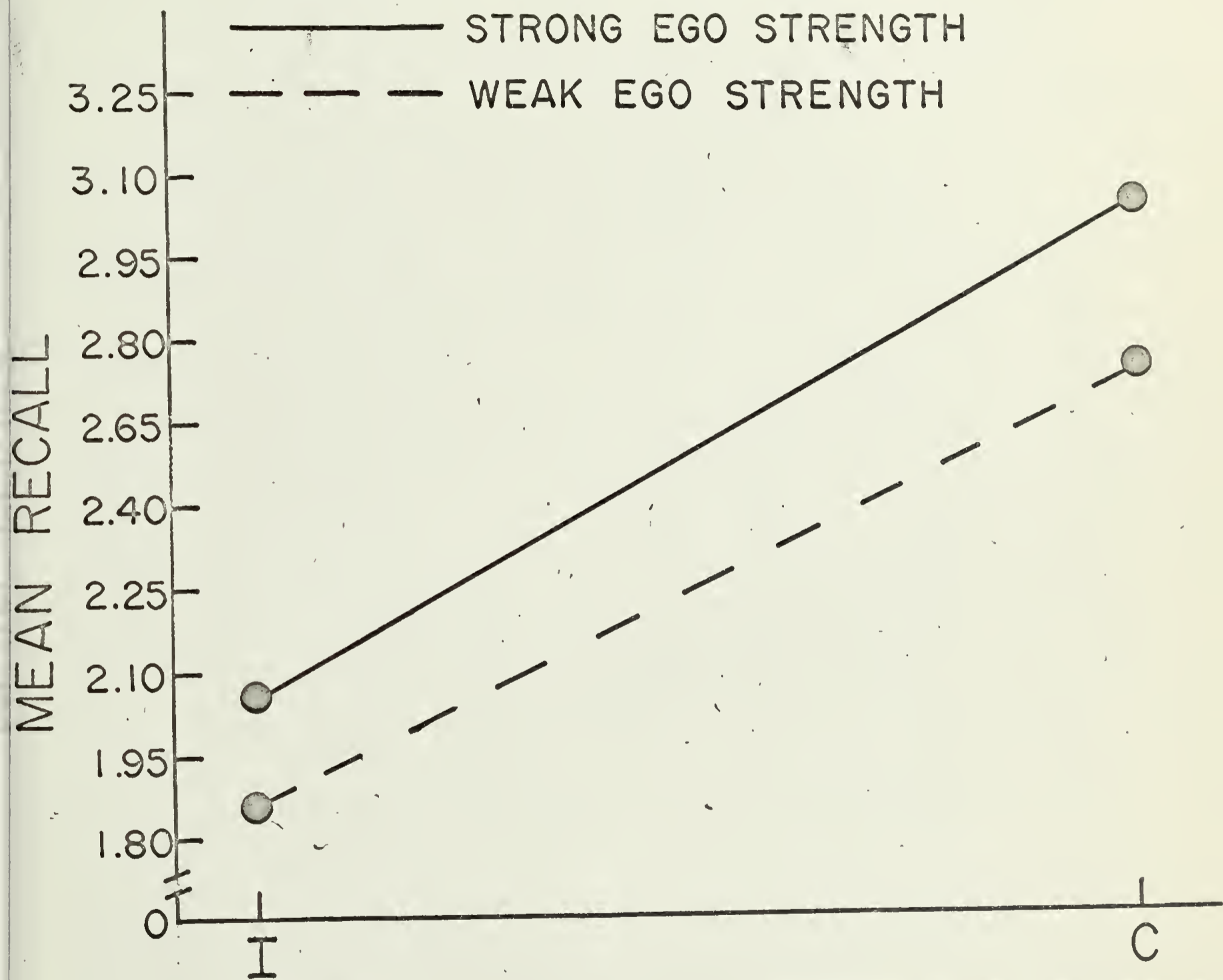


Fig. 3--Mean Number of Incompleted and Completed Sentences Recalled by Strong and Weak Ego Strength Subjects under the Relaxed Condition.

Table 8

"T" Tests of Completed Sentences Compared to Incompleted Sentences for Strong and Weak Ego Strength Subjects under the Ambiguous Condition

	Means		Difference	t	p
	<u>C</u>	<u>I</u>			
Strong Ego Strength	2.95	1.80	1.15	2.5	<.02
Weak Ego Strength	3.20	2.55	.65	1.3	<.02

$p > .2$). Taken in combination with the Relaxed condition findings, these findings indicate that the Strong Ego Strength subjects do not have different Completed versus Incompleted sentence recall patterns under the Relaxed and Ambiguous conditions. However, the Weak Ego Strength subjects do, having a recall pattern in which frequency of Incompleted sentences approximates Completed sentences under the Ambiguous condition. Thus it seems that the Strong Ego Strength subjects remain relatively constant in their recall pattern of Completed greater than Incompleted under the two experimental conditions. On the other hand, the Weak Ego Strength subjects recall more Incompleted under the Ambiguous condition which accounts for the Completed equalling Incompleted sentence recall tendency. These values are graphically presented in Figure 4.

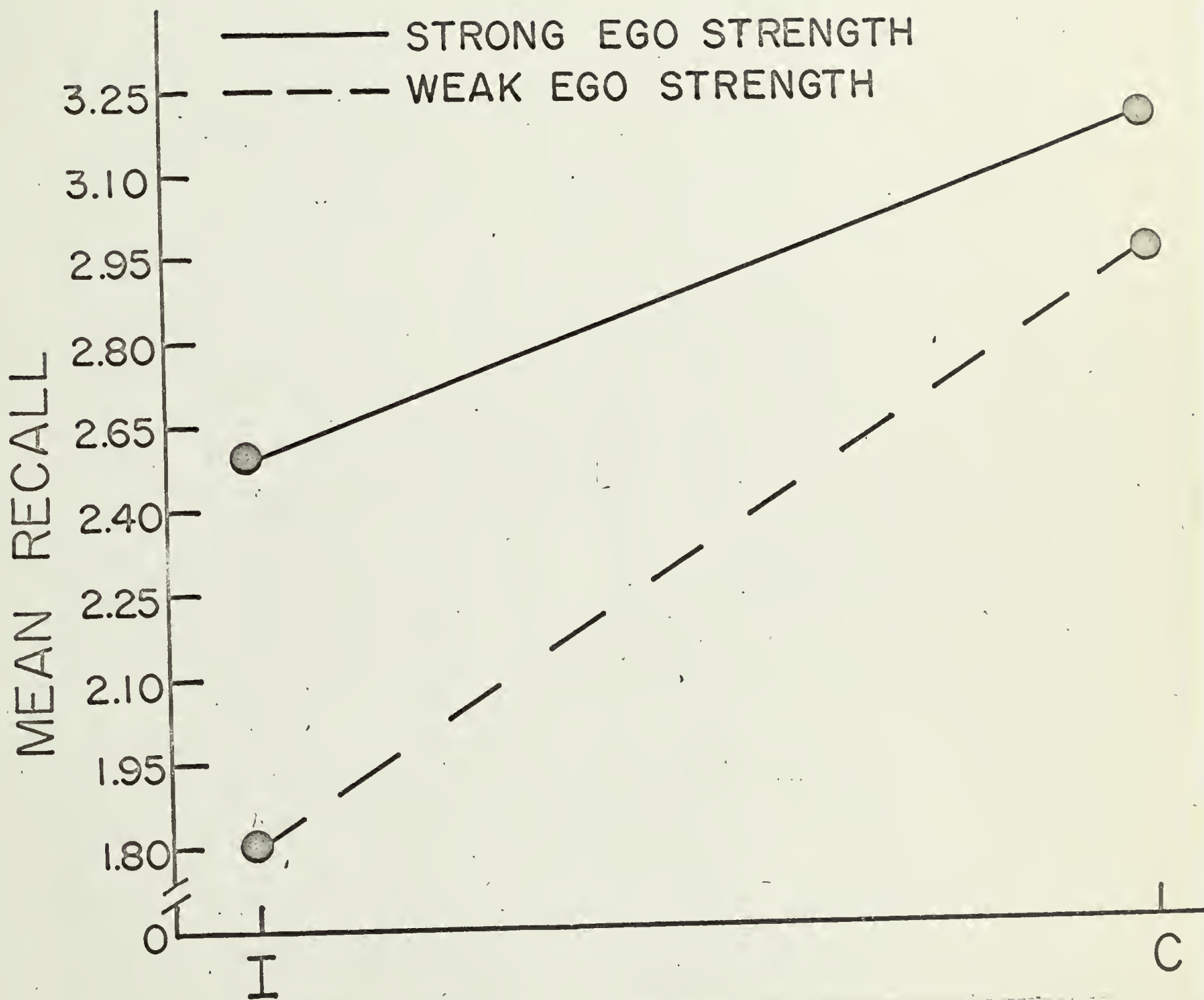


Fig. 4--Mean Number of Incompleted and Completed Sentences Recalled by Strong and Weak Ego Strength Subjects under the Ambiguous Condition.

CHAPTER V

DISCUSSION

This study demonstrated two clear cut phenomenon upon which most of the overall findings depend. Completed sentences were recalled more frequently than incomplete ones under both the Ambiguous and Relaxed conditions. Weak Ego Strength subjects increased their Incomplete sentence recall under the Ambiguous condition, whereas the Strong Ego subjects retained their Completed greater than Incomplete sentence recall pattern under the Ambiguous and Relaxed conditions.

Three basic questions related to the above findings shall be discussed below with regard to both methodological and theoretical considerations. These are: Why was the recall pattern of Completed greater than Incomplete found under both the Ambiguous and Relaxed conditions when the experimental literature unequivocally indicates that neutral instructions result in greater Incomplete than Completed sentence recall (Alper, 1946; Eriksen, 1952a, 1952b; Lewis and Franklin, 1944; Rosenzweig, 1941)? Why did the Strong Ego Strength subjects show a Completed greater than Incomplete recall

pattern in both the experimental conditions? In other words, why didn't either the Completed or Incompleted variables increase or decrease with stress? Why did the Weak Ego Strength subjects tend to increase their Incompleted sentence recall under the Ambiguous condition in relation to both the Strong Ego Strength subjects under the Ambiguous condition and to the Weak Ego Strength subjects under the Relaxed condition?

Why was the recall pattern of Completed greater than Incompleted found under the Ambiguous and Relaxed conditions?

The experimental literature beginning with Zeigarnik (1927) and Marrow (1938) reported Incompleted greater than Completed task recall under relaxed conditions. Subsequent to these findings, Alper (1957) and Eriksen (1954), using scrambled sentences instead of simple game-like tasks, reported incompleted sentence recall equal to completed recall under the various "neutral" conditions. These results were all reported on populations unselected for personality variables or at least equated for ego strength. The present study demonstrated a significant Completed greater than Incompleted sentence recall pattern under both the Ambiguous and Relaxed conditions when averaging over the two levels of Ego Strength. This near paradoxical finding may be interpreted

or explained in two ways. Both the Ambiguous and the Relaxed conditions may have been "stressful" for the majority of the subjects or certain extraneous variables entered into the situation.

This author integrates both explanations, laying more emphasis upon the first. It must be remembered that previous studies all found the direction of recall to be Completed greater than Incompleted, although this never met statistical significance (Alper, 1946; Eriksen, 1952a; Zolik, 1955). The present conditions, although not "stressful" by intent, may have been stressful enough to change the usual non-significant Completed greater than Incompleted recall pattern to a significant Completed greater than Incompleted recall pattern.

The Ambiguous and Relaxed conditions may have appeared stressful as perceived by the subjects as the result of three possible factors. The Rorschach slides were presented immediately prior to the formal Incompleted and Completed scrambled sentences test and recall period. This might have a stressful effect as the inkblots are known to arouse anxiety in even "healthy" individuals. Subjects were not totally uninvolved volunteers since they did obtain a certain amount of extra credit for their Psychology I course. Their

performance was not entirely anonymous since names were required on both the Ego Strength and Recall Booklet forms. From the foregoing it appears that there were uncontrolled factors which could have played a significant role in determining the unusual pattern of recall. Future investigations may further explore these factors in order to determine what, if any effects, they have on subject's recall patterns. Both the Rorschach and the lack of anonymity factors could be easily controlled and/or manipulated.

A second partially contributing factor which has been overlooked by all the previous investigators is a certain intrinsic common theme basic to six of the eight Completed sentences. Note the theme of history in the following Completed sentences: The Bastille; history of Western Civilization; Middle ages; medieval physician; much warmer in recent decades; and Roman Empire. The Incompleted sentences had no common thread running through them. This fact alone can account for the finding both in previous studies and this one that Completed sentence recall is a relatively constant variable between Ego Strength groups and Experimental condition (Butterfield, 1964). Also, this might account for the general finding that no consistent personality variable has been associated with the Completed task recall variable.

Should further work be undertaken in exploring various relationships between stress, personality, and recall of Incompleted and Completed sentences, it is deemed necessary to equate the stimulus sentences in terms of content. In that way, the characteristics of Completed sentence recall might become more clear and meaningful.

Thus, in summary, it would seem that all subjects (except for the Weak Ego Strength subjects under the Ambiguous condition) in both the Ambiguous and Relaxed conditions found it easier to remember those items which they had completed rather than those they did not. This would mean an emphasis upon the success related items and a de-emphasis upon the failure related items, seemingly a protective reaction under a minimally stressful condition.

Why did Strong Ego Strength subjects recall Completed greater than Incompleted sentences under both the Ambiguous and Relaxed conditions?

It was found that the Strong Ego Strength subjects recalled greater Completed than Incompleted sentences under both the Ambiguous and Relaxed conditions with no significant change in recall pattern from one to the other. This indicates a basic stability within the Strong Ego Strength subjects as they were not differentially affected by the experimental

conditions. This basic stability was an initial prediction of the study, although it was originally believed that they would recall a greater number of Incompleted than Completed sentences, not the opposite, over the Ambiguous and Relaxed conditions. An attempt has been made to explain this reversal by the presence of threat and in terms of the intrinsic common theme of the Completed sentences. Assuming that threat or "stress" is present under both conditions, Completed greater than Incompleted sentence recall is in agreement with previous studies. The overall stability of the Strong Ego Strength subjects also seems to be significant since this group would be expected to recall sentences similarly in both of these minimally "stressful" conditions.

Why did the Weak Ego Strength Subjects have an increased Incompleted sentence recall under the Ambiguous condition?

The Weak Ego Strength subjects under the Ambiguous condition tended to recall more Incompleted sentences than those Weak Ego Strength subjects under the Relaxed condition. This finding may be interpreted as indication of a breakdown of defenses, thus admitting defeat and acknowledging failure in a manner similar to Alper's (1948) hypothesis. It can also be interpreted as a result of increased motivation to recall all tasks, a hypothesis proposed by Atkinson and

Raphelson (1956). The increase in Incompleted sentence recall from the Relaxed to the Ambiguous condition was an initial prediction of this study and was based upon the "break-down of defense" interpretation.

The absense of any personality correlates relating to the recall of Completed sentences in the present study is consistent with the findings of many investigators (Atkinson, 1953; McClelland, 1951; Eriksen, 1954). On the other hand, various other studies have shown consistent findings with respect to the Incompleted sentence variable. The incompleted greater than completed sentence recall pattern or increased incompleted sentence recall was found in weak ego subjects (Alper, 1948; Eriksen, 1955) and high need achievers (McClelland, 1953; Atkinson and Raphelson, 1956). Thus high need achievers and weak ego subjects show the same increased incompleted sentence recall under stress. In McClelland's (1953) words, "stress instructions are said to be an incentive or challenge which leads to an increased approach to or recall of Incompleted tasks. It is as if the high need achiever wanted to continue to strive to complete them." Given the Ambiguous instructions, the Weak Ego Strength subjects in the present study seem to be doing just that whereas the Strong Ego Strength subjects have no need to do so. It must be remembered

that it has been found that low need achievers, as defined by laboratory conditions, are in actuality high need achievers on the outside; and the reverse is true of the high need achievers as defined by the laboratory conditions (Caron and Wallach, 1959). Thus it might be assumed that the Weak Ego Strength subjects, in the present study, are high laboratory strivers under stress, which would account for the increase in Incompleted sentence recall. As has been indicated recently (Butterfield, 1964), the relationship between ego strength, recall and need achievement should be more systematically investigated.

The above explanation may also account for the fact that the Weak Ego Strength subjects under the Ambiguous condition tend to recall more Incompleted sentences than the Weak Ego Strength subjects under the Relaxed condition. The stress is felt more under the Ambiguous condition and thus an increased recall is effected. This would also account for the initially predicted Incompleted greater than Completed sentence recall under the Ambiguous condition for the Weak Ego Strength subjects. They seem to be moving in the direction of Incompleted greater than Completed sentence recall, a pattern usually found for weak ego subjects under "stress" (Alper, 1948; Eriksen, 1954).

Thus the above data may indicate that for the Weak Ego Strength subjects the Ambiguous condition served as an energizer or added motivational force which induced increased Incompleted sentence recall. Further support for this possibility comes from the total recall data. Weak Ego Strength subjects under the Ambiguous condition tended to have a larger total recall than both the Weak Ego Strength subjects under the Relaxed condition or the Strong Ego Strength subjects under the Ambiguous condition. On the other hand, Ambiguity did not appear to serve as an additional energizer for the Strong Ego Strength subjects for they showed similar recall under the Ambiguous and Relaxed conditions.

In addition, no significant difference was found in total recall between the Ambiguous and Relaxed conditions when averaging over levels of ego strength. It was also found that no significant difference in total recall obtained between Strong and Weak Ego Strength subjects when averaging over levels of instruction. Therefore, it seems that the above findings regarding total recall point to the fact that only the Weak Ego Strength subjects made any significant change from the Relaxed to the Ambiguous condition.

Although not part of the original predictions, group differences in the filler task were analyzed in light of the

energizer or motivational hypothesis. It was found that the Weak Ego Strength subjects under the Ambiguous condition wrote down the most words beginning with the letter "t" ($p < .05$). This task served as a filler between the actual solving of the scrambled sentences and recall, and the above findings suggest an increased motivational state in the subjects to perform at a high level under the Ambiguous condition. In light of this finding and previous speculation as to the motivation factor, it is unfortunate that this was not controlled for in the present study. As a result it is difficult to ferret out the different effects of "defense" and "motivation" as they relate to the recall of Completed and Incompleted sentences. It is hoped that further research will clarify the issue.

CHAPTER VI

SUMMARY

The previous experimental literature is replete with conflicting results in the area of incompleted and completed task recall as it relates to experimental conditions. A "stressful" condition, as defined by various investigators, produces consistent results between studies. Discordant results are found when comparing findings under "neutral", "relaxed", "task-involved", or "non-threatening", instructions as defined by various investigators. This study asks the questions do subjects of high and low ego strength react differentially to conditions which have been defined as "neutral" by previous experimenters? Are Ambiguous conditions in fact "stress" conditions for some subjects?

The purpose of the study was to investigate the recall of incompleted and completed sentences under two subtly different experimental conditions, Ambiguous and Relaxed. Ego Strength was assessed for each subject. The problem was to determine the reactions of high and low ego strength subjects to the two conditions. It was assumed that the

Ambiguous instructions would be stressful for the weak ego subjects but not for the strong ego subjects. Incompleted and Completed sentence recall was the measure, which was assumed to be recall of failure and success related material respectively.

The main hypotheses were: (1) Strong ego subjects would maintain a consistent recall pattern of Incompleted greater than Completed sentences in both conditions. This would indicate the non-defensive need-persistence tendency. (2) Weak ego subjects would change their recall pattern in the direction of greater Completed than Incompleted under the Ambiguous condition. This would be a defensive forgetting of failure and remembering of success.

200 volunteer Ss were administered the Ego-Strength Rorschach scale, asked to solve 18 sentences (only 9 of which were capable of solution), asked to spend five minutes in a filler task, and asked to recall the sentences. Half of the group was given Relaxed instructions and the other half, Ambiguous. Extreme groups of high and low ego strength subjects were selected; thus the four cells had 20 subjects each. There was no significant difference between the four groups in intelligence and age.

Ambiguous instructions would be stressful for the weak ego subjects but not for the strong ego subjects. Incompleted and Completed sentence recall was the measure, which was assumed to be recall of failure and success related material respectively.

The main hypotheses were: (1) Strong ego subjects would maintain a consistent recall pattern of Incompleted greater than Completed sentences in both conditions. This would indicate the non-defensive need-persistence tendency. (2) The Weak Ego subjects would change their recall pattern in the direction of greater Incompleted than Completed sentence recall under the Ambiguous condition. This would be a partial breakdown of defenses, an admission of failure.

200 volunteer Ss were administered the Ego-Strength Rorschach scale, asked to solve 18 sentences (only 9 of which were capable of solution), asked to spend five minutes in a filler task, and asked to recall the sentences. Half of the group was given Relaxed instructions and the other half, Ambiguous. Extreme groups of high and low ego strength subjects were selected; thus the four cells had 20 subjects each. There was no significant difference between the four groups in intelligence and age.

The main results ran contrary to prediction as all subjects under both Ambiguous and Relaxed conditions recalled greater Completed than Incompleted sentences. This was explained by the fact that the conditions may have been "stressful" since the Rorschach was administered in the beginning. Secondly, the subjects were not permitted to remain anonymous. Thirdly, a common historical theme ran through the Completed items whereas the Incompleted items were random in content.

In spite of the above, it was found that strong ego subjects did in fact remain constant in their recall pattern between experimental conditions, whereas the weak ego subjects tended to change in the direction of increased incompleted sentence recall under the Ambiguous condition. This condition seemed to act as a stimulus for increased recall, and this was explained by a motivational factor. Weak ego subjects are "stressed" by the Ambiguous instructions and are moved to greater effort to achieve or perform. This is further supported by data on the filler task. It was found that weak ego subjects under the Ambiguous condition wrote more words beginning with the letter "t" than the other three groups.

It is unfortunate that the "defense" hypothesis of task recall is obscured by the "motivational" factor. It is concluded that further research in the area of Incompleted and Completed sentence recall is deemed unwise due to the numerous methodological pitfalls and to the fact that theoretical speculation is weakly grounded in conflicting empirical fact.

APPENDIXES

APPENDIX A

Ego Strength Scale; Percentage of "Yes" answers to each of 50 Rorschach concepts as reported by Eriksen; and percentage of "Yes" answers to each of 50 concepts as found in present study.

Ego Strength Scale

<u>Card</u>	<u>Concept and Location</u>	<u>Eriksen's % Yes</u>	<u>Coffey's % Yes</u>
I.1	bat W	70	79
2	fish D1	14	18
3	witch D2	75	71
4	person D3	78	50
5	man W	10	02
II.6	woman Dd24	18	41
7	two people W	85	84
8	dancer Ds5	56	56
9	dog D1	73	57
10	butterfly D3	89	83
III.11	tree D5	18	22
12	face D3	57	70
13	butterfly D3	82	93
14	two people D1	91	97
15	turkey D2	9	19
IV.16	person D1	5	8
17	man sitting WD	55	85
	on stump		
18	candle D3	28	26
19	shoe D6	99	97
20	animal skin W	82	89

Appendix A (continued)

Ego Strength Scale

V.21	bat	W	85	93
22	cat	D4	1	4
23	person's leg	D1	83	83
24	man bowing	W	8	10
VI.25	man diving	D3	38	35
26	dog's face	W	6	6
27	man's face	Ds	44	52
28	animal skin	W	70	86
VII.29	child sleeping	D10	5	16
30	river	D6	69	82
31	two women	D2	83	79
32	shrubs	W	19	24
33	frog	W	14	11
VIII.34	ribs	D3	85	94
35	two people	D1	8	15
36	rainbow	W	1	4
37	animal	D1	100	97
IX.38	two witches	D3	85	86
39	alligators	D5	30	64
40	frog	D1	8	12
41	vase	Ds8	91	92
42	boat	D6	36	58
43	man's head	D4	56	41
X.44	rabbit's head	D5	84	81
45	intestines	D11	15	28
46	crab or octopus	D1	84	98
47	flashlight	Dd24	56	81
48	two women in long dresses	D4	48	53
49	skeleton	Dds30	24	16
50	pitcher	D2	9	17

APPENDIX B

REPRODUCTION OF THE SCRAMBLED SENTENCES

Table 1

The Scrambled Sentences (Unsolvable)

"MANS NATURE" KIND OF WILD RUNS TO THE THE MORE
JUSTICE WHICH REVENGE IS A MORE OUGHT
LAW THE MORE

"INTELLECTUALLY BANKRUPT" WAS ALREADY AND THERE
STILL GREATER IGNORANCE BEFORE THE THERE WAS
THE WORLD PLUNGED IT INTO ACCOMPANYING DISORDERS

"COOLING-OFF PERIOD" INSTEAD OF HIS NECK TO DROP
BE WORTH FOUR THREE OR ICE WHILE IT MIGHT

"PETROLEUM INDUSTRY" LAST DECADE AND MELT
INCREASES IN IS THE DEAD FIRE BURNS
OUR CONSUMPTION OF THE FACT IN

Table 1 (continued)

Sentences

"SLIMY WATERS" TO BE CHERISHED FLIRTATION IS
 ONLY TO HANDLE IN WATERPLANTS LIFE THE
 WHEN CAUGHT SLIME ON MAKING AND

"THE TALE" MISSES THAT THIS LESSON CARRY TO MARRY
 A PROPER MATE I RELATE BUT PROPER TIME
 CHOSE NOT ALONE

"THE WIND" AND CAME DOWN SMOTE HIS IN WINTER WHEN
 SLANTING LINES THAT GRAND PINES IN
 OLD HARPER THUNDERHARP OF

"THE ILLUSIONS" BOTH ARE TO FUTURE NO A SYMBOL
 THAT CONNECTION WITH THINGS WILL EXAMINE THE REAL
 OF IGNORANCE SEE

Table 2

The Scrambled Sentences (Solvable)

Sentences

"ROMAN EMPIRE" POLITICAL CONTROL TO HASTEN THE
EMPEROR NERO FALL OF THE DID MUCH BY HIS LOOSE

"MUCH WARMER" IN THE RECENT DECADES
THERE IS CONSIDERABLE THAT WINTERS EVIDENCE IN
NORTHERN HEMISPHERE ARE GROWING

"REGIMENTAL ARMS" HER SOME EXQUISITE TO WRITE HIM ON
WITH HIS NOTEPAPER STAMPED HE HAS GIVEN
ESPECIALLY FOR HER

"HIS SOUL" THE BODY OF THEREBY HE LOST
COULD SEE NO THE MEDIEVAL PHYSICIAN PROFIT IN SAVING
A MAN IF

"ROUTING DEMONS" AGES THERE HOLY MAN HAD
WAS A VERY IN THE MIDDLE THE GIFT OF
WIDESPREAD BELIEF THAT A

Table 2 (continued)

Sentences

"WESTERN CIVILIZATION"

MEN SOON REALIZED
INCREASINGLY MINOR ROLE
TO PLAY AN

HORSES WERE DESTINED
IN THE HISTORY OF
THAT HENCEFORWARD

"GROW WINGS"

THEY FLEW BECAUSE
THEY MIGHT FLY BUT

IN ORDER THAT

THEY HAPPENED TO

BIRDS WERE NOT

GIVEN WINGS

"THE BASTILLE"

ABSOLUTE MONARCHY
IN FRANCE

AS THE FALL OF
BY THE CITIZENS

WAS HAILED

THE CAPTURE OF

APPENDIX C

REPRODUCTION OF THE TITLE PAGE AND PAGE 1 OF
THE SCRAMBLED SENTENCE TEST BOOKLET

Table 3

The Title Page of the Scrambled Sentences

Example 1

			NAME
¹ "FROM AMERICA"	² WAS FAR MORE	³ THE HOMEWARD PASSAGE	
⁴ THE FIRST OUTWARD	⁵ TO EUROPE	⁶ PASSAGE OF DISCOVERY	
⁷ DIFFICULT AND DANGEROUS THAN			

The correct solution is 4-6-2-7-3-1-5 which reads:

The first outward passage of discovery was far more difficult and dangerous than the homeward passage from America to Europe.

After you have solved the sentence using numbers, you are to write out the sentence in words.

Table 4

Page 1 of the Scrambled Sentence Test Booklet

Example 2

¹ "SPANISH ARMADA"	² CONTROL OF	³ THE DEFEAT
⁴ ENDED THE	⁵ OF REGAINING	⁶ CATHOLIC HOPE
⁷ OF THE	⁸ PROTESTANT ENGLAND	

The correct solution is 3-7-1-4-6-5-2-8 which reads:

The defeat of the Spanish Armada ended the
Catholic hope of regaining control of Protestant
England.

APPENDIX D

Table 5

Raw Scores for Total Sample under Ambiguous Condition

Subject*	Experimental Measures				
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	<u>ES</u>	<u>I</u>	<u>C</u>	<u>$\frac{I}{I+C}$</u>	<u>CEEB</u>
1	46	2	4	33	12
2	45	2	3	40	10
3	45	1	2	33	11
4	45	3	1	75	11
5	44	2	2	50	8
6	44	0	4	0	14
7	43	4	2	67	15
8	43	0	2	0	10
9	43	2	3	40	13
10	43	0	3	0	12
11	43	2	3	40	11
12	43	2	3	40	10
13	43	1	5	17	11
14	42	2	6	25	7
15	42	3	2	60	13
16	42	3	3	50	12
17	42	1	1	50	14
18	42	3	4	43	9
19	42	1	2	33	13
20	42	2	4	33	12
21	42	3	2	60	
22	42	2	3	40	
23	42	2	3	40	
24	41	5	4	56	
25	41	0	3	0	
26	41	0	3	0	
27	41	5	5	50	
28	41	3	4	43	

*Subjects 1-20 = Strong Ego Strength
 Subjects 65-85 = Weak Ego Strength

Table 5 (continued)

Subject	Experimental Measures			
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29	41	2	4	33	
30	41	4	4	50	
31	41	1	1	50	
32	41	2	1	67	
33	41	0	4	0	
34	41	0	3	0	
35	41	4	5	44	
36	40	3	3	50	
37	40	3	2	60	
38	40	2	4	33	
39	40	5	5	50	
40	40	4	1	80	
41	40	2	3	40	
42	40	0	2	0	
43	40	4	3	57	
44	40	3	2	60	
45	40	1	4	20	
46	39	4	4	50	
47	39	4	3	57	
48	39	5	3	63	
49	39	2	5	29	
50	39	4	4	50	
51	39	7	5	58	
52	39	0	2	0	
53	38	3	4	43	
54	38	1	4	20	
55	38	4	1	80	
56	38	2	6	25	
57	38	2	3	40	
58	38	1	5	17	
59	38	1	3	25	
60	38	2	5	29	
61	38	2	5	29	
62	38	5	5	50	
63	38	3	6	33	
64	38	2	2	50	
65	38	3	4	43	12
66	38	2	4	33	12
67	38	2	5	29	15
68	37	2	4	33	12
69	37	1	2	33	10
70	37	3	6	33	16
71	37	2	3	40	10
72	37	0	1	0	12
73	37	4	5	44	6

Table 5 (continued)

Subject	Experimental Measures					
74	37	3	3	30	12	
75	37	4	3	57	14	
76	36	4	2	67	11	
77	36	2	4	33	12	
78	36	3	0	100	11	
79	36	3	4	43	10	
80	36	4	4	50	8	
81	36	3	2	60	11	
82	35	3	2	60	14	
83	35	2	4	33	11	
84	33	3	4	43	12	
85	30	1	2	33	9	

Table 6

Raw Scores for the Total Sample Under Relaxed Condition

Subject*	Experimental Measures					
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	<u>ES</u>	<u>I</u>	<u>C</u>	<u>$\frac{I}{I+C}$</u>	<u>CEEB</u>	<u>T</u>
1	46	1	3	25	11	54
2	46	0	4	0	13	40
3	45	2	2	50	13	39
4	44	1	3	25	11	38
5	49	2	3	40	11	56
6	44	4	4	50	13	37
7	44	2	3	40	11	29
8	43	0	2	0	6	42
9	43	0	4	0	15	58
10	43	3	3	50	11	62
11	43	0	1	0	12	44
12	43	4	5	44	13	51
13	42	1	4	20	10	31
14	42	4	3	57	12	50
15	42	3	2	60	12	42
16	42	2	3	40	13	55
17	42	1	2	33	9	47
18	42	4	1	80	11	52
19	42	4	4	50	12	62
20	42	3	5	38	13	36
21	42	1	6	14		
22	42	2	3	40		
23	42	4	5	44		
24	42	3	4	43		
25	42	1	3	25		
26	41	1	2	33		
27	41	5	4	56		
28	41	1	4	20		
29	41	2	5	29		
30	41	0	3	0		
31	41	3	3	50		
32	41	3	3	50		
33	41	7	7	50		
34	41	7	3	70		
35	41	1	3	25		
36	41	2	4	33		
37	41	4	3	57		

*Subjects 1-20 = Strong Ego Strength
 Subjects 65-85 = Weak Ego Strength

Table 6 (continued)

Subject

Experimental Measures

38	41	1	4	20		
39	40	1	1	50		
40	40	3	2	60		
41	40	1	2	33		
42	40	4	5	44		
43	40	3	4	43		
44	40	2	3	40		
45	40	5	3	63		
46	40	4	2	67		
47	39	2	2	50		
48	39	3	3	50		
49	39	2	2	50		
50	39	2	3	40		
51	39	1	6	14		
52	39	0	0	0		
53	39	1	2	33		
54	39	2	2	50		
55	39	3	0	100		
56	39	0	4	0		
57	38	4	5	44		
58	38	0	3	0		
59	38	1	1	50		
60	38	3	4	43		
61	38	2	4	33		
62	38	1	4	20		
63	38	4	3	57		
64	38	1	4	20		
65	37	4	4	50		
66	37	0	3	0	11	37
67	37	0	3	0	9	27
68	37	2	3	40	10	39
69	37	0	3	0	13	36
70	37	1	2	33	6	27
71	37	6	3	67	15	65
72	36	3	2	60	8	39
73	36	1	4	20	15	42
74	36	1	2	33	12	38
75	36	0	2	0	12	48
76	36	2	2	50	15	49
77	36	1	2	33	11	57
78	36	4	4	50	12	50
79	36	4	5	44	13	25

Table 6 (continued)

Subject	Experimental Measures					
80	36	1	2	33	11	50
81	36	2	1	67	9	46
82	35	2	3	40	12	59
83	35	4	3	57	10	54
84	34	0	3	0	13	33
85	33	3	3	50	11	57

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* Incompleted
* Completed

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