VERBAL LEARNING AS A FUNCTION OF CONGRUENCY OR INCONGRUENCY BETWEEN SEMANTIC DIFFERENTIAL RATINGS OF SELF AND CVC TRIGRAMS

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Over the past 70 years, various researchers working in the field of human perception and learning have found experimental support for the hypothesis that subjects' emotional or affective predispositions tend to influence a wide variety of cognitive processes. Predispositions seen to affect these processes have included the more stable personality characteristics, such as self-esteem, and psychological needs and defenses, as well as the more fleeting phenomena such as preferences, attitudes, expectations, and mood.

Many investigations in this general area have been generated within the verbal learning laboratory and have focused on why some words, paralogs, or even "nonsense syllables are easier for subjects to acquire than others. Historically, the ease or difficulty with which verbal material was learned was seen as being due to its "meaningfulness" or lack thereof, meaningfulness being equated with an item's association value--the number of words a subject could associate to the stimulus in a given period of time (Kent & Rosanoff, 1910; Glaze, 1928; Hull, 1933; Krueger, 1934; Witmer, 1935; Noble, 1952; Mandler, 1956; Noble, Stockwell, & Pryor, 1957; and Archer, 1960). According to this theory, an item's meaningfulness and hence, memorability, varied directly with the number of associations it elicited from a group of subjects. Frequency of usage and pronounceability have also been used as indices of meaningfulness (Underwood & Schultz, 1960).

Quite a different approach to meaningfulness and its influence on the verbal learning process had its start with the work of Tait (1913). During the early decades of this century, an extensive number of articles published in the field focused on how subjects' evaluative preferences influenced the speed with which they acquired verbal material (Tolman, 1917; Smith, 1921; Chaney & Lauer, 1929; Jones, 1929; Thomson, 1930; Cason, 1932; Cason & Lungren, 1932; Bunch & Wientge, 1933; Stagner, 1933; Carter, Jones, & Shock, 1934; Silverman & Cason, 1934; White & Ratliff, 1934; Carter, 1935, 1936; White, 1936; White & Powell, 1936; Carter & Jones, 1937). According to this theory, words judged to be "pleasant" by a group of subjects would be easier to remember than those judged to be "unpleasant." This notion originated with the Freudian idea that unpleasant cognitive material (facts, memories, etc.) tends to be repressed and, hence, is less likely to be recalled than pleasant material (Metzger, 1930).

The work of Osgood and his colleagues (Osgood & Suci, 1955; Osgood, Suci, & Tannenbaum, 1957; Jenkins, Russell, & Suci, 1958) added considerable support to the idea that subjects construe the meaning of words largely around evaluative (good/bad, pleasant/unpleasant), and to a lesser extent, potent (strong/weak) and active (active/passive) dimensions. Osgood's findings inspired numerous studies investigating and comparing the relative influence of various variables (i.e., association value, frequency, familiarity, and evaluative judgments) upon the verbal learning process (Cromwell, 1956; Johnson, Thomson, & Frincke, 1960; Johnson, Frincke, & Martin, 1961; Koen, 1962; Keppel, 1963; Sarbin & Quenk, 1964; Anisfeld & Lambert, 1966; Cantor, 1968; Zajonc, 1968).

Work in the field of evaluative meaningfulness and its influence on the verbal learning process was also given a considerable boost by the appearance of a host of studies, initially published during the late 1940s but spanning two decades, which found that the perception of stimuli may be inhibited ("percep-

tual defense") or enhanced ("perceptual vigilance") as a function of the stimuli's emotional impact upon the subject (Bruner & Postman, 1947a, 1947b; Postman, Bruner, & McGinnies, 1948; McGinnies, 1949). Although focused on human perception rather than on human learning, these experiments provided significant support for the notion that cognitive processes of all kinds are influenced by subject attitudes, values, expectations, needs, and psychological defenses.

During the 1970s, continued interest in the field was demonstrated by Bower and his colleagues who found experimental evidence to support the idea that a subject's prevailing mood influences his/her memory for facts and events (Bower, Monteiro, & Gilligan, 1978; Bower & Gilligan, 1979; Bower, 1981; Gerrig & Bower, 1982). The results of these studies suggested that subjects attend to and learn more about events that match their emotional state at the time, or that subjects recall an event more easily if they reinstate, during recall, the emotion experienced during the learning process.

Concurrent with the publication of Bower's work was the appearance of studies conducted by Rychlak and his colleagues which took their initial direction from research published earlier in the century suggesting that a subject's evaluative assessment of a verbal item influenced the ease or difficulty with which he/she was able to recall or remember it. These experiments, in which subjects pre-rated their learnable material according to a four-step scale of "like much," "like slightly," "dislike slightly," and "dislike much" provided overwhelming evidence to suggest that subjects learned their liked material far more quickly and better than their disliked material (Rychlak, 1966; Flynn, 1967; Laberteaux, 1968; O'Leary, 1968; Tenbrunsel, Nishball, & Rychlak, 1968; Abramson, Tasto, & Ellis, 1969; Flynn, 1969; Rychlak & Tobin, 1971; Andrews, 1972; Rychlak, Galster, & McFarland, 1972; Tuan, 1974; Rychlak, 1975, 1977).

Other recent studies published by Rychlak and his colleagues have investigated the influence of a number of other variables upon the verbal learning process. The body of this research clearly suggests that a subject's self-esteem, mental health status, and various personality characteristics differentially affect his/her learning style (Rychlak, McKee, Schneider, & Abramson, 1971; Rychlak, Tasto, Andrews, & Ellis, 1973; Rychlak, Carlsen, & Dunning, 1974).

In one of his most recent experiments, Rychlak investigated how subjects' ratings of verbal material along Osgood's three meaning dimensions--evaluation, potency, and activity--influenced their ability to recall consonant-vowel-consonant syllables or trigrams (Rychlak, Flynn, & Burger, 1979). Results of this study suggested that evaluation was clearly influential in the learning process, but that potency and activity were not. Different results were found, however, in a recent experiment by Llanso-Cummins (1983) which was designed to partially replicate and expand upon Rychlak's work. Although beset with methodological problems which placed constraints on the interpretation of the results, the findings of this study did suggest that potency was also influential in the learning process, and that when subjects were asked to rate both themselves and their learnable material along Osgood's three meaning dimensions, they tended to acquire most easily those items which they had judged to be congruent with their self-images.

As can be seen from this brief introduction to the literature, the hypothesis that verbal learning is influenced by a number of affective variables has generated a great deal of interest and considerable experimental support. The literature review which follows will present this experimental evidence in detail, and will be focused upon verbal learning as a function of evaluative preference, mood, and personality constructs, such as self-esteem and self-image. Emphasis will be placed upon the latter, with special consideration being given to the recent work of Rychlak and Llanso-Cummins.

CHAPTER II

REVIEW OF THE LITERATURE

Part I. Verbal Learning as a Function of Evaluative Preference

The idea that the perception and remembering of external stimuli is influenced by subject preference, values, defenses, mood, or even self-image is not a new one in the history of the verbal learning literature. As early as 1913, Tait found that when presented with lists of pleasant, unpleasant, and indifferent words, his subjects remembered the pleasant words more easily than either the unpleasant or indifferent ones. Tait's findings were corroborated by a number of other early investigators (Tolman, 1917; Smith, 1921; Jones, 1929; Lynch, 1932) who used a variety of formats including free recall, immediate and delayed recognition tests, and retroactive inhibition tasks.

Although, at first, words were arbitrarily selected by the experimenters as having a positive, negative, or indifferent affectual tone, in later studies the emotional tone of words used as learnable material was established by group judgments. Efforts were also made by these investigators to try other learning formats, such as paired-associate tasks, and to control for variables such as serial position, exposure time, association value, and reliability of pleasant (P), unpleasant (U), and indifferent (I) ratings. With one exception (Chaney & Lauer, 1929), in which the P, U, and I ratings of stimulus words were determined by a panel of independent judges, these studies (Carter, Jones, & Shock, 1934; Carter,

1935, 1936; Carter & Jones, 1937; White & Ratliff, 1934; White, 1936; White & Powell, 1936) corroborated earlier results--that pleasant material is more easily remembered than either unpleasant or indifferent material.

Later experiments demonstrated an increasing sophistication of experimental technique as well as a concern for controlling extraneous variables. In the majority of these studies subjects were asked to recall or otherwise learn lists of words which had been individually pre-rated by them as to "pleasantness" or "unpleasantness." Tasks were varied to include incidental and delayed-recall formats as well as the more traditional learning and immediate recall procedures. Learnable material was equated for grammatical comparability, length, frequency of usage, and number of associates. Attempts were also made to control for primacy and recency. With one exception (Cason & Lungren, 1932), in which subjects were asked to learn lists of words which had been pre-rated by another group of individuals, the results of these studies (Thomson, 1930; Cason, 1932; Bunch & Wientge, 1933; Silverman & Cason, 1934; Stagner, 1933) unanimously confirmed earlier findings that pleasant words are more easily recalled than unpleasant words.

Interest in the area of the influence of subject preference on verbal learning appeared to diminish substantially for over a decade until the appearance of the first perceptual defense and vigilance studies (Bruner & Postman, 1947a, 1947b; McGinnies, 1949; Postman, Bruner, & McGinnies, 1948) which suggested that the perception of external stimuli is influenced not only by subject preference, but by subject defenses, attitudes, and values.

A study by Postman and Schneider (1951), although conducted within a different context from the other experiments reviewed so far in this paper, deserves mention here in view of later studies which were focused on the relationship between a subject's self-evaluation and learning style (see Rychlak, Carlsen,

& Dunning, 1974; Rychlak, Tasto, Andrews, & Ellis, 1973; Llanso-Cummins, 1983). These investigators selected 36 words meaningfully related to the six Spranger value categories: theoretical, economic, aesthetic, social, political, and religious. Three frequent and three infrequent words were chosen to represent each value category. The subject's interests in each of the categories were determined from their scores on the scales of the Allport-Vernon Study of Values (Allport & Vernon, 1931). The 36 words were first shown to the subjects in a tachistocope recognition task and later, apparently without preliminary warning, the subjects were asked to write down all the words they could remember. The mean total recall was 10.8 words. The subjects recalled significantly more words related to their most preferred value categories than to any other value category. An analysis of variance indicated that value preference was the only significant source of variance; frequency did not reach significance. Assuming that a strong preference for a particular value category involves an evaluative preference for words related to that category, the Postman and Schneider study may be taken to indicate that more positively-valued words are better learned incidentally than the less valued words.

Relevant studies conducted in more recent years have focused primarily on whether a subject's affective assessments (pleasant-unpleasant, good-bad) and the intensity of such assessments (polarization) are independent of his/her familiarity or extent of contact with a given term, or the number of associations he /she can produce to an affectively-toned word. These experiments were widely varied in format and represented a departure from the more traditional paired-associate and free recall learning tasks. Taken as a whole, their results were also varied and inconclusive. In studies in which subjects were asked to make affective assessments of words previously equated for frequency or association value (AV), high positive correlations were obtained between word or trigram

"goodness" and the other two measures of meaningfulness (Johnson, Thomson, & Frincke, 1960). High positive correlations were also found in situations in which subjects were asked to recall names and then rate them for these same variables (Cromwell, 1956). In the majority of experiments using a tachistoscope recognition format, subjects invariably reported both good and frequent words as well as words high in association value at significantly lower visual duration thresholds than bad, infrequent, or low AV words (Johnson, Thomson, & Frincke, 1960; Johnson, Frincke, & Martin, 1961). The results of these studies also yielded high positive correlations between goodness and the other two variables. In another study (Johnson, Frincke, & Martin, 1961), however, in which frequency, AV, and goodness were manipulated, words high in goodness and AV were seen to influence visual duration thresholds, but frequency was not. Experiments in which a subject's familiarity with learnable materials was manipulated by varying the frequency with which he/she was exposed to the stimuli achieved mixed results. Subjects in some studies found the more familiar stimulus to be the better one (Zajonc, 1968; Johnson, Thomson, & Frincke, 1960), while subjects in other studies reversed this trend (Cantor, 1968). In rating experiments examining the relationship between polarization and frequency and AV, it was found that polarization was highly correlated with AV but not with frequency as determined by the Thorndike-Lorge (1944) tables (Koen, 1962). Finally, in another rating study (Sarbin & Quenk, 1964), focused on the relationship between polarization and association value as determined by the Glaze (1928) and Witmer (1935) tables, no significant positive correlation between these two variables was found.

The lack of uniformity in the results of these studies may be due to any one or several of the following factors: (1) the great variety of task formats, (2) the different kinds of stimuli material used (words, paralogs, CVC trigrams, designs), (3) the lack of control over the reliability of subject ratings, (4) the fact that not

all affective assessments were made by the subjects directly involved in the study, (5) the difference in the sources used to determine frequency and association value, (6) the fact that neither frequency nor association value was directly and individually determined, and (7) formats in which subjects learned material which represented the pooled affective judgments of a group rather than their subjective assessments.

Several other studies conducted during this time period (1960s) deserve separate mention here because they fall into the more traditional verbal learning procedures (free recall, serial learning, paired-associate) used by earlier researchers. The results of these experiments indicated that both nonsense syllable and word "pleasantness" facilitated the learning of number-syllable (Keppel, 1963) and syllable-word (Anisfeld & Lambert, 1966) paired associates. However, word "pleasantness" did not appear to exert such a facilitative effect in the acquisition of number-word (Kepple, 1963), word-syllable, or word-word pairs, nor was this effect seen to be operative in experiments using a free recall or serial learning format (Anisfeld & Lambert, 1966).

One reason for the discrepancy in the findings of these researchers as opposed to those of earlier ones who used identical task formats (i.e., free recall, and word-word, word-number paired associates) is that the affective nature of the words employed in all but one of these experiments was determined from sources independent of the subjects used in the studies. Such was not the case in the experiments conducted earlier (i.e., Bunch & Wientge, 1933; Cason, 1932; Silverman & Cason, 1934; Stagner, 1933; White & Powell, 1936; and White & Ratliffe, 1934) in which subjects were responsible for judging the affective nature of the material they were asked to learn. Other weaknesses in the studies conducted by Keppel (1963) and Anisfeld and Lambert (1966) which may have differentiated their findings from those of earlier researchers (many of whom

controlled for such weaknesses) are: rating unreliability, learning material which reflected pooled rather than individual assessments of affective tone, and the use of frequency and association values from standard, independent sources.

Part II. Verbal Learning as a Function of Mood

In a recent article (Bower, 1982) Bower published the results of several studies which provide experimental support for the hypothesis that people recall an item (word, event, etc.) better if they reinstate during recall the original emotion they experienced during learning. Bower termed this phenomenon "mood-dependent memory." In gathering evidence for support of his hypothesis, Bower and his colleagues selected a group of subjects who had been determined to have high hypnotic susceptibility as measured by the Stanford Hypnotic Susceptibility Scale (Weitzenhoffer & Hilgard, 1962), induced in them a happy or sad mood, and requested them to maintain their particular mood state while learning lists of words. Six groups of subjects participated in the study. Control subjects learned and recalled two lists of 16 words each in a uniform mood, happy for one half of the control subjects, and sad for the other half. In the facilitation condition, subjects learned one list of words in one mood, learned the second list in a different mood, and then recalled the first list while in their original mood. In the interference condition, subjects acquired one list of words in one mood, learned a second list in a different mood, then recalled the first list in the mood in which they learned the second list. It was hypothesized that in the facilitation condition, subjects would recall more than the control subjects because their different learning moods isolated the two lists, thus reducing interference from list B when trying to recall list A. It was also hypothesized that in the interference condition, recall of the target list A would be hampered because the recall mood

evoked memories of the word list B rather than the target list A. The results yielded an interaction between learning mood and recall mood. That is, subjects who recalled list A while reinstated in their original mood learned their list more quickly than either of the control groups or the subjects who recalled list A while reinstated into the mood in which they learned list B.

To determine if mood-dependent memory would occur for the recall of actual events drawn from a person's emotional life, Bower and his associates had a group of 14 subjects record, in diary form, pleasant and unpleasant life incidents and rate them on a ten-point intensity scale (Bower, 1982). Subject diaries were collected and, a week later, a pleasant mood was hypnotically induced in half the subjects and an unpleasant mood in the other half. Subjects were then instructed to recall every incident they could from those recorded in their diaries. The results indicated that people in a pleasant mood recalled a significantly greater number of their recorded pleasant experiences as opposed to their unpleasant experiences, whereas people in an unpleasant mood recalled a significantly greater number of their recorded unpleasant rather than pleasant experiences. This study was replicated and similar results obtained when subjects were instructed to recall childhood incidents (Bower, 1982).

Additional research conducted by Bower and his colleagues attempted to determine if the mood-dependent memory effect would be maintained if emotions other than happiness or sadness were used in the learning and recall procedures (Bower, 1982). To investigate this, the experimenters hypnotized several groups of subjects and instructed them to learn four different word lists, each list while experiencing a different emotion, either joy, sadness, anger, or fear. After the induction of a specific mood, subjects were given two study and recall cycles per list. Their moods were then switched, and they were given a new word list to learn for two trials. After studying the four lists, subjects were

tested on the lists in the order in which they had been learned. Subjects were cued with the category and serial position of the target list, and before recalling each list, were put in one of the four emotional moods in a balanced order. Subjects were tested on one of the lists in the same mood that they had learned it in, on one list in the opposite mood from the one they had learned it in, and on two lists in moods halfway between the two opposing moods. The determination of which moods were opposite to one another or halfway between the two opposites was taken from Plutchik's theory of emotions (1980a, 1980b). Results indicated that retention was best when recall was tested in the same mood and worst when tested in the opposite mood. Furthermore, the average retention for moods classified as being halfway between the two opposing moods was approximately halfway between the best and worst retention scores.

Following his work on state-dependent memory, Bower and his colleagues conducted a series of experiments designed to test the idea that people attend to and learn more about events that match their emotional state (Bower, 1982). Bower termed this phenomenon "the mood-congruity effect." In one experiment, a happy or sad mood was induced in subjects by posthypnotic suggestion as they read a brief story about two college men engaged in a game of tennis. The events of the two men's lives and their feelings were described in the story, which was presented as a balanced third-person narrative. When the subjects finished reading the account, they were requested to tell the experimenters who they thought was the central character in the story and whom they identified with. It was found that subjects in whom a happy mood had been induced identified with the happy character in the story, thought that the story was focused on him, and believed that the account contained more statements about him. Sad subjects, however, identified with the sad character and thought that there were more statements about him. Subjects returned the following day and were asked

to recall the story in a neutral mood. The results clearly indicated that subjects recalled more facts about the character with whom they had identified: 80% of the facts recalled by the sad readers were about the sad character; 55% of the facts recalled by the happy readers were about the happy character. Bower judged these results to be an example of the mood-congruity effect rather than the mood-dependent memory effect because the subjects recalled the story in a neutral mood. These results were replicated in a second experiment (Bower, 1982) in which sad and happy moods were induced in subjects through post-hypnotic suggestion as they read a simulated psychiatric interview in which a patient described a series of unrelated happy and sad incidents from his life.

Bower's research has not been limited to an examination of the effects of mood upon memory. He and his colleagues have found that emotion plays a salient role in other cognitive processes such as free association, imaginative fantasies, social perceptions, and "snap" judgments about familiar people and objects (Bower, 1982).

Part III. Verbal Learning as a Function of Self-Esteem and Self Image

In an article published in the mid-sixties, Rychlak introduced the concept of "reinforcement value" as the evaluative assessment made by a subject of the material he/she is asked to learn in an experimental situation (Rychlak, 1966). Reinforcement value has been operationally measured by having a subject individually pre-rate his learnable material according to a four-step scale of "like much," "like slightly," dislike slightly," and dislike much" (Rychlak, 1966).

In Rychlak's typical experiment designed to test for the influence of reinforcement value upon verbal learning, subjects pre-rate a list of 140 consonant-vowel-consonant syllables or "trigrams" entitled the "Phonetic Preference

Inventory" (Rychlak, 1966), a copy of which can be found in Appendix A. The trigrams used in the inventory were selected from the 44 to 78% range of association value as determined by Archer (1960). Rychlak's purpose in constructing the Phonetic Impression Inventory was to provide a measure of control for association value while investigating the influence of reinforcement value upon learning. It was felt by Rychlak that the influence of association value across such a narrow range would eliminate its effect on the rate at which subjects learned their trigrams (Rychlak, 1966). The Phonetic Preference Inventory is usually administered on two occasions, with one hour to one week intervening between ratings. This allows the experimenter an opportunity to eliminate inconsistently-rated, and hence unreliable, material from which a subject's learnable items are selected (Rychlak, 1966). This method of controlling for the reliability of item rating was used in only one other study in the literature (i.e., White & Ratliff, 1934).

Following his initial research which provided support for the hypothesis that association value and reinforcement value are essentially orthogonal measures of meaningfulness (Rychlak, 1966; Flynn, 1967; Tenbrunsel, Nishball, & Rychlak, 1968; Abramson, Tasto, & Rychlak, 1969; Flynn, 1969; Kubat, 1969; and Tuan, 1974), Rychlak and his colleagues conducted a series of experiments investigating the influence of reinforcement value on verbal learning. This research corroborated the findings of a host of earlier experimenters in the field; that is, that liked materials are acquired more readily and remembered more easily than disliked materials. This was termed by Rychlak, the "RV-positive effect." It appeared not only in experiments using CVC trigrams as learnable materials (Rychlak, 1966; Laberteaux, 1968; O'Leary, 1968; Abramson, Tasto, & Rychlak, 1969; Rychlak & Tobin, 1971), but also in the pairing of CVC trigrams to pictorial designs (Rychlak, Galster, & McFarland, 1972), and abstract

paintings (Rychlak, 1975), in the assignment of names to pictorial designs and faces (Rychlak, Galster, & McFarland, 1972), and in the learning of actual words (Andrews, 1972).

A second major finding that emerged in Rychlak's investigations of the influence of reinforcement value on verbal learning was that while an RV facilitation effect appeared to be operative in some populations, a diminution or reversal of this effect was found in other contexts. For instance, in a study published by Rychlak, Carlsen, and Dunning (1974) using high school students as subjects and CVC trigrams as learnable materials, the Tennessee Self-Concept Scale (Fitts, 1965) was employed to divide the student population into those who had a positive self-concept versus those whose self-concept was negative. Forty subjects were thus chosen to participate in the study, 20 of whom obtained scores in the extreme high ranges of the test, and 20 of whom scored in the extreme low ranges. Since it was believed by the experimenters that poor students might have an even more negative self-concept than good students, grade point average was used as an additional variable to indicate a poor or positive self-concept. The subjects were assigned to one of four groups: high self-concept, high grade point average; high self-concept, low grade point average; low self-concept, high grade point average; and low self-concept, low grade point average. The CVC trigrams employed in the study were drawn from the 40 to 70% range of Archer's (1960) norms. They were rated for reinforcement value by the subjects on two occasions, 48 hours apart. Lists of ten reliably-rated trigrams were constructed for each subject, five of which he/she had rated as liked, and five as disliked. After each trial presentation of a list, a subject was asked to record the ten trigrams in pencil on a standard form without concern for order of recall. The criterion of learning was one complete recording of the entire list, disregarding order. As predicted, the statistical interaction between

self-concept and reinforcement value reached significance at the .01 level. The high self-concept subjects learned their positively-rated materials more quickly than their negatively-rated materials, whereas the low self-concept subjects reversed this positive reinforcement value effect and acquired their disliked trigrams more readily than their liked trigrams. Sex was not predicted to influence the results, and no significance was found for this variable. These results were duplicated in a follow-up study (August, Rychlak, & Felker, 1975) using fifth-grade children as subjects, nouns equated for imagery, meaningfulness and frequency as learnable material, and the Piers-Harris (1964) Children's Self-Concept Scale as the pre-test instrument.

In subsequent studies, Rychlak broadened the context in which the RV positive diminution or reversal effect could be expected to appear. He and his colleagues conducted several experiments in which subjects were asked to rate themselves along a specific personality trait, say extroversion versus introversion, and were then asked to learn trigrams or other material which had been rated by other subjects along the identical dimension, i.e., in this example, as "sounding" extroverted or introverted. Rychlak hypothesized that an RV positive effect would appear when subjects were learning trigrams which reflected their own self-assessments, and that an RV diminution or reversal effect would appear when the same subjects learned trigrams which were dissimilar to their own self-evaluations. In one such study (Rychlak, Tasto, Andrews, & Ellis, 1973) 200 trigrams in the 44 to 56% range of Archer's (1960) norms were presented to 122 college students (equally divided by sex) who were asked to rate them on the basis of whether they "looked" or "sounded" masculine or feminine. One hundred trigrams, 50 of which had been rated as masculine and 50 of which had been rated as feminine by a majority of the students, were then assembled. They were presented to 40 naive female nursing students and 32 male fraternity

members who rated them for RV on two occasions with 48 hours intervening. All subjects were then put through a free-recall task in which they were asked to learn ten trigrams, five of which they had individually rated as liked, and five as disliked. These subjects had been chosen from a larger pool of 114 female nursing students and 97 male fraternity members who had been administered the M-F scale of the Minnesota Multiphasic Personality Inventory (Dahlstrom & Welsh, 1960). Students were asked to participate in the experiment and were assigned to one of four experimental groups on the basis of their scores on this instrument. Subjects of either sex were considered masculine in personality if their scores fell in the upper third of the MMPI M-F distribution, and feminine if they fell in the lower third of the distribution. Hence, the sample included a pool of masculine versus feminine males and a pool of masculine versus feminine females. Groups of ten nursing students (females) and eight fraternity members (males) performed in one of four free-recall conditions: (1) masculine personality recalling masculine trigrams, (2) masculine personality recalling feminine trigrams, (3) feminine personality recalling masculine trigrams, and (4) feminine personality recalling feminine trigrams. A free recall task followed in which the criterion of learning was two consecutive complete recollections of a list. Though the results of this study did not reach significance, they did indicate the presence of the expected trends. Masculine personality types (of both sexes) when learning "masculine" trigrams demonstrated a larger RV-positive effect than when learning "feminine" trigrams, and conversely, feminine personality types when learning "feminine" trigrams showed a larger RV-positive effect than when learning "masculine" trigrams. This effect, however, was primarily attributable to the males of the sample, as these subjects recalled their positively-rated material significantly faster than their negatively-rated material. The females showed only a slight advantage for their positively-rated trigrams.

Although not considered in this study, one result of particular significance, in view of a later work by Llanso-Cummins (1983) examining the relationship between a subject's self-image and learning style, was that "masculine" personalities demonstrated a tendency to recall their masculine-rated material more quickly than their feminine-rated material regardless of whether they liked it or not. The "feminine" personalities, however, did not exhibit such a trend, and learned their masculine-rated trigrams more quickly than their feminine-rated trigrams. When the results were broken down by sex, however, females who were assigned to the feminine personality group learned their trigrams more quickly than females assigned to the masculine personality group.

In a cross-validation study (Rychlak, Tasto, Andrews, & Ellis, 1973) 300 nouns from a high rate of occurrence (100 times per million) in the English language and 300 from a low rate of occurrence (5 times per million) were chosen from the Thorndike-Lorge (1944) norms. These nouns were administered to 78 college subjects (36 females and 42 males) who were asked to rate them on the basis of whether they "sounded" ascendant or submissive. The definitions of ascendant and submissive were taken from the Guilford-Martin Inventory (1948). Only those nouns which reached a 75% rating consensus were retained. The 250 nouns so chosen fell into one or the other of the following designations: (1) 53 high frequency, ascendant nouns, (2) 62 low frequency, ascendant nouns, (3) 66 high frequency, submissive nouns, and (4) 69 low frequency, submissive nouns. Based on their scores on this instrument, 40 subjects were chosen, 20 (10 females and 10 males) of whom were identified as ascendant personalities and 20 as submissive personalities. These 40 subjects were asked to rate the 250 pre-chosen nouns for RV on two occasions, with 48 hours intervening. Paired-associate lists were individually constructed for every subject consisting of two pairs apiece from each of the following eight combinations: (1) high frequency, ascendant,

RV positive nouns; (2) high frequency, ascendant, RV negative nouns; (3) low frequency, ascendant, RV positive nouns; (4) low frequency, ascendant, RV negative nouns; (5) high frequency, submissive, RV positive nouns; (6) high frequency, submissive, RV negative nouns; (7) low frequency, submissive, RV positive nouns; and (8) low frequency, submissive, RV negative nouns. The method of anticipation was followed, and the criterion of learning was two consecutive correct anticipations of the second noun of a pair before it made its appearance on the screen. The results yielded a significant triple interaction between personality type, word meaning, and RV. Ascendant personalities learning ascendant words demonstrated a larger RV positive effect than when learning submissive words. Conversely, submissive personalities learning submissive nouns showed a larger RV positive effect than when learning ascendant nouns. Results also indicated an apparent but not significant sex difference in the RV positive effect. That is, in the case of females, the RV positive effect was uniform across personality types. However, in the case of males, it was found that ascendant subjects learned their liked words more rapidly than their disliked words, but submissive males showed a tendency to take longer acquiring liked materials than disliked materials. Interestingly enough, the results of this study paralleled and amplified upon those of the earlier experiment, already reviewed, which examined the influence of RV across masculine and feminine personalities (Rychlak, Tasto, Andrews, & Ellis, 1973). That is, ascendant personalities whether male or female demonstrated a tendency to recall ascendant versus submissive material more easily regardless of its evaluative rating. Likewise, submissive personalities of either sex acquired their submissive material more quickly than their ascendant material irrespective of its RV value.

In yet another study (Rychlak, Carlsen, & Dunning, 1974) Rychlak hypothesized that the appearance of an RV positive or RV diminution or reversal effect

in the learning styles of individuals was dependent upon whether the meaning attached to the words or trigrams used as learnable material reflected a problem area or an area of competence for the subjects being studied. Rychlak anticipated that a subject who admitted to a "problem area" embraced in the meanings of certain words would recall these words according to a diminution of the positive reinforcement value effect or an actual reversal of this pattern (i.e., recall disliked more readily than liked words). On the other hand, if a subject considered the meanings attached to certain words to be an area of competence for him, he would recall these words according to a positive reinforcement value effect (i.e., recall liked words more readily than disliked words). These effects, moreover, would be more pronounced in subjects with low and high ego-strength, respectively. Two hundred and forty-five words from a low rate of occurrence in the English language (two times per million) were chosen from the Thorndike-Lorge (1944) word lists and submitted to 10 subjects who rated them according to either of the following meaning designations: (1) aggressive /competitive--"This word suggests having to think just about myself and to compete with others in order to go 'one up' on them for some personal advantage"; and (2) passive/ intimate--"This word suggests being close to and friendly with others to the point of trusting them in an intimate way." One hundred and fifty-six words, 72 of which had been rated by 80% of the subjects to reflect an aggressive/competitive meaning and 84 of which had been judged to reflect a passive/intimate meaning were retained for use in the experiment. Sixty-four college students (divided equally by sex) were then identified as either high or low in ego-strength based on a pretesting of 350 students who were administered the Barron's Ego-Strength Scale (1935). These subjects were also chosen because each one had admitted to having a "problem" with either the aggressive/competitive or passive/intimate area of interpersonal relations. That is, some subjects had

difficulty dealing with interpersonal aggression, and others judged being intimately at ease with other people as a serious problem. The 156 pre-chosen words were then rated by these subjects for RV in the usual fashion. Based on their ratings, a 12-word, free-recall list was constructed for each of the subjects in which half of the words were aggressive/competitive in meaning and half were passive-intimate in meaning. Three of the words in each of these designations had been individually rated by each subject as liked and three as disliked. A free recall task followed in which the criterion of learning was two consecutive recollections of a list, disregarding word order. As predicted, the results indicated that when learning competency-area words, both male and female subjects acquired their liked words more readily than their disliked words; and when learning problem-area words, subjects acquired their disliked items more readily than their liked items. These differences in learning were significant at the .05 level. The ego-strength and sex variables, however, failed to enter into any of the findings.

Leaving out the RV variable, the results again corroborate those of Rychlak's two earlier experiments examining the influence of RV across masculine and feminine personalities, and across ascendant and submissive personalities (Rychlak, Tasto, Andrews, & Ellis, 1973). That is, subjects learned the material which they had judged to be similar to their self-assessments more quickly than items judged to be dissimilar.

Based on the results of these personality-related studies, Rychlak formulated an hypothesis termed "logical learning theory" which he felt described the manner in which all people acquire knowledge (Rychlak, 1977, Chapter 8). Briefly stated, this theory proposes that items judged to be congruent with one's personal assessment are more meaningful to an individual and, therefore, easier to learn. Hence, in a learning situation, if a subject regards him/herself posi-

tively (i.e., as liked, pleasant, good, etc.) he/she will acquire most readily those materials which he/she had judged to be positive in nature. Conversely, an individual who views him/herself negatively (i.e., as disliked, unpleasant, bad, etc.) will learn more easily those items which he/she has evaluated as negative. To elaborate further upon Rychlak's hypothesis, one could also say that a subject who labels him/herself as "feminine" or "ascendant," will demonstrate an affinity for acquiring those things which he/she has also assessed to be "feminine" or "ascendant," regardless of whether he/she likes the material or not.

In the last few years, Rychlak has returned to a former interest in demonstrating that Osgood's evaluative dimension (E) is similar to, if not identical with, reinforcement value as a measure of affective meaningfulness. This possibility had been suggested to him by two earlier studies (Flynn, 1967, 1969) in which RV and E appeared to load on a common factor distinct from those loaded on by association value (AV), potency (P), and activity (A). Rychlak felt that if RV and E could be shown to influence learning in the same manner, reinforcement value would acquire the considerable evidential support, reliability, and legitimacy attributed to Osgood's evaluative measure of affective meaningfulness. In an experiment designed to test for this possibility (Rychlak, Flynn, & Burger, 1979) 64 high school seniors, evenly divided by sex, were randomly assigned to one of four experimental conditions in which they were instructed to read each trigram contained in the Phonetic Preference Inventory and rate it on two occasions with reference to one of the following dimensions: RV (like-dislike), E (good-bad), P (strong-weak), and A (fast-slow). The particular bi-polar adjectives employed to represent evaluation, potency, and activity were based upon recommendations made by Snider and Osgood (1969). Based on these ratings, a list of 12 trigrams was constructed for each subject, six of which he/she had rated at one pole (liked, good, strong, or fast) and six of which he/she had

rated at the opposite pole (disliked, bad, weak, or slow). It was anticipated that the trigrams rated "liked" and "good" would be acquired more easily than the trigrams rated "disliked" and "bad," but that no such facilitative effect would be demonstrated for either the P or A meaning dimensions. A free recall task followed in which each of the 64 subjects was tested individually. Lists were presented by memory drum, set on a four-second cycle. Three orders of list sequence were administered, to obviate serial learning effects. After each trial, a subject was handed a paper form on which 12 spaces were printed, and he/she was asked to record the trigrams just flashed by the memory drum without regard for order. The learning criterion was a subject's complete recall of an entire list of 12 trigrams on two consecutive trials. The results of this experiment revealed that subjects learned the trigrams which they had rated as liked and good more rapidly than the trigrams which they had rated as disliked and bad. These differences were significant to the .01 and .05 levels, respectively; however, subjects acquired their weak and slow trigrams more readily than their strong or fast trigrams, but this difference did not reach significance.

In a study designed as a partial replication and partial expansion of Rychlak's 1979 experiment, Llanso-Cummins (1983) had 60 female undergraduates at Oklahoma State University rate themselves on a series of 15 bi-polar adjectives using the semantic differential technique. The choice of an all female subject group as opposed to a mixed-sex group employed by Rychlak (1979) was made to simplify the statistical analysis. The adjectives were chosen on the basis of strong loadings on the three dimensions of meaning--evaluation, potency, and activity--as determined by Osgood (1957). Each meaning dimension was represented by five adjectives. Students who scored in the upper and lower tertiles on one of the three meaning dimensions were assigned to one of six experimental groups: high and low evaluative, high and low potency, and high

and low activity. Having the subject population characterize themselves on a pre-test instrument as being either high or low on these three dimensions was a departure from Rychlak's (1979) experiment and was done so that comparisons could be made between a condition in which a subject recalled items which she had judged to reflect her self-assessment, and one in which she learned items determined by her to be diametrically opposite to her personal evaluation. Each subject then made semantic differential ratings of the 140 trigrams contained in the Phonetic Preference Inventory along the particular meaning dimension most descriptive of herself. For instance, subjects in the high and low evaluative groups rated the trigrams according to whether they sounded "good" or "bad." Subjects in the high and low potency groups rated the trigrams according to whether they sounded "strong" or "weak." Subjects in the high and low activity groups rated the trigrams according to whether they sounded "active" or "passive." As the results of Rychlak's last study (1979) established that reinforcement value and evaluation were methodologically similar, RV was not used as a measure of meaningfulness in this experiment. The trigrams were rated by the subjects on two occasions, a week apart, to insure reliability of ratings. On the basis of these ratings, computer generated lists were compiled, containing six trigrams rated as congruent with a subject's self-image and six rated as incongruent. The computer program used was designed to identify and use only consistently-rated trigrams in the construction of subject lists, and to counterbalance trigrams across subject lists so that the same trigram would be acquired under congruent and incongruent learning conditions. Subjects then participated in a free recall task, in which they were individually tested. The trigrams were printed on white, unruled index cards in block letters with a black Magic Marker^{tm}. Each trigram on the subject's list of 12 was exposed for four seconds, with a one-second delay between presentations. Timing was measured by a stan-

dard stop watch. The trigrams were thoroughly shuffled between presentations so as to minimize serial learning effects. Upon the completion of a list presentation, the subject was handed a sheet of paper with 12 spaces printed on it on which she recorded as many trigrams as she could recall having seen without concern for order. Intertrial intervals were limited to 60 seconds. The criterion of learning was two, consecutive, correct recalls of the list of 12 trigrams.

Unfortunately, the computer program originally intended to generate trigram lists for the learning trials phase of this study was found to be inaccurate after the completion of the experiment. As a result of these inaccuracies, changes had to be made in the methodology. These changes were concerned with a reduction in the total number of subjects used in the study and in the number of trigrams learned by each individual.

All 60 subjects participated in the three phases of the study as planned. However, as the computer program failed to identify 12 consistently-rated trigrams for each subject, after the completion of the experiment the rating data were re-analyzed to determine which of the trigrams that each subject had learned had, in fact, been consistently rated by her prior to the learning trials. It was decided, prior to the analysis, that each subject would have to have learned at least three (rather than the planned six) consistently-rated trigrams in both the congruent and incongruent conditions for her data to be used in the study. This decision was based on a similar methodology employed by Rychlak in one of his studies (Abramson, Tasto, & Rychlak, 1969). Based upon this analysis, 19 from the original total of 60 subjects had to be dropped from the experiment. Group membership was thus reduced as follows: Low Evaluative Group--8; High Evaluative Group--6; Low Potency Group--7; High Potency Group--6; Low Activity Group--6; High Activity Group--8. If a subject had more than three consistently-rated trigrams in either condition, the trigrams used in the

data analysis were randomly selected, via a random numbers table, from the subject's pool of available items.

The data were analyzed separately for the two Evaluation, Potency, and Activity groups via two 2 x 2 split-plot analyses of variance (ANOVA). In this design, the bi-polar self ratings of the subjects constituted factor A (a between-subjects factor), and the bi-polar trigram ratings constituted factor B (a within-subjects factor). As group sizes were rendered unequal by the elimination of 19 subjects, an unweighted means solution was used.

The hypothesis that subjects would learn the six trigrams which they had judged to be congruent with their self-image faster than those which they had judged to be incongruent was partially supported by the data. Both the high and low potency groups revealed the expected learning effect; that is, these subjects learned the trigrams which they had rated to reflect their self-image faster than they learned the trigrams they had rated as opposite to their self-appraisal. This difference was significant to the .05 level. While none of the other groups' performances yielded significant interactions, all except the low evaluative group followed the expected learning trend; and the interaction between self-ratings and trigram ratings did approach significance for the two activity groups ($p < 0.10$). There was also a trend toward a main effect for factor A (self-ratings) among both the potency and activity groups; that is, the low potency and activity groups learned their trigrams faster than the high potency and activity groups.

In discussing the findings of the study, the author hypothesized that the failure of the evaluative and activity groups to show significant results may have been due to the major methodological changes that had to be made in the experiment and to the possibility that the pre-test instrument failed to discriminate between subject personalities and classified individuals incorrectly. Such a failure was traced to the possibility that some adjective descriptors used in the

scale, particularly the evaluative descriptors, were not as socially acceptable as others and were, therefore, not as likely to elicit candid self-appraisals.

Reasons for the tendency of the low potency and activity groups to learn their trigrams more quickly than the high potency and activity groups were seen as being due to the possibility that high potency and activity women are subtly at variance with their expected social roles. Such feelings as "being out of step" with expected norms may have led these women to be somewhat defensive in their learning style with the result that they found it more difficult to acquire congruently-rated material than the women who rated themselves low on these dimensions.

Rationale

The possibility that individuals may structure or frame their world along introspective lines by attending to and acquiring most easily those aspects of their experience which are congruent with their self-assessment has important implications for the understanding of abnormal human behavior and the persistence of seemingly maladaptive symptoms as well as providing strong empirical support for the use of therapeutic approaches aimed at the modification of cognitions through the correction of overly-constrictive and rigid learning styles. For instance, one of the major factors in distinguishing between various levels of adjustment or maladjustment is the ability of the individual to adapt to his/her environment, adaptability being defined here as the ability to view reality objectively with a minimum of distortion and the ability to direct goal-oriented, need-fulfilling behavior in conformance with that reality. As one begins to discount various aspects of one's experience and, in so doing, to constrict one's view of reality, one also begins to narrow behavioral options and the possibility of effective action. Many individuals who seek therapeutic aid do

so because they are "stuck"; that is, they can see no alternative to the painful situation in which they find themselves immersed. This is particularly true with regard to low self-evaluators. Rychlak hypothesized that the more an individual noticed and acquired the negatively-judged aspects of his/her experience at the expense of its positively-rated characteristics, the more negative would be his/her self-image and world view and, consequently, the greater his/her potential for maladjustment (Rychlak, Carlsen, & Dunning, 1974). For example, a low self-evaluator who feels depressed, has a poor self-image, and believes that no one cares about him/her, may tend to discount evidence to the contrary (i.e., past achievements, or the caring and supportive measures of a friend) and instead focus on negative experiences, such as the critical remarks of a spouse. Such negative experience might continue to be learned by the individual more rapidly and extensively than positive experience, with the result that he/she becomes immobilized in making any positive changes in his/her life or attitudes.

To extend this hypothesis to include people characterizing themselves along the potency and activity dimensions, one could argue that individuals who notice and acquire aspects of their experiences which they judged to be "weak" (low P descriptor) or "passive" (low A descriptor) at the expense of those which they labeled as "strong" (high P descriptor) or "active" (high A descriptor) the more constrained would be their world view and the more helpless would be their self-image. For instance, a low P individual who dislikes being dominated by a stronger spouse may disregard information on how to equalize the power in such a marriage (i.e., various assertiveness-building techniques) and instead focus on experiences which confirm his/her "weakness" (i.e., all the occasions upon which he/she defers to their spouse). On the other hand, a low A individual who is not hired for a job that he/she wants may discount information on ways he/she might have secured the position (i.e., expressing his/her interest and enthusiasm in the

job to the prospective employer) and instead focus on experiences which confirm his/her passivity (i.e., all the occasions in which he/she is excluded from a decision-making process because he/she does not "speak up." In this manner, such low potency and activity individuals would be handicapped in dealing effectively with their world.

At the extreme of the low P and low A dimensions might be individuals who are more obviously and seriously handicapped in their ability to adapt effectively to their environments. For instance, at the low end of the P dimension, one might find the dependent personality who allows others to assume responsibility for major areas of his/her life because of his/her inability to function independently or who subordinates his/her needs and desires to those of the person(s) on whom he/she is dependent so as to avoid having to be self-reliant (American Psychiatric Association, 1980). This personality type may be typical of those individuals who tolerate an abusive spouse. At the low end of the A dimension, one might find the compulsive personality who may have difficulty expressing warm emotions and forming close personal ties and who may be slow and methodical and have difficulty taking effective action due to excessive rumination, vacillation, and fear of making a mistake (American Psychiatric Asscociation, 1980). In an instance where the low P and low A dimensions overlap, one may find the passive-aggressive personality who might resist demands for adequate performance in the vocational and social areas of their life and who may express their hostility and aggression through "passive" means such as forgetfulness, stubbornness, or procrastination (American Psychiatric Association, 1980).

The same kind of constricted world views and resulting meagerness of viable options might also keep high evaluative, potency, and activity people from dealing effectively with their environment. For instance, a high self-evaluator who is a virtual "Pollyanna" (i.e., an irrepressible optimist who finds good in

everything) may have great difficulty relating to a friend who has a legitimate worry because such negative experiences are typically discounted by him/her. In the extreme, one might find the hysterical personality who relies extensively on denial and repression as mechanisms to protect him/herself from the pain of intrapsychic or interpsychic conflict. Such individuals, in their effort to avoid negative feelings or experiences, may somatisize psychological conflict and develop numerous incapacitating physical symptoms such as ulcers, migraine headaches, etc. A high P father who is very "big" and "strong" may encounter a hardship in relating to, and understanding, his "small," "weak" son because such characteristics are not salient for him. At the extreme, one might encounter the unreflective, action-oriented, and poorly-controlled individual who uses physical power to make his/her way in the world, such as the assaultive spouse abuser, or child beater. A high A individual who is very "excitable" may develop hypertensive problems because "calmness" is not a prominent feature of his/her self-image or world view. At the extreme might be the manic, characterized by over-activity, distractability, impulsivity, irritability, mood lability, and inflated self-esteem whose lack of judgment may involve him/her in activities which have a high potential for painful consequences, such as buying sprees, sexual indiscretions, or reckless driving (American Psychiatric Asscociation, 1980).

Because an individual has to conceptualize possibilities before he/she can enlarge his/her behavioral repertoire by translating possibilities into effective action, treatment planning for all these individuals might begin with the objective of helping them to cognitively enlarge their experience to include more of the dimension(s) that they typically discount or ignore. It is only then that techniques aimed at changing behavior, such as assertiveness training for the low P individual or relaxation exercises for the high A individual, might be implemented in a treatment plan. By changing their learning style, that is, by noticing

and acquiring aspects of themselves and their environment which they typically ignore, such individuals may be able to deal more adaptively with their world.

Statement of the Problem

According to the Rychlak's logical learning theory, meaningfulness is defined as congruency between an individual's self-assessment and his/her evaluation of learnable material. Those items which are meaningful to a subject are presumed to be easier to learn. In testing this hypothesis, Llanso-Cummins (1983) has subjects rate both themselves and their learnable material along Osgood's (1957) three meaning dimensions, and then participate in a free recall task in which half of the items they were asked to learn had been rated by them as congruent with their self-image and half as incongruent. Although the results of this experiment provided partial support for Rychlak's theory, major methodological problems prevented such results from being totally valid and generalizable.

The present study was designed to expand upon the work of Rychlak and Llanso-Cummins in an effort to provide further experimental support for the hypothesis that individuals acquire more easily those items which they have judged to be most like themselves. Essentially a replication of the experiment conducted by Llanso-Cummins (1983), this study also incorporated several methodological changes in an effort to improve the format and produce more valid results.

The plan of Llanso-Cummins' experiment (1983) was followed by having subjects rate both themselves and the trigrams they were asked to learn along a series of bi-polar adjectives loading heavily on Osgood's (1957) three dimensions of meaning--evaluation, potency, and activity. The trigrams were rated on two occasions, after which subjects participated in a free recall task. A male

female rather than an all female population was used, however, because the results of several of Rychlak's studies (Rychlak, McKee, Schneider, & Abramson, 1971; Rychlak, Tasto, Andrews, & Ellis, 1973) indicated differences in learning styles across sexes. The Self-Inventory Scale, the pre-test instrument on which subjects described their personalities, was also modified in an effort to make it more discriminating. A pilot study was conducted using an enlarged bi-polar adjective list loading heavily on Osgood's (1957) three dimensions of meaning in order to determine which of the adjectives exhibited the strongest tendency to distinguish between subject personalities. From the eight bi-polar adjectives used to represent each meaning dimension, the five pairs which had proved to be the most discriminating were chosen for inclusion in the final edition of the scale. The pre-test instrument was also increased from a four-point to a six-point scale in order to render it more sensitive. Subjects were asked to identify themselves by their university identification numbers rather than by name so as to increase the probability of open self-disclosure. Finally, the initial sample from which subjects were chosen to participate in the study was increased from 118 to 225 in order to increase the chances of obtaining valid representatives of the six personality types.

Hypothesis

It was hypothesized that trigrams judged to be congruent with a subject's self-assessment in terms of one of Osgood's three dimensions of meaning would be easier to recall than those judged to be incongruent. That is, an individual who rated him/herself as "good," "strong," or "fast" would demonstrate more rapid recall for trigrams rated in a similar fashion than those rated as "bad," "weak," or "slow." On the other hand, an individual who rated him/herself as

"bad," "weak," or "slow" would demonstrate a learning facility for trigrams so rated as against those rated "good," "strong," or "fast."

CHAPTER III

METHODOLOGY

Subjects

The subjects were 42 female and 42 male undergraduates enrolled at Oklahoma State University. They participated in the experiment in return for extra points in an introductory-level psychology class. They were selected from a total sample of 117 female and 108 male students who were administered the Self Inventory Scale. The subjects were assigned to one of six experimental groups. Each group was composed of 14 individuals, evenly divided by sex. Group membership was determined on the basis of a subject's placement in the distribution of scores on the Self Inventory Scale. Subjects in the upper tertile of scores in the evaluative, potency, or activity dimension of the scale were placed in the high evaluative (HE), high potency (HP), or high activity (HA) group, respectively. Subjects with scores in the lower tertile on one of these three dimensions were assigned to either the low evaluative (LE), low potency (LP), or low activity (LA) group. Subjects scoring in the middle tertile on all three distributions were dropped from the study. If a subject scored in the upper or lower tertile on more than one of the three dimensions, a coin toss determined his/her group membership. The mean age of subjects in each of the six groups was: Group I (LE)--19.8 years; Group II (HE)--19.5 years; Group III (LP)--20.3 years; Group IV (HP)--18.9 years; Group V (LA)--19.4 years; Group VI (HA)--20.2 years.

Materials and Apparatus

Self Inventory Scale

The Self Inventory Scale (Appendix B) uses the semantic differential technique to quantify self-evalutions. Fifteen six-point scales were chosen for this inventory. Each scale is bounded at either end by one of a pair of bi-polar adjectives. For example:

HARD __:__:__:__:__:__ SOFT

By the placement of an "X" in one of these six spaces, a subject indicates how descriptive either adjective is of him. Above the scales were the headings "definitely like me, somewhat like me, slightly like me, slightly like me, somewhat like me, definitely like me" to aid subjects in rating themselves. The 15 bi-polar adjectives were chosen on the basis of strong loadings on the three factors of meaning--evaluation (E), potency (P), and activity (A)--as determined by Osgood (1957). These adjectives had also proved to be the most discriminatory of 24 items used in a pre-experiment pilot study. Each meaning factor was represented by five pairs of adjectives. Good/bad, nice/awful, pleasant/unpleasant, happy/sad, and honest/dishonest were used to represent the evaluative (E) factor; hard/soft, thick/thin, strong/weak, heavy/light, and large/small were used to represent the potency (P) factor; hot/cold, active/passive, fast/slow, excitable/calm, and emotional/unemotional were used to represent the activity (A) factor. A six-point, Likert-type rating scale with no neutral choice was used in keeping with Rychlak's (1977) belief that affective assessment is never neutral.

The rating forms were photocopied on two 21.6- by 27.9-cm sheets of paper. The first sheet contained directions for the rating procedure as well as labeled spaces for the recording of informational and demographic data. The second sheet contained the semantic differential scales as discussed above. Each

scale was numbered and all 15 pairs of adjectives were randomly ordered with regard to which meaning factor they represented so as to avoid sequence effects. Each scale was also varied randomly as to how each end of the scale was labeled in regard to its positive/negative or most intense/least intense connotation. For instance, the fifth scale was labeled "hard" to "soft," while the tenth scale was labeled "passive" to "active." For scoring purposes, each semantic space represented a number from 1 to 6, with "1" representing the least positive or least intense meaning and "6" representing the most positive or most intense meaning.

Phonetic Impression Inventory (Appendix C)

The Phonetic Impression Inventory, Forms E, P, and A, uses a modification of the semantic differential technique to quantify phonetic impressions. It is composed of 140 consonant-vowel-consonant trigrams taken from the middle ranges of Archer's (1960) norms: 35 trigrams were selected from the 40th decile of association value, 34 from the 50th decile, 36 from the 60th decile, and 35 from the 70th decile. These trigrams are those used by Rychlak (1977) in his Phonetic Preference Inventory (Appendix A). Every subject was instructed to rate all 140 trigrams. Each form of the inventory contained a distinctive set of rating instructions. The directions on Form E specified that the trigrams were to be rated on the basis of whether they sounded "very good," "moderately good," "slightly good," "slightly bad," "moderately bad," or "very bad." Form P stated that the trigrams were to be rated on the basis of whether they sounded "very strong," "moderately strong," "slightly strong," "slightly weak," "moderately weak," or "very weak." The directions on Form A indicated that the trigrams were to be rated on the basis of whether they sounded "very active," "moderately active," "slightly active," "slightly passive," "moderately passive," or "very passive." The bi-polar adjectives selected for each set of rating instructions

were taken from Osgood's (1957) tables as those loading most heavily on the three factors of meaning--evaluation (E), potency (P), and activity (A).

All trigrams were rated via a six-space, Likert-type scale with no neutral choice. Each scale was bounded at either end by one of the pairs of bi-polar adjectives discussed above (good/bad, strong/weak, active/passive). Only one pair of adjectives was used throughout each form of the inventory. By the placement of an "X" in one of the four spaces, a subject indicated what meaning the trigram had for him/her. Above each of the six spaces were appropriate headings to aid a subject in rating the trigrams. For example, on Form E of the inventory the headings were: VG (very good), MG (moderately good), SG (slightly good), SB (slightly bad), MB (moderately bad), and VB (very bad). On Form P the headings were: VS (very strong), MS (moderately strong), SS (slightly strong), SW (slightly weak), MW (moderately weak), and VW (very weak); and on Form A the headings were: VA (very active), MS (moderately active), SA (slightly active), SP (slightly passive), MP (moderately passive), and VP (very passive). For scoring purposes, each space represented a number from 1 to 6, with "1" representing the least positive or intense meaning and "6" representing the most positive or intense meaning.

Each form of the inventory was photocopied on four 21.6- by 27.9-cm sheets of paper. Every sheet contained one of the semantic differential scales discussed above. The first sheet of each form of the inventory contained directions for the rating procedure.

Generation of Trigram Lists

The apparatus used to compile the 12-item trigram lists employed in the learning trials of this experiment was an IBM Personal Computer and computer program written in Microsoft BASIC^{tm} (Appendix D). The rationale for the

construction of the program was twofold: (1) to insure that only consistently-rated items were used in the preparation of each subject's trigram list so that disparities in learning effects would not be due to unreliably-rated stimulus material, and (2) to insure that each trigram appeared an equal number of times in a high- and low-rated condition across subjects' lists so that differences in learning effects would not be due to variation in trigram pronunceability, familiarity, etc.

These program objectives were realized in the following manner. After the second administration of the Phonetic Impression Inventory, each subject's trigram ratings were entered into the computer. Those trigrams which a subject had rated identically on two occasions as either "high" (i.e., six or five) or "low" (i.e., two or one) on his/her particular meaning dimension were assembled into a pool of available items. Each trigram in the pool was then consecutively checked to determine if it appeared in the series of available items of another subject in the same or complimentary (i.e., same meaning dimension but opposite polarity) experimental group. If a match was found, the subjects' ratings of the trigrams were compared. If the first individual had rated the trigram "high," the second subject would have to have rated it as "low." For example, if a subject in the high potency group had rated a trigram by placing a checkmark in the two spaces nearest the "strong" end of the rating scale (high rating), then the second subject in either the high or low potency group would have to have rated it by placing a checkmark in the two spaces nearest the "weak" end of the rating scale (low rating). If no such condition existed, successive searches were made through the pools of available items of the remaining subjects until such a rating balance was obtained. If this objective could not realized, that particular item was discarded, and a second trigram was randomly chosen from the first individual's and submitted to the same procedure. This process was continued until a

list of 12 items was generated for each subject, 6 of which he had rated as "high" and 6 of which he had rated as "low." Furthermore, each of the 12 trigrams appearing on a subject's list also appeared on the lists of other subjects in the same or complimentary group, with the proviso that it appeared an equal number of times in a "high"- and "low"-rated condition. Although subjects were not acquiring identical lists of trigrams, each trigram was learned by at least two subjects in the same or complimentary group.

Procedure

Phase 1--Selection of Subjects

The Self Inventory Scale was administered to subjects in their classes. Before the inventories were passed out, a brief description of the experimental tasks, the approximate time needed to complete them, and the number of extra credit points subjects could expect to receive for participation in the study were given. It was also explained that, because of the special nature of the population needed, not all students who completed the Self Inventory Scale would be asked to continue with the experiment beyond the initial stage. The experimenter then asked for a show of hands of those students who wished to volunteer as subjects in the experiment, and the inventories were passed out to them. After the inventories were collected, it was announced that a list of those individuals deemed appropriate for continued participation in the study would be posted in the room by the next class meeting, along with the date, time, and place of the first trigram rating session.

The inventories were then scored, and those individuals having the most extreme scores in the upper or lower tertile of one of the three dimensions were assigned to one of the six experimental groups. A coin toss determined the group

membership of those subjects scoring in the highest or lowest ranges on more than one meaning dimension. Individuals with scores in the middle tertile on all three dimensions of the Self Inventory Scale were dropped from the study. This process was continued until all groups were filled.

Phase 2--Trigram Rating Task

All subjects participated in this phase of the experiment within 14 days after being given the Self Inventory Scale. Each subject took part in two rating sessions. The first session took place on two consecutive days. The second rating session occurred one week later on the same two consecutive days of the week as the first session. As they arrived at the experiment, subjects were ushered into a large classroom, seated, and told individually by the experimenter that they would be participating in a syllable-rating exercise. An appropriate form of the Phonetic Impression Inventory was then passed out to each subject. Subjects were instructed to read the directions on the forms and were encouraged to ask any questions they might have about the rating procedure. When a subject indicated his/her readiness to begin, he/she commenced the task. As each subject finished the syllable-rating task, an appointment was made for his/her second rating session.

After subjects completed two such administrations of the Phonetic Impression Inventory, their ratings were entered into the computer. Eighty-four lists of 12 trigrams each were then constructed, employing the algorithm described above, for use in the third phase of the experiment.

Phase 3--Free Recall Task

All subjects participated in this phase of the experiment within seven days after their second trigram-rating session. Upon their arrival at the experiment,

subjects were individually ushered into a small room equipped with a table and two chairs. They were told that they would be participating in a memory task and instructions (Appendix E) were read aloud to them by the experimenter. After the subject indicated his/her readiness to begin, the first learning trial was started. Each trigram on the subject's list of 12 was exposed for four seconds, with a one-second delay between presentations. Timing was measured by a standard stop watch. Trigrams were printed on 7.6- by 12.7-cm unruled, white index cards in block letter with a black Magic Marker^{tm}. The trigrams were thoroughly shuffled between presentations so as to minimize serial learning effects. Upon the completion of a list presentation, the subject was handed a 21.6- by 27.9-cm sheet of paper with 12 spaces printed on it (Appendix F) on which he/she recorded as many trigrams as he/she could recall having seen without concern for order. Inter-trial intervals were limited to 60 seconds. This procedure was continued until the subject was able to recall all 12 trigrams correctly on two consecutive learning trials. When the subject reached this criterion, he was thanked for his participation in the experiment and thoroughly debriefed.

Dependent Measures

The two dependent measures employed by Rychlak (1977) were used on the trigram recall task. The first dependent measure was the number of trials a subject took to reach two consecutive correct recalls for any one trigram. The total trials score for any subject's sublist of six "high"- and "low"-rated trigrams was obtained by adding the trials scores for every trigram contained in each sublist.

Because the trials score does not take into account all correct recalls made by a subject during an entire series of learning trials, a second dependent variable, devised by Rychlak (1977) and termed the "percent hits" score, was used in

this study. This measure was found by dividing the number of "hits" or correct recalls made by the subject of the trigrams contained in either of his/her two sublists by the total number of recall opportunities he/she had for either sublist in a series of learning trials. For example, if 12 trials had been necessary for a subject to achieve criterion (two consecutive correct recalls) for a list of 12 trigrams--6 rated "high" and 6 rated "low" on any of the three meaning dimensions--it could be said that he/she had 72 chances for "hits" in each of the sublists (6 trigrams X 12 trials). If the actual number of correct recalls for the "high" and "low" sublists is then divided by 72, the quotient is the percent-hits score. This ratio is usually correlated (.70 or greater) with the trials score (Rychlak, 1977).

Addendum to the Methodology

Because of subject attrition, and the fact that the computer program employed to generate trigram lists for the learning trials phase of this study did not function as planned due to the constraints within which it had to operate, two changes had to be made in the methodology. The first of these two changes was concerned with a reduction in the total number of subjects used in the study. The second change was concerned with a decrease in the number of trigrams which could be counterbalanced across subject lists.

Originally, the study included a pool of 42 male and 42 female subjects, 7 males and 7 females of whom were assigned to each of the six experimental groups. During the trigram-rating phase of the experiment, however, 9 individuals dropped out of the study, leaving some of the experimental groups with fewer than the original 14 subjects. Although other individuals were recruited in an effort to bring group membership back to the original level, not enough suitable subjects could be found to equalize cell size at 14. Rather than have

unequal cell size, and because all groups contained at least 12 individuals evenly divided by sex, it was decided to reduce the number of subjects in each experimental group from 14 to 12, thus decreasing the total subject population from 84 to 72.

The second change in the methodology, concerned with a reduction in the number of trigrams which were counterbalanced across subject lists, occurred as a result of the response set of subjects in the study. The selection process by which trigrams were chosen to appear on the 12-item lists used in the learning trials phase of the experiment was subject to several constraints. First, each individual's list of 12 trigrams was to consist of 6 which he/she had rated as "high" on his/her particular meaning dimension, and 6 of which he/she had rated "low." Second, only those trigrams which the subject had rated identically on two occasions could be used in the construction of his/her list, thus reducing the possibility that disparities in learning effects would be due to unreliably-rated stimulus material. Third, each of the 12 trigrams appearing on a subject's list would also have to appear on the lists of other subjects in the same or complimentary group, with the proviso that it appeared an equal number of times in a "high"- and "low"-rated condition. This counterbalancing procedure was employed so that differences in learning effects would not be due to variations in trigram pronunceability, familiarity, etc. The amount of flexibility the computer program had to carry through this matching procedure was directly dependent upon the number of reliably-rated items available in any one subject's pool of high- and low-rated trigrams. Therefore, as was the case in this study, if a subject rated a majority of trigrams inconsistently, or if he/she rated the majority of trigrams as either "low" or "high," his/her pool of suitable items would be necessarily diminished as would the computer's ability to match trigrams across subject lists. As a result of this constraint, the computer program was able to

match only 6 trigrams--3 in a high-rated condition and 3 in a low-rated condition --across subject lists rather than the originally intended 12 trigrams with 6 in each rating condition. Thus, each subject learned 6 trigrams which were counterbalanced across subject lists and 6 which were not. In order to control for this extraneous source of variability, a fourth variable--matched versus unmatched trigrams--was introduced into the study in addition to the three original variables, sex (male/female), subject self-rating (high/low), and trigram rating (high/low).

CHAPTER IV

RESULTS

The means and standard deviations for the trials to criterion and the percentage of correct recall scores for the evaluation, potency, and activity groups are presented in Tables I and II, IX and XI, and XIII and XIV, respectively. The data were analyzed separately for the two E, P, and A groups via two, four-way (2 X 2 X 2 X 2), split-plot analyses of variance (ANOVA). In this design, sex and bi-polar self rating constituted factors A and B (between subjects factors). Bi-polar trigram rating and trigram matchedness constituted factors C and D (within subjects factors). Due to the numerous analyses made, the results for the E groups will be presented first, followed by those of the P groups, and, last, those of the A groups.

Evaluation Results

The analysis of variance used to compare the trials to criterion scores for the low and high E groups is presented in Table III. As can be seen from this table, the analysis yielded a significant three-way interaction between self rating, trigram rating, and trigram matchedness, F (1,20) = 4.92, $p < .05$. There was also a tendency toward a main effect, F (1,20) = 3.39, $p < .10$, for factor A (sex) in favor of the females; that is, female subjects learned their trigrams uniformly faster than the male subjects.

TABLE I

MEANS AND STANDARD DEVIATIONS OF TRIALS TO CRITERION AS A FUNCTION OF SEX, BI-POLAR SELF AND CVC RATINGS, AND TRIGRAM MATCHEDNESS

Evaluation

Cell N = 6, Group N = 12

Sex	Self Ratings	Trigram Ratings: High, Matched M	Matched SD	Unmatched M	Unmatched SD	Low, Matched M	Matched SD	Unmatched M	Unmatched SD
Male	High	12.83	(5.49)	13.83	(5.42)	13.00	(1.41)	12.67	(5.05)
Male	Low	17.67	(11.55)	9.67	(1.86)	12.67	(6.50)	16.83	(10.83)
Female	High	10.83	(4.40)	11.00	(2.53)	10.50	(1.64)	11.33	(1.03)
Female	Low	9.83	(2.40)	7.50	(1.23)	11.00	(3.16)	11.61	(4.63)
Comb. Sexes	High	11.83	(4.86)	12.42	(4.30)	11.75	(1.96)	12.00	(3.54)
Comb. Sexes	Low	13.75	(8.95)	8.59	(1.88)	11.84	(4.95)	14.25	(8.39)

TABLE II

MEANS AND STANDARD DEVIATIONS OF PERCENTAGE OF CORRECT RECALLS AS A FUNCTION OF SEX, BI-POLAR SELF AND CVC RATINGS, AND TRIGRAM MATCHEDNESS

Evaluation

Cell N = 6, Group N = 12

Sex	Self Ratings	Trigram Ratings: High, Matched M	Matched SD	Unmatched M	Unmatched SD	Low, Matched M	Matched SD	Unmatched M	Unmatched SD
Male	High	78.60	(11.03)	73.91	(14.53)	74.26	(8.63)	77.28	(10.67)
Male	Low	69.71	(14.75)	82.76	(8.15)	77.12	(12.28)	68.35	(16.84)
Female	High	79.55	(10.74)	80.82	(6.89)	82.36	(3.49)	77.06	(8.32)
Female	Low	80.23	(9.91)	91.63	(7.39)	77.23	(11.11)	75.13	(14.50)
Comb. Sexes	High	79.03	(10.39)	77.37	(11.43)	78.31	(7.57)	77.17	(9.12)
Comb. Sexes	Low	74.97	(13.18)	87.20	(8.74)	77.18	(11.16)	71.74	(15.40)

TABLE III

ANALYSIS OF VARIANCE OF THE EFFECTS OF SEX, BI-POLAR SELF AND CVC RATINGS, AND TRIGRAM MATCHEDNESS ON TRIALS TO CRITERION (2 X 2 X 2 X 2) E GROUPS

Source of Variation	SS	df	MS	F
Between Subjects				
A (Sex)	243.84	1	243.84	3.39+
B (Self Ratings)	0.26	1	0.26	0.00
AB	25.01	1	25.01	0.35
Subjects w. Group Error	1436.87	20	71.84	
Within Subjects				
C (Trigram Ratings)	15.84	1	15.84	1.93
AC	6.51	1	6.51	0.79
BC	27.09	1	27.09	3.30+
ABC	1.76	1	1.76	0.21
C x Subjects w. Group Error	164.04	20	8.20	
D (Trigram Matchedness)	5.51	1	5.51	0.40
AD	2.34	1	2.34	0.17
BD	19.26	1	19.26	1.40
ABD	1.26	1	1.26	0.09
D x Subjects w. Group Error	275.87	20	13.79	
CD	78.84	1	78.84	4.12+
ACD	19.26	1	19.26	1.01
BCD	94.01	1	94.01	4.92*
ABCD	46.76	1	46.76	2.45
CD x Subjects w. Group Error	382.37	20	19.12	

*$p < .05$.

+$p < .10$.

In order to ascertain more clearly the nature of the three-way interaction, a two-way (2 X 2) split-plot analysis of variance for factors B (self rating) and C (trigram rating) was performed at each level of factor D (trigram matchedness). These analyses are presented in Tables IV and V. The analysis of variance for the matched trigrams yielded no significant main or interaction effects. The analysis of variance for unmatched trigrams produced a significant interaction between bi-polar self rating and bi-polar trigram rating, F (1,22) = p < .05. A graphic display of this interaction is presented in Figure 1. Contrary to the predictions based on Rychlak's theory, when combined over sex, high self evaluators learned their high- and low-rated unmatched trigrams at about the same rate, with a slight edge in favor of the low-rated items. Low self evaluators learned their high-rated unmatched trigrams more quickly than their low-rated unmatched items.

To summarize the results of the analyses made of the trials to criterion scores for the low and high E groups, the tendency of the female subjects to learn their trigrams faster than their male counterparts approached significance. High self evaluators in both matched and unmatched conditions tended to exhibit little variation in their scores for high- and low-rated trigrams. It is the low evaluators who appear to have been most influenced by the matchedness variable, finding their high-rated, unmatched trigrams much easier to learn than their low-rated, unmatched trigrams. Overall, the data failed to support the hypothesized effect. In fact, results tended to exhibit a flattening of the expected effect or marked reversals.

The analysis of variance used to compare the percentage of correct recall scores for the low and high E groups (Table VI) produced results similar to those yielded by the analysis of the trials to criterion scores--namely, a significant three-way interaction between self-rating, trigram rating, and trigram matched-

TABLE IV

ANALYSIS OF VARIANCE OF SIMPLE INTERACTION EFFECTS
OF BI-POLAR SELF AND CVC RATINGS ON TRIALS
TO CRITERION MATCHED TRIGRAMS
(2 X 2) E GROUPS

Source of Variation	SS	df	MS	F
Between Subjects				
B (Self Ratings)	12.00	1	12.00	0.22
Between Subjects Error	1202.92	22	54.68	
Within Subjects				
C (Trigram Ratings)	12.00	1	12.00	1.06
BC	10.09	1	10.09	0.89
Within Subjects Error	248.91	22	11.31	

TABLE V

ANALYSIS OF VARIANCE OF SIMPLE INTERACTION EFFECTS OF BI-POLAR SELF AND CVC RATINGS ON TRIALS TO CRITERION UNMATCHED TRIGRAMS (2 X 2) E GROUPS

Source of Variation	SS	df	MS	F
Between Subjects				
B (Self Ratings)	7.52	1	7.52	0.21
Between Subjects Error	782.29	22	35.56	
Within Subjects				
C (Trigram Ratings)	82.69	1	82.69	4.89*
BC	111.03	1	111.03	6.57*
Within Subjects Error	371.79	22	16.90	

*$p < .05$.

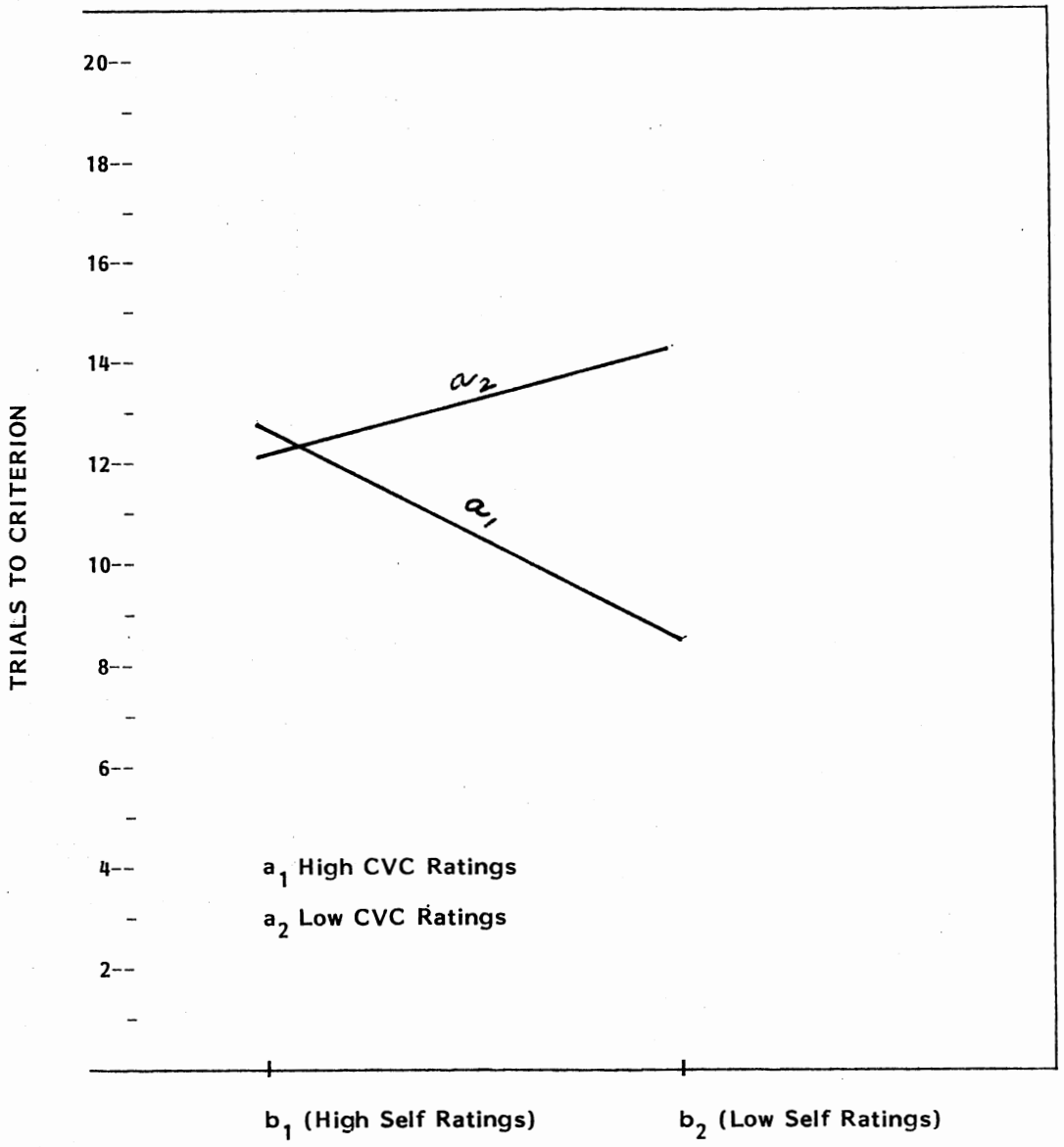

Figure 1. Mean Trials to Criterion for High and Low E Groups on Low- and High-Rated Unmatched Trigrams

TABLE VI

ANALYSIS OF VARIANCE OF THE EFFECTS OF SEX, BI-POLAR SELF AND CVC RATINGS, AND TRIGRAM MATCHEDNESS ON PERCENTAGE OF CORRECT RECALLS (2 X 2 X 2 X 2) E GROUPS

Source of Variation	SS	df	MS	F
Between Subjects				
A (Sex)	661.71	1	661.71	3.28+
B (Self Ratings)	1.06	1	1.06	0.01
AB	41.58	1	41.58	0.21
Subjects w. Group Error	4037.41	20	201.87	
Within Subjects				
C (Trigram Ratings)	302.89	1	302.89	3.03+
AC	58.37	1	58.37	0.58
BC	226.51	1	226.51	2.26
ABC	58.91	1	58.91	0.59
C x Subjects w. Group Error	2001.30	20	100.06	
D (Trigram Matchedness)	23.17	1	23.17	0.22
AD	2.65	1	2.65	0.03
BD	139.64	1	139.64	1.35
ABD	20.42	1	20.42	0.20
D x Subjects w. Group Error	2064.38	20	103.22	
CD	438.36	1	438.36	5.01*
ACD	13.32	1	13.32	0.15
BCD	498.32	1	498.32	5.70*
ABCD	191.25	1	191.25	2.19
CD x Subjects w. Group Error	1748.27	20	87.41	

*$p < .05$.

+$p < .10$.

ness, F (1,20) = 5.70, $p < .05$. This analysis also produced a significant two-way interaction between trigram rating and trigram matchedness, F (1,20) = 5.01, $p < .05$, and a tendency toward a main effect, F (1,20) = 3.28, $p < .10$, for factor A (sex), once again in favor of the females; that is, the female subjects learned their trigrams better than the male subjects.

The significant three-way interaction was, again, investigated via a two-way (2 X 2) split-plot analysis of variance for factors B (self rating) and C (trigram rating) at each level of factor D (trigram matchedness). The analysis of variance for matched trigrams (Table VII) again yielded no significant main or interaction effects. The analysis of variance for unmatched trigrams (Table VIII), however, again produced a significant interaction between bi-polar self rating and bi-polar trigram rating, F (1,22) = 7.92, $p < .05$. A graphic display of this interaction is presented in Figure 2. Once again, when combined over sex, the high self evaluators learned their high- and low-rated unmatched trigrams at an almost identical rate of error. Also, low self evaluators once more learned their high-rated unmatched trigrams much better than their low-rated unmatched items.

The results for the various analyses made of the percentage of correct recall scores for the low and high E groups are very similar to the findings produced by the trials to criterion scores. To summarize, the tendency of the female subjects to outperform their male counterparts approached significance, but factor A (sex) did not enter into any interactions with any of the other factors. High self evaluators in both the matched and unmatched conditions tended to learn their high- and low-rated trigrams at about the same rate of error. Once again, it was the low self evaluators who appear to have been most influenced by the matchedness variable, learning their high-rated unmatched tri-

TABLE VII

ANALYSIS OF VARIANCE OF SIMPLE INTERACTION EFFECTS OF BI-POLAR SELF AND CVC RATINGS ON PERCENTAGE OF CORRECT RECALLS MATCHED TRIGRAMS (2 X 2) E GROUPS

Source of Variation	SS	df	MS	F
Between Subjects				
B (Self Ratings)	82.50	1	82.50	0.56
Between Subjects Error	3250.20	22	147.74	
Within Subjects				
C (Trigram Ratings)	6.24	1	6.24	0.08
BC	26.45	1	26.45	0.33
Within Subjects Error	1775.55	22	80.71	

TABLE VIII

ANALYSIS OF VARIANCE OF SIMPLE INTERACTION EFFECTS OF BI-POLAR SELF AND CVC RATINGS ON PERCENTAGE OF CORRECT RECALLS UNMATCHED TRIGRAMS (2 X 2) E GROUPS

Source of Variation	SS	df	MS	F
Between Subjects				
B (Self Ratings)	58.19	1	58.19	0.33
Between Subjects Error	3859.65	22	175.44	
Within Subjects				
C (Trigram Ratings)	735.00	1	735.00	8.33*
BC	698.37	1	698.37	7.92*
Within Subjects Error	1940.84	22	88.22	

*$p < .05$.

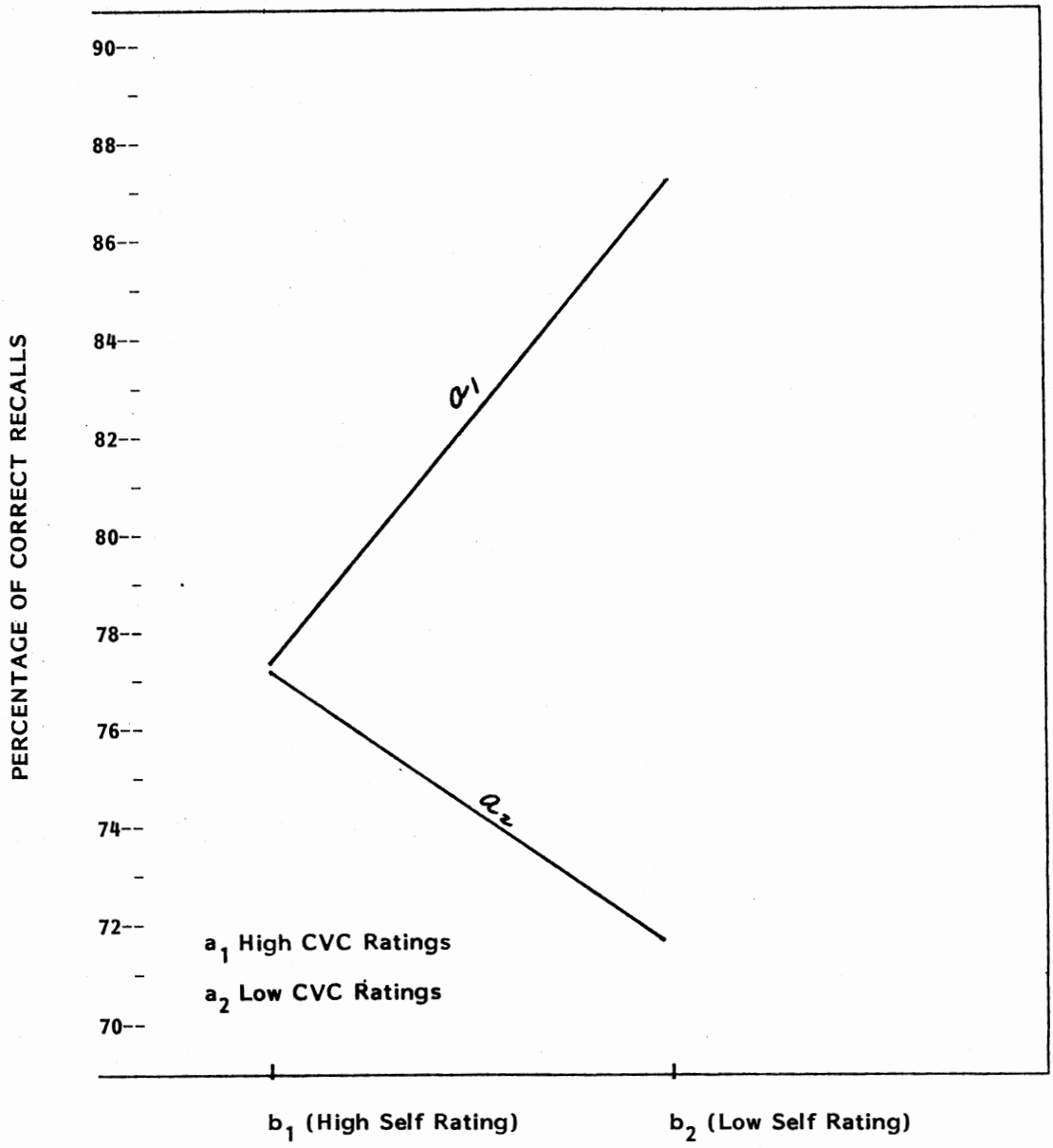

Figure 2. Mean Percentage of Correct Recalls for High and Low E Groups on Low- and High-Rated Unmatched Trigrams

grams much better than their low-rated, unmatched items. Once again, the data failed to produce significant support for the hypothesized effect.

Potency Results

The means and standard deviations for the trials to criterion scores for the P groups are presented in Table IX. The analysis of variance used to compare the trials to criterion scores for the low and high P groups (Table X) yielded a significant interaction between factors A (sex) and D (trigram matchedness), F (1,20) = 6.38, $p < .05$. A graphic depiction of this interaction is presented in Figure 3. As can be seen in this figure, there was slightly more than a one-trial difference between the male/female scores on matched items, but more than a four-trial difference between their scores on unmatched items, with the females outperforming the males. This latter difference was significant at the .05 level in a Newman-Keuls' multiple-range test.

Although no other significant findings emerged from this analysis, a tendency toward a main effect for factor B (self rating) approached significance, F (1,20) = 3.10, $p < .10$, in favor of the low potency group. That is, the low potency subjects tended to acquire their trigrams more quickly than the high potency subjects, regardless of sex, trigram rating, or trigram matchedness. A three-way interaction between sex, self rating, and trigram rating also approached significance, F (1,20) = 3.30, $p < .10$.

The means and standard deviations for the percentage of correct recall scores for the P groups are presented in Table XI. The analysis of variance used to compare the two P groups' percentage of correct recall scores (Table XII) also yielded a significant two-way interaction between factors A (sex) and D (trigram matchedness), F (1,20) = 6.80, $p < .05$. This interaction is illustrated in Figure 4. As can be seen in this figure, female subjects again learned their unmatched tri-

TABLE IX

MEANS AND STANDARD DEVIATIONS OF TRIALS TO CRITERION AS A FUNCTION OF SEX, BI-POLAR SELF AND CVC RATINGS, AND TRIGRAM MATCHEDNESS

Potency

Cell N = 6, Group N = 12

Sex	Self Ratings	Trigram Ratings: High, Matched M	High, Matched SD	High, Unmatched M	High, Unmatched SD	Low, Matched M	Low, Matched SD	Low, Unmatched M	Low, Unmatched SD
Male	High	14.50	(7.06)	16.33	(13.32)	17.17	(9.50)	18.83	(9.09)
Male	Low	11.67	(5.47)	13.33	(9.05)	10.83	(3.87)	9.83	(1.72)
Female	High	13.83	(3.55)	12.17	(5.53)	12.83	(4.58)	11.17	(3.66)
Female	Low	10.17	(2.40)	9.67	(2.73)	12.83	(4.36)	8.33	(1.86)
Comb. Sexes	High	14.17	(5.33)	14.25	(9.96)	15.00	(7.46)	15.00	(7.72)
Comb. Sexes	Low	10.92	(4.10)	11.50	(6.65)	11.83	(4.06)	9.08	(1.88)

TABLE X

ANALYSIS OF VARIANCE OF THE EFFECTS OF SEX, BI-POLAR SELF AND CVC RATINGS, AND TRIGRAM MATCHEDNESS ON TRIALS TO CRITERION (2 X 2 X 2 X 2) P GROUPS

Source of Variation	SS	df	MS	F
Between Subjects				
A (Sex)	173.34	1	173.34	1.58
B (Self Ratings)	341.26	1	341.26	3.10+
AB	55.51	1	55.51	0.50
Subjects w. Group Error	2200.04	20	110.00	
Within Subjects				
C (Trigram Ratings)	0.01	1	0.01	0.00
AC	0.84	1	0.84	0.05
BC	14.26	1	14.26	0.76
ABC	61.76	1	61.76	3.30+
C x Subjects w. Group Error	373.87	20	18.69	
D (Trigram Matchedness)	6.51	1	6.51	0.71
AD	58.59	1	58.59	6.38*
BD	7.59	1	7.59	0.83
ABD	0.51	1	0.51	0.06
D x Subjects w. Group Error	183.54	20	9.18	
CD	17.51	1	17.51	0.77
ACD	0.51	1	0.51	0.02
BCD	15.84	1	15.84	0.69
ABCD	0.84	1	0.84	0.04
CD x Subjects w. Group Error	457.04	20	22.85	

*$p < .05$.

+$p < .10$.

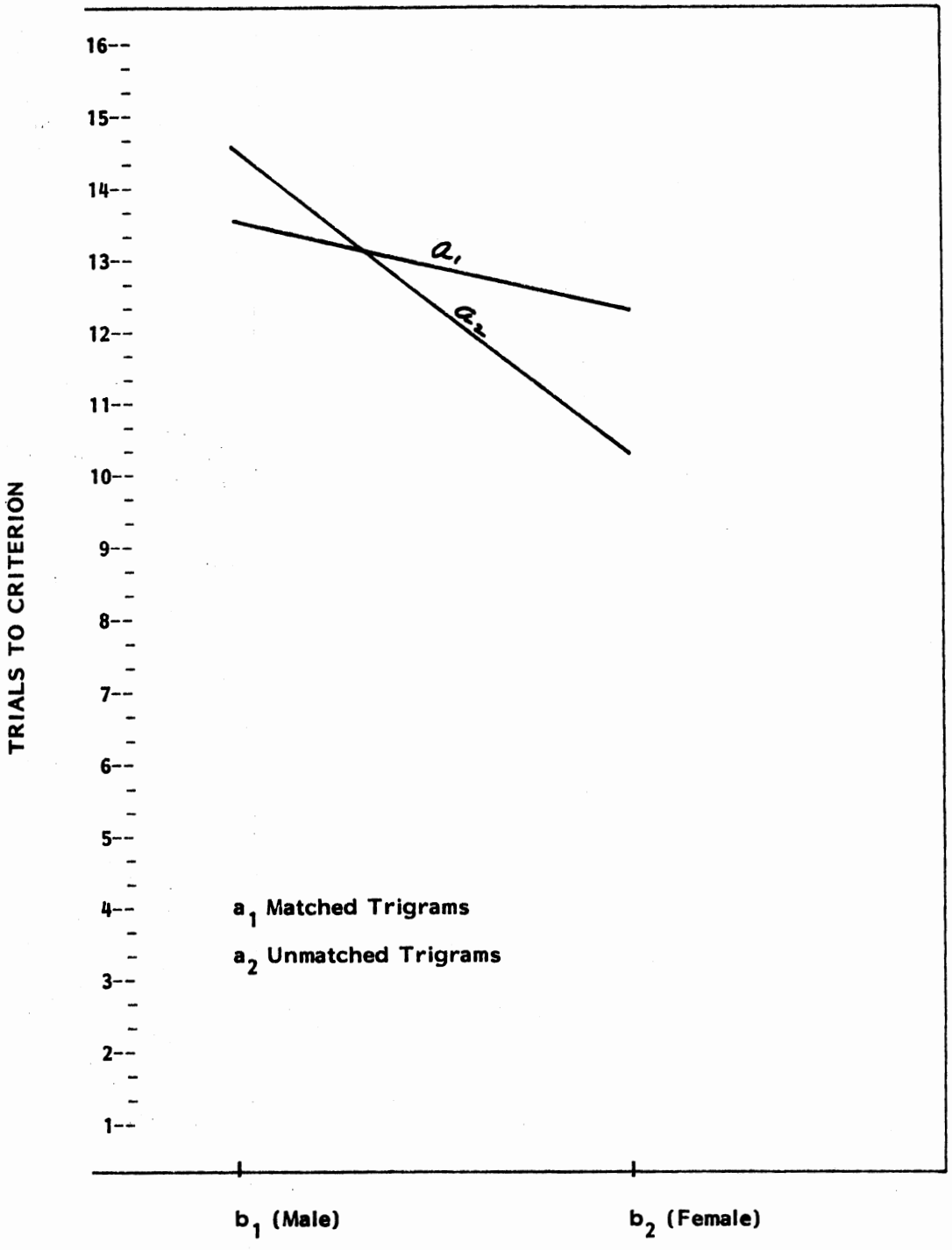

Figure 3. Mean Trials to Criterion for Males and Females on Matched and Unmatched Trigrams--P Groups

TABLE XI

MEANS AND STANDARD DEVIATIONS OF PERCENTAGE OF CORRECT RECALLS AS A FUNCTION OF SEX, BI-POLAR SELF AND CVC RATINGS, AND TRIGRAM MATCHEDNESS

Potency

Cell N = 6, Group N = 12

Sex	Self Ratings	Trigram Ratings: High — Matched M	Matched SD	Unmatched M	Unmatched SD	Low — Matched M	Matched SD	Unmatched M	Unmatched SD
Male	High	77.24	(13.25)	73.92	(32.55)	68.17	(13.46)	65.60	(8.71)
Male	Low	84.12	(10.40)	76.56	(13.32)	77.82	(12.66)	81.58	(7.85)
Female	High	76.85	(7.72)	76.85	(9.90)	78.15	(11.85)	86.09	(9.17)
Female	Low	76.30	(9.52)	84.49	(11.31)	74.50	(16.30)	82.73	(6.09)
Comb. Sexes	High	77.05	(9.85)	75.39	(22.99)	73.16	(13.16)	75.85	(13.68)
Comb. Sexes	Low	80.21	(10.35)	80.53	(12.48)	76.16	(14.01)	82.76	(6.73)

TABLE XII

ANALYSIS OF VARIANCE OF THE EFFECTS OF SEX, BI-POLAR SELF AND CVC RATINGS, AND TRIGRAM MATCHEDNESS ON PERCENTAGE OF CORRECT RECALLS (2 X 2 X 2 X 2) P GROUPS

Source of Variation	SS	df	MS	F
Between Subjects				
A (Sex)	358.63	1	358.63	0.93
B (Self Ratings)	464.77	1	464.77	1.20
AB	461.08	1	461.08	1.19
Subjects w. Group Error	7720.26	20	386.00	
Within Subjects				
C (Trigram Ratings)	51.32	1	51.32	0.51
AC	246.62	1	246.62	2.43
BC	1.52	1	1.52	0.01
ABC	342.58	1	342.58	3.38+
C x Subjects w. Group Error	2027.75	20	101.39	
D (Trigram Matchedness)	80.65	1	80.65	1.26
AD	435.07	1	435.07	6.80*
BD	41.88	1	41.88	0.65
ABD	15.34	1	15.34	0.24
D x Subjects w. Group Error	1279.89	20	63.99	
CD	150.68	1	150.68	0.86
ACD	6.22	1	6.22	0.04
BCD	2.64	1	2.64	0.02
ABCD	128.09	1	128.09	0.74
CD x Subjects w. Group Error	3485.26	20	174.26	

*$p < .05$.

+$p < .10$.

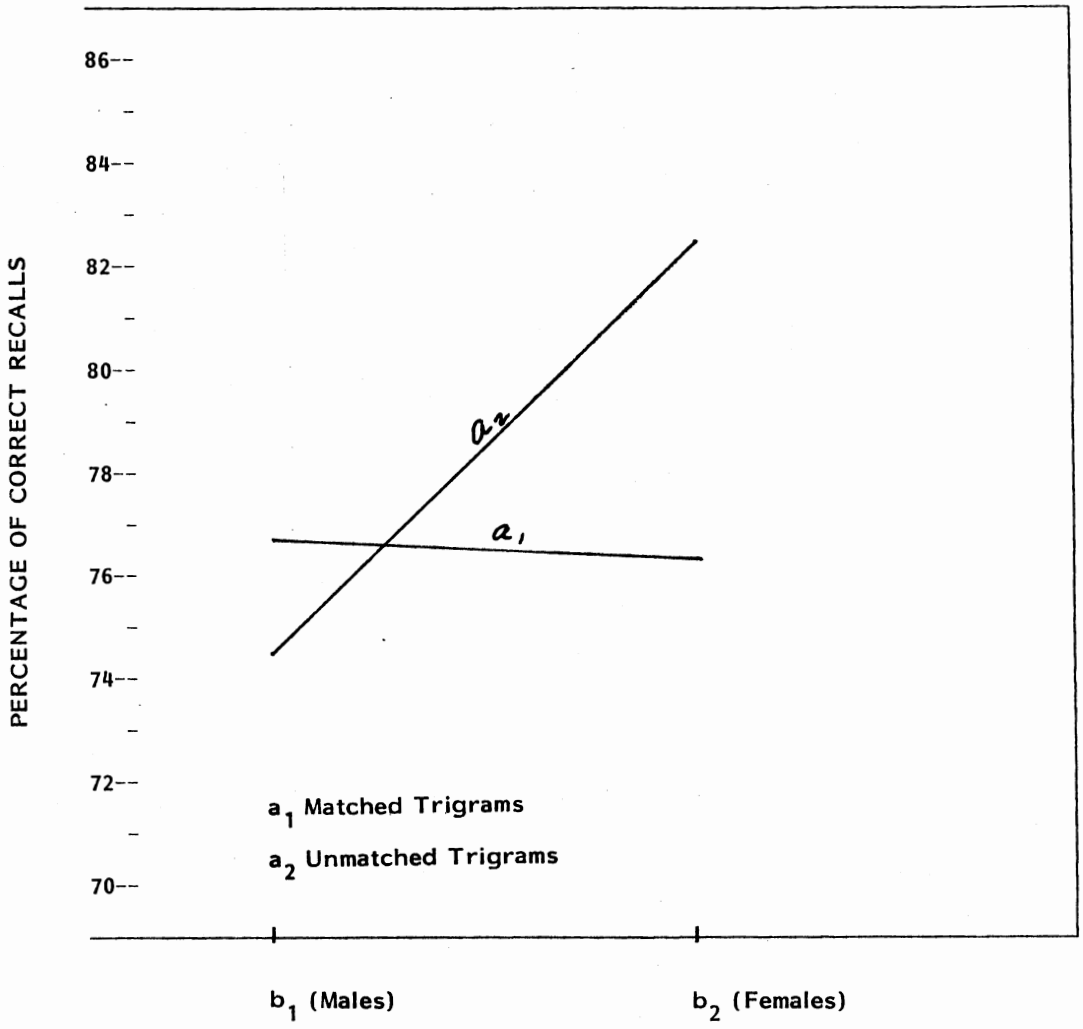

Figure 4. Mean Percentage of Correct Recalls for Males and Females on Matched and Unmatched Trigrams--P Groups

grams better than the male subjects learned their unmatched trigrams. Also, female subjects learned their unmatched items better than they learned their matched items. Both of these differences were significant at the .05 level in a Newman-Keuls' multiple-range test.

Although no other significant findings emerged from the analysis, as was the case with the P groups' trial to criterion scores, a three-way interaction between sex, self rating, and trigram rating also approached significance, F (1,20) = 3.38, $p < .10$.

Activity Results

The means and standard deviations for the A groups' trial to criterion and percentage of correct recall scores are presented in Tables XIII and XIV, respectively. The analysis of the A groups' trials to criterion scores (Table XV) yielded a significant main effect for factor D (trigram matchedness), F (1,20) = 8.69, $p < .01$, in favor of unmatched trigrams; that is, unmatched trigrams were learned faster than matched trigrams. The interaction between factors A (sex) and D (trigram matchedness) approached significance, F (1,20) = 4.05, $p < .10$.

The analysis of the A groups' percentage of correct recall scores is presented in Table XVI. As can be seen from this table, no significant main or interaction effects emerged from these data.

TABLE XIII

MEANS AND STANDARD DEVIATIONS OF TRIALS TO CRITERION AS A FUNCTION OF SEX, BI-POLAR SELF AND CVC RATINGS, AND TRIGRAM MATCHEDNESS

Activity

Cell N = 6, Group N = 12

Sex	Self Ratings	Trigram Ratings: High, Matched M	Matched SD	Unmatched M	Unmatched SD	Low, Matched M	Matched SD	Unmatched M	Unmatched SD
Male	High	13.50	(3.99)	9.67	(3.39)	12.33	(4.08)	9.83	(2.32)
Male	Low	15.33	(4.59)	11.33	(2.58)	14.67	(5.16)	10.83	(3.06)
Female	High	11.00	(2.97)	10.83	(2.79)	11.83	(5.78)	12.83	(5.42)
Female	Low	14.83	(11.53)	14.17	(11.48)	14.33	(5.01)	11.50	(5.58)
Comb. Sexes	High	12.25	(3.60)	10.25	(3.02)	12.08	(4.78)	11.33	(4.27)
Comb. Sexes	Low	15.08	(8.37)	12.75	(8.07)	14.50	(4.85)	11.17	(4.30)

TABLE XIV

MEANS AND STANDARD DEVIATIONS OF PERCENTAGE OF CORRECT RECALLS AS A FUNCTION OF SEX, BI-POLAR SELF AND CVC RATINGS, AND TRIGRAM MATCHEDNESS

Activity

Cell N = 6, Group N = 12

Sex	Self Ratings	Trigram Ratings: High — Matched M	Matched SD	Unmatched M	Unmatched SD	Low — Matched M	Matched SD	Unmatched M	Unmatched SD
Male	High	76.89	(10.83)	79.94	(10.43)	77.87	(12.84)	80.83	(10.22)
Male	Low	68.34	(16.57)	78.68	(7.69)	73.21	(13.65)	79.11	(6.88)
Female	High	79.81	(7.47)	81.10	(9.98)	76.24	(12.07)	77.14	(13.32)
Female	Low	75.88	(19.19)	76.71	(16.00)	77.69	(9.54)	81.85	(12.94)
Comb. Sexes	High	78.35	(8.99)	80.52	(9.75)	77.06	(11.91)	78.84	(11.48)
Comb. Sexes	Low	72.11	(17.54)	77.70	(12.02)	75.45	(11.47)	80.48	(9.98)

TABLE XV

ANALYSIS OF VARIANCE OF THE EFFECTS OF SEX, BI-POLAR SELF AND CVC RATINGS, AND TRIGRAM MATCHEDNESS ON TRIALS TO CRITERION (2 X 2 X 2 X 2) A GROUPS

Source of Variation	SS	df	MS	F
Between Subjects				
A (Sex)	5.51	1	5.51	0.07
B (Self Ratings)	86.26	1	86.26	1.03
AB	0.84	1	0.84	0.01
Subjects w. Group Error	1674.12	20	83.71	
Within Subjects				
C (Trigram Ratings)	2.34	1	2.34	0.11
AC	1.26	1	1.26	0.06
BC	14.26	1	14.26	0.68
ABC	12.76	1	12.76	0.61
C x Subjects w. Group Error	417.62	20	20.88	
D (Trigram Matchedness)	106.26	1	106.26	8.69*
AD	49.59	1	49.59	4.05+
BD	12.76	1	12.76	1.04
ABD	3.01	1	3.01	0.25
D x Subjects w. Group Error	244.62	20	12.23	
CD	0.09	1	0.09	0.01
ACD	2.34	1	2.34	0.20
BCD	7.59	1	7.59	0.66
ABCD	1.76	1	1.76	0.15
CD x Subjects w. Group Error	230.46	20	11.52	

*$p < .01$.

+$p < .10$.

TABLE XVI

ANALYSIS OF VARIANCE OF THE EFFECTS OF SEX, BI-POLAR SELF AND CVC RATINGS, AND TRIGRAM MATCHEDNESS ON PERCENTAGE OF CORRECT RECALLS (2 X 2 X 2 X 2) A GROUPS

Source of Variation	SS	df	MS	F
Between Subjects				
A (Sex)	49.85	1	49.85	0.22
B (Self Ratings)	126.13	1	126.13	0.55
AB	73.81	1	73.81	0.32
Subjects w. Group Error	4613.15	20	230.66	
Within Subjects				
C (Trigram Ratings)	16.22	1	16.22	0.12
AC	22.58	1	22.58	0.16
BC	120.38	1	120.38	0.87
ABC	45.76	1	45.76	0.33
C x Subjects w. Group Error	2766.58	20	138.33	
D (Trigram Matchedness)	324.94	1	324.94	2.78
AD	84.90	1	84.90	0.73
BD	63.79	1	63.79	0.55
ABD	20.68	1	20.68	0.18
D x Subjects w. Group Error	2341.10	20	117.05	
CD	0.96	1	0.96	0.01
ACD	20.89	1	20.89	0.17
BCD	0.14	1	0.14	0.00
ABCD	24.50	1	24.50	0.20
CD x Subjects w. Group Error	2400.61	20	120.03	

CHAPTER V

DISCUSSION

The hypothesis that trigrams judged to be congruent with a subject's self-assessment in terms of one of Osgood's three dimensions of meaning would be easier to recall than those judged to be incongruent failed to receive empirical support in this study. Such results are inconsistent with the findings of other experiments conducted by Rychlak and his associates. For instance, the results of many such studies have indicated that high self evaluators consistently acquire their positively-rated material significantly more quickly than their negatively-rated material (Rychlak, 1966; McFarland, 1969; Galster, 1971; Andrews, 1972; Rychlak, Flynn, & Burger, 1979), and that low self evaluators learn their congruently-rated trigrams significantly faster than their incongruently-rated trigrams (Rychlak, Carlsen, & Dunning, 1974). The fact that the P and A groups also failed to acquire their congruently-rated material faster than their incongruently-rated material is also at odds with findings obtained by Rychlak and his associates. For example, in two studies in which Rychlak used pretests which classified subjects along personality dimensions similar to the P and A dimensions, he found evidence to suggest that some subjects, primarily males, learned their congruently-rated trigrams better than their incongruently-rated trigrams (Rychlak, Tasto, Andrews, & Ellis, 1973; Rychlak, Carlsen, & Dunning, 1974).

It is the contention of this author that the major reason for the discrepancy between the results of this study and the other studies mentioned above is that the plan and implementation of this experiment involved efforts to control for the difficulty of the stimulus material; that is, to minimize the influence that variability in trigram familiarity or pronunciation might have upon learning styles, by using a computer-assisted procedure to counterbalance trigrams across subject lists. The results of this study suggest that when this control is added, little differential learning takes place. This is a feature which Rychlak has, apparently, never incorporated into his studies and, because he has not, the validity of his interpretation of his results may be questionable. That is, the findings obtained by Rychlak, which were discussed above, may have been due more to differences in trigram familiarity or pronunceability than to a congruency effect. Had Rychlak controlled for the former, he may well have obtained different results.

The only major differential learning effect which appeared to take place in this study was the tendency of some subjects, particularly the female subjects, to learn trigrams which were not matched for difficulty better than those which were. This effect appeared rather consistently throughout the E, P, and A groups. This finding raises some interesting speculations regarding the manner in which learning styles may be influenced. Several possibilities will be discussed below.

One possible reason for the tendency of some subjects to learn their unmatched trigrams more quickly than their matched trigrams may have to do with gender differences in learning styles. As may be remembered, the data for the P groups indicated that the female subjects not only learned their unmatched items faster and better than their matched items, but also learned them faster and better than the males learned their unmatched items. Such a difference may be

due to the possibility that, in our society, females are socialized to be more in touch with, and expressive of, their feelings than are males, with the result that they might do better in learning situations in which the chances of obtaining more highly cathected stimuli were greater. That is, while the matching process insures that the trigrams which are learned are rated equally in opposite directions, it also ignores those items which are not so balanced in terms of subject ratings. This means that trigrams which would ordinarily draw a response polarized at one end of the rating scale or the other would not be contained in the matched lists. Therefore, unmatched trigrams may have a less neutral and more highly charged emotional valence than matched trigrams and, hence, be more memorable to the female subjects.

A second possible reason for the tendency of subjects to learn their unmatched items more quickly than their matched items may be due to stimulus complexity or lack thereof. As may be recalled, the data for the A groups revealed a significant main effect for trigram matchedness in favor of unmatched trigrams. The fact that unmatched trigrams were easier to learn again suggests the possibility that trigrams which tend to elicit polar-opposite reactions from subjects, and would thus be more likely to appear in the matched condition, may simply be more complex and harder to learn than trigrams which do not.

Stimulus complexity in combination with other factors may have also been influential in the learning styles of the E groups. For instance, the data for the E groups revealed that the performance of the high self evaluators appeared to be little influenced by the matchedness factor. Low self evaluators, however, demonstrated a decided tendency to learn their unmatched trigrams better than their matched trigrams but only when they were high-rated. In this case, it would appear that stimulus complexity or lack thereof may have been more

dependent upon ease or difficulty of pronunciation or relative familiarity of the stimulus material. That is, for the low self evaluators, high-rated--that is, "good"--trigrams were simply more familiar or easier to pronounce than "bad" trigrams.

The fact that the low self evaluators tended to learn their incongruently-rated material far better than their congruently-rated material in a learning situation analogous to the learning conditions employed in Rychlak's studies, that is, one in which differences in the difficulty of the stimuli were not controlled for, is, of course, in direct opposition to the congruency effect Rychlak would have predicted. This result also raises some interesting speculations regarding personality differences between the high and low self evaluators and the possible influence of these personality differences upon learning styles which provide an alternative view to the one proposed by Rychlak. For instance, Rychlak hypothesized (Rychlak, Carlsen, & Dunning, 1974) that individuals with positive self images would attend to and acquire the positively-rated aspects of their experience at the expense of the negatively-rated aspects. Individuals with negative self images, on the other hand, would notice and acquire the negatively-rated aspects of their experience at the expense of its positively-rated characteristics, which would result in a self-perpetuating downward spiral of increasing maladjustment characterized by an increasingly negative self image and world view. It would seem, on the basis of this view, that Rychlak did not take into account the role of compensatory defenses in human dynamics. For example, individuals with high self esteem may have less of a need to structure a task along "easier" or "harder to learn" lines. Their sense of self worth is not necessarily dependent upon how well they perform on a verbal learning exercise. People with poor self images, on the other hand, may exhibit a defensive, a compensatory, learning style. Their sense of self worth may be much more dependent upon how well

they perform and, therefore, they may structure a learning task along lines which will increase their chances of a better performance.

In conclusion, it would appear that two points of major importance have emerged from this study. The first is that trigrams which are not matched across subject lists and which are not, therefore, subject to control for variability in features such as pronunceability or familiarity, appear to be, perhaps for a number of reasons, easier to learn than those which are so matched. The second, and perhaps more important, point is that one of the major features differentiating this study from those conducted by Rychlak and his associates is that attempts were made, in this experiment, to control for variability in the stimulus material so as to minimize its influence on learning styles, a procedure which has not been incorporated into Rychlak's work. That this study, so designed, failed to confirm Rychlak's findings calls into question the validity of Rychlak's interpretation of his results.

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APPENDIX A

PHONETIC PREFERENCE INVENTORY

Phonetic Preference Inventory

Name:_____ Age:_____ Sex:_____ Grade:_____

Address:_____ Phone No.:_____

Marital Status:_____ Instructor:_____ Class Hour:_____

This is a test of letter-combination preference. It consists of 140 syllable-like "trigrams" composed of differing letter combinations. You are to look at each one of the trigrams and than place an "X" to indicate whether you like or dislike the trigram. Read it "aloud" to yourself and then decide on the basis of how you "feel" about it.

There are no right or wrong answers in the usual sense, because all answers are equally good. While there is no time limit on this test, you should not linger over any of the trigrams nor try to analyze why you like or dislike them. Just look at each trigram and place an "X" in the appropriate space below to indicate whether you:

(LM) like the trigram much
(LS) like the trigram slightly
(DS) dislike the trigram slightly
(DM) dislike the trigram much

Remember, no matter how slight your feeling may be, every trigram must be marked to indicate whether you like or dislike it.

Syllable	(LM)	(LS)	(DS)	(DM)	Syllable	(LM)	(LS)	(DS)	(DM)
1. JOR	( )	( )	( )	( )	13. BEH	( )	( )	( )	( )
2. RAJ	( )	( )	( )	( )	14. DEH	( )	( )	( )	( )
3. WYR	( )	( )	( )	( )	15. DYX	( )	( )	( )	( )
4. YIR	( )	( )	( )	( )	16. GOZ	( )	( )	( )	( )
5. YOC	( )	( )	( )	( )	17. JOX	( )	( )	( )	( )
6. RYF	( )	( )	( )	( )	18. MOY	( )	( )	( )	( )
7. RYK	( )	( )	( )	( )	19. PEM	( )	( )	( )	( )
8. SEQ	( )	( )	( )	( )	20. QIC	( )	( )	( )	( )
9. NUJ	( )	( )	( )	( )	21. WOB	( )	( )	( )	( )
10. PIV	( )	( )	( )	( )	22. WYM	( )	( )	( )	( )
11. FAP	( )	( )	( )	( )	23. YUH	( )	( )	( )	( )
12. HIB	( )	( )	( )	( )	24. CYK	( )	( )	( )	( )

Syllable	(LM)	(LS)	(DS)	(DM)	Syllable	(LM)	(LS)	(DS)	(DM)
25. DYS	( )	( )	( )	( )	49. FAZ	( )	( )	( )	( )
26. HUZ	( )	( )	( )	( )	50. HOZ	( )	( )	( )	( )
27. KEV	( )	( )	( )	( )	51. JUM	( )	( )	( )	( )
28. LIG	( )	( )	( )	( )	52. MUV	( )	( )	( )	( )
29. LIX	( )	( )	( )	( )	53. NAS	( )	( )	( )	( )
30. NEP	( )	( )	( )	( )	54. PIQ	( )	( )	( )	( )
31. TYD	( )	( )	( )	( )	55. SYK	( )	( )	( )	( )
32. VOX	( )	( )	( )	( )	56. WYT	( )	( )	( )	( )
33. YAT	( )	( )	( )	( )	57. ZEL	( )	( )	( )	( )
34. BYK	( )	( )	( )	( )	58. HYT	( )	( )	( )	( )
35. GUC	( )	( )	( )	( )	59. JOD	( )	( )	( )	( )
36. RYN	( )	( )	( )	( )	60. TUS	( )	( )	( )	( )
37. SOV	( )	( )	( )	( )	61. WUD	( )	( )	( )	( )
38. WEV	( )	( )	( )	( )	62. JAV	( )	( )	( )	( )
39. YEZ	( )	( )	( )	( )	63. LYM	( )	( )	( )	( )
40. LUT	( )	( )	( )	( )	64. PEB	( )	( )	( )	( )
41. NUP	( )	( )	( )	( )	65. PYC	( )	( )	( )	( )
42. PID	( )	( )	( )	( )	66. WEG	( )	( )	( )	( )
43. GAW	( )	( )	( )	( )	67. WYP	( )	( )	( )	( )
44. KOS	( )	( )	( )	( )	68. BYN	( )	( )	( )	( )
45. KUN	( )	( )	( )	( )	69. DYP	( )	( )	( )	( )
46. CAG	( )	( )	( )	( )	70. TYC	( )	( )	( )	( )
47. FIL	( )	( )	( )	( )	71. ZAC	( )	( )	( )	( )
48. FYX	( )	( )	( )	( )	72. FAV	( )	( )	( )	( )
	(LM)	(LS)	(DS)	(DM)		(LM)	(LS)	(DS)	(DM)

Syllable	(LM)	(LS)	(DS)	(DM)	Syllable	(LM)	(LS)	(DS)	(DM)
73. MOH	( )	( )	( )	( )	98. LOM	( )	( )	( )	( )
74. NAL	( )	( )	( )	( )	99. KEM	( )	( )	( )	( )
75. PIF	( )	( )	( )	( )	100. KIR	( )	( )	( )	( )
76. PIM	( )	( )	( )	( )	101. KOC	( )	( )	( )	( )
77. BEP	( )	( )	( )	( )	102. KYD	( )	( )	( )	( )
78. BYT	( )	( )	( )	( )	103. KAF	( )	( )	( )	( )
79. JEP	( )	( )	( )	( )	104. KEL	( )	( )	( )	( )
80. RIS	( )	( )	( )	( )	105. SYP	( )	( )	( )	( )
81. RIX	( )	( )	( )	( )	106. VIR	( )	( )	( )	( )
82. TOX	( )	( )	( )	( )	107. FIV	( )	( )	( )	( )
83. VIL	( )	( )	( )	( )	108. GES	( )	( )	( )	( )
84. WAH	( )	( )	( )	( )	109. PIZ	( )	( )	( )	( )
85. WAQ	( )	( )	( )	( )	110. QIT	( )	( )	( )	( )
86. WOF	( )	( )	( )	( )	111. RYD	( )	( )	( )	( )
87. GOF	( )	( )	( )	( )	112. NUG	( )	( )	( )	( )
88. NYC	( )	( )	( )	( )	113. TOB	( )	( )	( )	( )
89. PAB	( )	( )	( )	( )	114. KAS	( )	( )	( )	( )
90. PYG	( )	( )	( )	( )	115. DUR	( )	( )	( )	( )
91. KYT	( )	( )	( )	( )	116. DAF	( )	( )	( )	( )
92. TIX	( )	( )	( )	( )	117. DUP	( )	( )	( )	( )
93. VOG	( )	( )	( )	( )	118. HEK	( )	( )	( )	( )
94. WID	( )	( )	( )	( )	119. MAJ	( )	( )	( )	( )
95. WOK	( )	( )	( )	( )	120. NAK	( )	( )	( )	( )
96. LEP	( )	( )	( )	( )	121. PAG	( )	( )	( )	( )
97. LOD	( )	( )	( )	( )	122. SIB	( )	( )	( )	( )
	(LM)	(LS)	(DS)	(DM)		(LM)	(LS)	(DS)	(DM)

Syllable	(LM)	(LS)	(DS)	(DM)	Syllable	(LM)	(LS)	(DS)	(DM)
123. CAY	( )	( )	( )	( )	132. LAR	( )	( )	( )	( )
124. COZ	( )	( )	( )	( )	133. MAH	( )	( )	( )	( )
125. VIK	( )	( )	( )	( )	134. YAW	( )	( )	( )	( )
126. BEY	( )	( )	( )	( )	135. CAV	( )	( )	( )	( )
127. BIF	( )	( )	( )	( )	136. FAC	( )	( )	( )	( )
128. JUS	( )	( )	( )	( )	137. GAV	( )	( )	( )	( )
129. KER	( )	( )	( )	( )	138. RYM	( )	( )	( )	( )
130. RES	( )	( )	( )	( )	139. YEH	( )	( )	( )	( )
131. VAS	( )	( )	( )	( )	140. BIZ	( )	( )	( )	( )
	(LM)	(LS)	(DS)	(DM)		(LM)	(LS)	(DS)	(DM)

APPENDIX B

SELF INVENTORY SCALE

SELF INVENTORY SCALE

O.S.U. Identification No. _____ Age: ___ Birthdate: _____

Phone No. (Home) _____ Educational Classification: _____

Instructor: _____ Class Hour: _____

Instruction: On the following page is a list of paired adjectives. You are to indicate which adjective of each pair is most descriptive of you. For instance, if you judge yourself to be definitely relaxed or definitely tense, you would place an "X" in the appropriate space marked "definitely like me"; if you feel yourself to be somewhat relaxed or somewhat tense, you would place an "X" in one of the spaces marked "somewhat like me"; if you perceive yourself to be slightly relaxed or slightly tense, you would place an "X" in one of the spaces marked "slightly like me."

	Definitely like me	Somewhat like me	Slightly like me	Slightly like me	Somewhat like me	Definitely like me	
Relaxed	_____	_____	_____	_____	_____	_____	Tense

Be sure to make only one mark for each pair of adjectives. Do not worry or puzzle over individual items. It is your first impression, your immediate feelings about the items that we want. On the other hand, do not be careless, because we want your true impressions.

IMPORTANT: Please be as open as possible in your self-assessment. Such openness is crucial to the success of this experiment. Your anonymity will be preserved as your name will not be known to anyone connected with this study. We are interested in your responses to the scale as a group and have no need to identify you individually.

		Definitely like me	Somewhat like me	Slightly like me	Slightly like me	Somewhat like me	Definitely like me	
(1)	DISHONEST	_____	_____	_____	_____	_____	_____	HONEST
(2)	HOT	_____	_____	_____	_____	_____	_____	COLD
(3)	FAST	_____	_____	_____	_____	_____	_____	SLOW
(4)	LARGE	_____	_____	_____	_____	_____	_____	SMALL
(5)	HARD	_____	_____	_____	_____	_____	_____	SOFT
(6)	UNEMOTIONAL	_____	_____	_____	_____	_____	_____	EMOTIONAL
(7)	AWFUL	_____	_____	_____	_____	_____	_____	NICE
(8)	PLEASANT	_____	_____	_____	_____	_____	_____	UNPLEASANT
(9)	CALM	_____	_____	_____	_____	_____	_____	EXCITABLE
(10)	PASSIVE	_____	_____	_____	_____	_____	_____	ACTIVE
(11)	WEAK	_____	_____	_____	_____	_____	_____	STRONG
(12)	HAPPY	_____	_____	_____	_____	_____	_____	SAD
(13)	HEAVY	_____	_____	_____	_____	_____	_____	LIGHT
(14)	BAD	_____	_____	_____	_____	_____	_____	GOOD
(15)	THICK	_____	_____	_____	_____	_____	_____	THIN

APPENDIX C

PHONETIC IMPRESSION INVENTORY FORMS E, P, AND A

PHONETIC IMPRESSION INVENTORY

FORM E

O.S.U. Identification No. _____

This is a test of letter-combination impression. It consists of 140 syllable-like "trigrams" composed of differing letter combinations. You are to read each trigram to yourself and then decide, on the basis of how it "sounds," whether it impresses you as being "very good," "moderately good," "slightly good," "slightly bad," "moderately bad," or "very bad." If you think the trigram sounds very good or very bad, indicate your rating by placing an "X" in the appropriate space labeled "VG" or "VB." If you think the trigram sounds moderately good or moderately bad, place an "X" in the space labeled "MG" or "MB." If the trigram impresses you as sounding slightly good or slightly bad, place an "X" in the appropriate space labeled "SG" or "SB." Please enter only one rating per trigram.

There are no right or wrong answers, in the usual sense, because all answers are equally good. While there is no time limit on this test, you should not linger over any of the trigrams nor try to analyze why they impress you as they do. Remember, no matter how slight your feelings may be, every trigram must be rated to indicate whether you think it is:

VG (very good)
MG (moderately good)
SG (slightly good)
SB (slightly bad)
MB (moderately bad)
VB (very bad)

Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)	Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)
1. JOR	( )	( )	( )	( )	( )	( )	13. BEH	( )	( )	( )	( )	( )	( )
2. RAJ	( )	( )	( )	( )	( )	( )	14. DEH	( )	( )	( )	( )	( )	( )
3. WYR	( )	( )	( )	( )	( )	( )	15. DYX	( )	( )	( )	( )	( )	( )
4. YIR	( )	( )	( )	( )	( )	( )	16. GOZ	( )	( )	( )	( )	( )	( )
5. YOC	( )	( )	( )	( )	( )	( )	17. JOX	( )	( )	( )	( )	( )	( )
6. RYF	( )	( )	( )	( )	( )	( )	18. MOY	( )	( )	( )	( )	( )	( )
7. RYK	( )	( )	( )	( )	( )	( )	19. PEM	( )	( )	( )	( )	( )	( )
8. SEQ	( )	( )	( )	( )	( )	( )	20. QIC	( )	( )	( )	( )	( )	( )
9. NUJ	( )	( )	( )	( )	( )	( )	21. WOB	( )	( )	( )	( )	( )	( )
10. PIV	( )	( )	( )	( )	( )	( )	22. WYM	( )	( )	( )	( )	( )	( )
11. FAP	( )	( )	( )	( )	( )	( )	23. YUH	( )	( )	( )	( )	( )	( )
12. HIB	( )	( )	( )	( )	( )	( )	24. CYK	( )	( )	( )	( )	( )	( )

VG (very good)
MG (moderately good)
SG (slightly good)
SB (slightly bad)
MB (moderately bad)
VB (very bad)

Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)	Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)
25. DYS	( )	( )	( )	( )	( )	( )	49. FAZ	( )	( )	( )	( )	( )	( )
26. HUZ	( )	( )	( )	( )	( )	( )	50. HOZ	( )	( )	( )	( )	( )	( )
27. KEV	( )	( )	( )	( )	( )	( )	51. JUM	( )	( )	( )	( )	( )	( )
28. LIG	( )	( )	( )	( )	( )	( )	52. MUV	( )	( )	( )	( )	( )	( )
29. LIX	( )	( )	( )	( )	( )	( )	53. NAS	( )	( )	( )	( )	( )	( )
30. NEP	( )	( )	( )	( )	( )	( )	54. PIQ	( )	( )	( )	( )	( )	( )
31. TYD	( )	( )	( )	( )	( )	( )	55. SYK	( )	( )	( )	( )	( )	( )
32. VOX	( )	( )	( )	( )	( )	( )	56. WYT	( )	( )	( )	( )	( )	( )
33. YAT	( )	( )	( )	( )	( )	( )	57. ZEL	( )	( )	( )	( )	( )	( )
34. BYK	( )	( )	( )	( )	( )	( )	58. HYT	( )	( )	( )	( )	( )	( )
35. GUC	( )	( )	( )	( )	( )	( )	59. JOD	( )	( )	( )	( )	( )	( )
36. RYN	( )	( )	( )	( )	( )	( )	60. TUS	( )	( )	( )	( )	( )	( )
37. SOV	( )	( )	( )	( )	( )	( )	61. WUD	( )	( )	( )	( )	( )	( )
38. WEV	( )	( )	( )	( )	( )	( )	62. JAV	( )	( )	( )	( )	( )	( )
39. YEZ	( )	( )	( )	( )	( )	( )	63. LYM	( )	( )	( )	( )	( )	( )
40. LUT	( )	( )	( )	( )	( )	( )	64. PEB	( )	( )	( )	( )	( )	( )
41. NUP	( )	( )	( )	( )	( )	( )	65. PYC	( )	( )	( )	( )	( )	( )
42. PID	( )	( )	( )	( )	( )	( )	66. WEG	( )	( )	( )	( )	( )	( )
43. GAW	( )	( )	( )	( )	( )	( )	67. WYP	( )	( )	( )	( )	( )	( )
44. KOS	( )	( )	( )	( )	( )	( )	68. BYN	( )	( )	( )	( )	( )	( )
45. KUN	( )	( )	( )	( )	( )	( )	69. DYP	( )	( )	( )	( )	( )	( )
46. CAG	( )	( )	( )	( )	( )	( )	70. TYC	( )	( )	( )	( )	( )	( )
47. FIL	( )	( )	( )	( )	( )	( )	71. ZAC	( )	( )	( )	( )	( )	( )
48. FYX	( )	( )	( )	( )	( )	( )	72. FAV	( )	( )	( )	( )	( )	( )

Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)	Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)

VG (very good)
MG (moderately good)
SG (slightly good)
SB (slightly bad)
MB (moderately bad)
VB (very bad)

Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)	Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)
73. MOH	( )	( )	( )	( )	( )	( )	98. LOM	( )	( )	( )	( )	( )	( )
74. NAL	( )	( )	( )	( )	( )	( )	99. KEM	( )	( )	( )	( )	( )	( )
75. PIF	( )	( )	( )	( )	( )	( )	100. KIR	( )	( )	( )	( )	( )	( )
76. PIM	( )	( )	( )	( )	( )	( )	101. KOC	( )	( )	( )	( )	( )	( )
77. BEP	( )	( )	( )	( )	( )	( )	102. KYD	( )	( )	( )	( )	( )	( )
78. BYT	( )	( )	( )	( )	( )	( )	103. KAF	( )	( )	( )	( )	( )	( )
79. JEP	( )	( )	( )	( )	( )	( )	104. KEL	( )	( )	( )	( )	( )	( )
80. RIS	( )	( )	( )	( )	( )	( )	105. SYP	( )	( )	( )	( )	( )	( )
81. RIX	( )	( )	( )	( )	( )	( )	106. VIR	( )	( )	( )	( )	( )	( )
82. TOX	( )	( )	( )	( )	( )	( )	107. FIV	( )	( )	( )	( )	( )	( )
83. VIL	( )	( )	( )	( )	( )	( )	108. GES	( )	( )	( )	( )	( )	( )
84. WAH	( )	( )	( )	( )	( )	( )	109. PIZ	( )	( )	( )	( )	( )	( )
85. WAQ	( )	( )	( )	( )	( )	( )	110. QIT	( )	( )	( )	( )	( )	( )
86. WOF	( )	( )	( )	( )	( )	( )	111. RYD	( )	( )	( )	( )	( )	( )
87. GOF	( )	( )	( )	( )	( )	( )	112. NUG	( )	( )	( )	( )	( )	( )
88. NYC	( )	( )	( )	( )	( )	( )	113. TOB	( )	( )	( )	( )	( )	( )
89. PAB	( )	( )	( )	( )	( )	( )	114. KAS	( )	( )	( )	( )	( )	( )
90. PYG	( )	( )	( )	( )	( )	( )	115. DUR	( )	( )	( )	( )	( )	( )
91. KYT	( )	( )	( )	( )	( )	( )	116. DAF	( )	( )	( )	( )	( )	( )
92. TIX	( )	( )	( )	( )	( )	( )	117. DUP	( )	( )	( )	( )	( )	( )
93. VOG	( )	( )	( )	( )	( )	( )	118. HEK	( )	( )	( )	( )	( )	( )
94. WID	( )	( )	( )	( )	( )	( )	119. MAJ	( )	( )	( )	( )	( )	( )
95. WOK	( )	( )	( )	( )	( )	( )	120. NAK	( )	( )	( )	( )	( )	( )
96. LEP	( )	( )	( )	( )	( )	( )	121. PAG	( )	( )	( )	( )	( )	( )
97. LOD	( )	( )	( )	( )	( )	( )	122. SIB	( )	( )	( )	( )	( )	( )

Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)	Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)

VG (very good)
MG (moderately good)
SG (slightly good)
SB (slightly bad)
MB (moderately bad)
VB (very bad)

Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)	Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)
123. CAY	( )	( )	( )	( )	( )	( )	132. LAR	( )	( )	( )	( )	( )	( )
124. COZ	( )	( )	( )	( )	( )	( )	133. MAH	( )	( )	( )	( )	( )	( )
125. VIK	( )	( )	( )	( )	( )	( )	134. YAW	( )	( )	( )	( )	( )	( )
126. BEY	( )	( )	( )	( )	( )	( )	135. CAV	( )	( )	( )	( )	( )	( )
127. BIF	( )	( )	( )	( )	( )	( )	136. FAC	( )	( )	( )	( )	( )	( )
128. JUS	( )	( )	( )	( )	( )	( )	137. GAV	( )	( )	( )	( )	( )	( )
129. KER	( )	( )	( )	( )	( )	( )	138. RYM	( )	( )	( )	( )	( )	( )
130. RES	( )	( )	( )	( )	( )	( )	139. YEH	( )	( )	( )	( )	( )	( )
131. VAS	( )	( )	( )	( )	( )	( )	140. BIZ	( )	( )	( )	( )	( )	( )

Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)	Syllable	(VG)	(MG)	(SG)	(SB)	(MB)	(VB)

PHONETIC IMPRESSION INVENTORY

FORM P

O.S.U. Identification No. _____

This is a test of letter-combination impression. It consists of 140 syllable-like "trigrams" composed of differing letter combinations. You are to read each trigram to yourself and then decide, on the basis of how it "sounds," whether it impresses you as being "very strong," "moderately strong," "slightly strong," "slightly weak," moderately weak," or "very weak." If you think the trigram sounds very strong or very weak, indicate your rating by placing an "X" in the appropriate space labeled "VS" or "VW." If you think the trigram sounds moderately strong or moderately weak, place an "X" in the space labeled "MS" or "MW." If the trigram impresses you as sounding slightly strong or slightly weak, place an "X" in the appropriate space labeled "SS" or "SW." Please enter only one rating per trigram.

There are no right or wrong answers, in the usual sense, because all answers are equally good. While there is no time limit on this test, you should not linger over any of the trigrams nor try to analyze why they impress you as they do. Remember, no matter how slight your feelings may be, every trigram must be rated to indicate whether you think it is:

VS (very strong)
MS (moderately strong)
SS (slightly strong)
SW (slightly weak)
MW (moderately weak)
VW (very weak)

Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)	Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)
1. JOR	( )	( )	( )	( )	( )	( )	13. BEH	( )	( )	( )	( )	( )	( )
2. RAJ	( )	( )	( )	( )	( )	( )	14. DEH	( )	( )	( )	( )	( )	( )
3. WYR	( )	( )	( )	( )	( )	( )	15. DYX	( )	( )	( )	( )	( )	( )
4. YIR	( )	( )	( )	( )	( )	( )	16. GOZ	( )	( )	( )	( )	( )	( )
5. YOC	( )	( )	( )	( )	( )	( )	17. JOX	( )	( )	( )	( )	( )	( )
6. RYF	( )	( )	( )	( )	( )	( )	18. MOY	( )	( )	( )	( )	( )	( )
7. RYK	( )	( )	( )	( )	( )	( )	19. PEM	( )	( )	( )	( )	( )	( )
8. SEQ	( )	( )	( )	( )	( )	( )	20. QIC	( )	( )	( )	( )	( )	( )
9. NUJ	( )	( )	( )	( )	( )	( )	21. WOB	( )	( )	( )	( )	( )	( )
10. PIV	( )	( )	( )	( )	( )	( )	22. WYM	( )	( )	( )	( )	( )	( )
11. FAP	( )	( )	( )	( )	( )	( )	23. YUH	( )	( )	( )	( )	( )	( )
12. HIB	( )	( )	( )	( )	( )	( )	24. CYK	( )	( )	( )	( )	( )	( )

VS (very strong)
MS (moderatelv strong)
SS (slightly strong)
SW (slightly weak)
MW (moderately weak)
VW (very weak)

Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)	Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)
25. DYS	( )	( )	( )	( )	( )	( )	49. FAZ	( )	( )	( )	( )	( )	( )
26. HUZ	( )	( )	( )	( )	( )	( )	50. HOZ	( )	( )	( )	( )	( )	( )
27. KEV	( )	( )	( )	( )	( )	( )	51. JUM	( )	( )	( )	( )	( )	( )
28. LIG	( )	( )	( )	( )	( )	( )	52. MUV	( )	( )	( )	( )	( )	( )
29. LIX	( )	( )	( )	( )	( )	( )	53. NAS	( )	( )	( )	( )	( )	( )
30. NEP	( )	( )	( )	( )	( )	( )	54. PIQ	( )	( )	( )	( )	( )	( )
31. TYD	( )	( )	( )	( )	( )	( )	55. SYK	( )	( )	( )	( )	( )	( )
32. VOX	( )	( )	( )	( )	( )	( )	56. WYT	( )	( )	( )	( )	( )	( )
33. YAT	( )	( )	( )	( )	( )	( )	57. ZEL	( )	( )	( )	( )	( )	( )
34. BYK	( )	( )	( )	( )	( )	( )	58. HYT	( )	( )	( )	( )	( )	( )
35. GUC	( )	( )	( )	( )	( )	( )	59. JOD	( )	( )	( )	( )	( )	( )
36. RYN	( )	( )	( )	( )	( )	( )	60. TUS	( )	( )	( )	( )	( )	( )
37. SOV	( )	( )	( )	( )	( )	( )	61. WUD	( )	( )	( )	( )	( )	( )
38. WEV	( )	( )	( )	( )	( )	( )	62. JAV	( )	( )	( )	( )	( )	( )
39. YEZ	( )	( )	( )	( )	( )	( )	63. LYM	( )	( )	( )	( )	( )	( )
40. LUT	( )	( )	( )	( )	( )	( )	64. PEB	( )	( )	( )	( )	( )	( )
41. NUP	( )	( )	( )	( )	( )	( )	65. PYC	( )	( )	( )	( )	( )	( )
42. PID	( )	( )	( )	( )	( )	( )	66. WEG	( )	( )	( )	( )	( )	( )
43. GAW	( )	( )	( )	( )	( )	( )	67. WYP	( )	( )	( )	( )	( )	( )
44. KOS	( )	( )	( )	( )	( )	( )	68. BYN	( )	( )	( )	( )	( )	( )
45. KUN	( )	( )	( )	( )	( )	( )	69. DYP	( )	( )	( )	( )	( )	( )
46. CAG	( )	( )	( )	( )	( )	( )	70. TYC	( )	( )	( )	( )	( )	( )
47. FIL	( )	( )	( )	( )	( )	( )	71. ZAC	( )	( )	( )	( )	( )	( )
48. FYX	( )	( )	( )	( )	( )	( )	72. FAV	( )	( )	( )	( )	( )	( )

Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)	Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)

VS (very strong)
MS (moderately strong)
SS (slightly strong)
SW (slightly weak)
MW (moderately weak)
VW (very weak)

Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)	Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)
73. MOH	( )	( )	( )	( )	( )	( )	98. LOM	( )	( )	( )	( )	( )	( )
74. NAL	( )	( )	( )	( )	( )	( )	99. KEM	( )	( )	( )	( )	( )	( )
75. PIF	( )	( )	( )	( )	( )	( )	100. KIR	( )	( )	( )	( )	( )	( )
76. PIM	( )	( )	( )	( )	( )	( )	101. KOC	( )	( )	( )	( )	( )	( )
77. BEP	( )	( )	( )	( )	( )	( )	102. KYD	( )	( )	( )	( )	( )	( )
78. BYT	( )	( )	( )	( )	( )	( )	103. KAF	( )	( )	( )	( )	( )	( )
79. JEP	( )	( )	( )	( )	( )	( )	104. KEL	( )	( )	( )	( )	( )	( )
80. RIS	( )	( )	( )	( )	( )	( )	105. SYP	( )	( )	( )	( )	( )	( )
81. RIX	( )	( )	( )	( )	( )	( )	106. VIR	( )	( )	( )	( )	( )	( )
82. TOX	( )	( )	( )	( )	( )	( )	107. FIV	( )	( )	( )	( )	( )	( )
83. VIL	( )	( )	( )	( )	( )	( )	108. GES	( )	( )	( )	( )	( )	( )
84. WAH	( )	( )	( )	( )	( )	( )	109. PIZ	( )	( )	( )	( )	( )	( )
85. WAQ	( )	( )	( )	( )	( )	( )	110. QIT	( )	( )	( )	( )	( )	( )
86. WOF	( )	( )	( )	( )	( )	( )	111. RYD	( )	( )	( )	( )	( )	( )
87. GOF	( )	( )	( )	( )	( )	( )	112. NUG	( )	( )	( )	( )	( )	( )
88. NYC	( )	( )	( )	( )	( )	( )	113. TOB	( )	( )	( )	( )	( )	( )
89. PAB	( )	( )	( )	( )	( )	( )	114. KAS	( )	( )	( )	( )	( )	( )
90. PYG	( )	( )	( )	( )	( )	( )	115. DUR	( )	( )	( )	( )	( )	( )
91. KYT	( )	( )	( )	( )	( )	( )	116. DAF	( )	( )	( )	( )	( )	( )
92. TIX	( )	( )	( )	( )	( )	( )	117. DUP	( )	( )	( )	( )	( )	( )
93. VOG	( )	( )	( )	( )	( )	( )	118. HEK	( )	( )	( )	( )	( )	( )
94. WID	( )	( )	( )	( )	( )	( )	119. MAJ	( )	( )	( )	( )	( )	( )
95. WOK	( )	( )	( )	( )	( )	( )	120. NAK	( )	( )	( )	( )	( )	( )
96. LEP	( )	( )	( )	( )	( )	( )	121. PAG	( )	( )	( )	( )	( )	( )
97. LOD	( )	( )	( )	( )	( )	( )	122. SIB	( )	( )	( )	( )	( )	( )

Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)	Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)

VS (very strong)
MS (moderately strong)
SS (slightly strong)
SW (slightly weak)
MW (moderately weak)
VW (very weak)

Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)	Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)
123. CAY	( )	( )	( )	( )	( )	( )	132. LAR	( )	( )	( )	( )	( )	( )
124. COZ	( )	( )	( )	( )	( )	( )	133. MAH	( )	( )	( )	( )	( )	( )
125. VIK	( )	( )	( )	( )	( )	( )	134. YAW	( )	( )	( )	( )	( )	( )
126. BEY	( )	( )	( )	( )	( )	( )	135. CAV	( )	( )	( )	( )	( )	( )
127. BIF	( )	( )	( )	( )	( )	( )	136. FAC	( )	( )	( )	( )	( )	( )
128. JUS	( )	( )	( )	( )	( )	( )	137. GAV	( )	( )	( )	( )	( )	( )
129. KER	( )	( )	( )	( )	( )	( )	138. RYM	( )	( )	( )	( )	( )	( )
130. RES	( )	( )	( )	( )	( )	( )	139. YEH	( )	( )	( )	( )	( )	( )
131. VAS	( )	( )	( )	( )	( )	( )	140. BIZ	( )	( )	( )	( )	( )	( )

Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)	Syllable	(VS)	(MS)	(SS)	(SW)	(MW)	(VW)

PHONETIC IMPRESSION INVENTORY

FORM A

O.S.U. Identification No. _____

This is a test of letter-combination impression. It consists of 140 syllable-like "trigrams" composed of differing letter combinations. You are to read each trigram to yourself and then decide, on the basis of how it "sounds," whether it impresses you as being "very active," "moderately active," "slightly active," "slightly passive," "moderately passive," or "very passive." If you think the trigram sounds very active or very passive, indicate your rating by placing an "X" in the appropriate space labeled "VA" or "VP." If you think the trigram sounds moderately active or moderately passive, place an "X" in the space labeled "MA" or "MP." If the trigram impresses you as sounding slightly active or slightly passive, place an "X" in the appropriate space labeled "SA" or "SP." Please enter only one rating per trigram.

There are no right or wrong answers, in the usual sense, because all answers are equally good. While there is no time limit on this test, you should not linger over any of the trigrams nor try to analyze why they impress You as they do. Remember, no matter how slight your feelings may be, every trigram must be rated to indicate whether you think it is:

VA (very active)
MA (moderately active)
SA (slightly active)
SP (slightly passive)
MP (moderately passive)
VP (very passive)

Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)	Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)
1. JOR	( )	( )	( )	( )	( )	( )	13. BEH	( )	( )	( )	( )	( )	( )
2. RAJ	( )	( )	( )	( )	( )	( )	14. DEH	( )	( )	( )	( )	( )	( )
3. WYR	( )	( )	( )	( )	( )	( )	15. DYX	( )	( )	( )	( )	( )	( )
4. YIR	( )	( )	( )	( )	( )	( )	16. GOZ	( )	( )	( )	( )	( )	( )
5. YOC	( )	( )	( )	( )	( )	( )	17. JOX	( )	( )	( )	( )	( )	( )
6. RYF	( )	( )	( )	( )	( )	( )	18. MOY	( )	( )	( )	( )	( )	( )
7. RYK	( )	( )	( )	( )	( )	( )	19. PEM	( )	( )	( )	( )	( )	( )
8. SEQ	( )	( )	( )	( )	( )	( )	20. QIC	( )	( )	( )	( )	( )	( )
9. NUJ	( )	( )	( )	( )	( )	( )	21. WOB	( )	( )	( )	( )	( )	( )
10. PIV	( )	( )	( )	( )	( )	( )	22. WYM	( )	( )	( )	( )	( )	( )
11. FAP	( )	( )	( )	( )	( )	( )	23. YUH	( )	( )	( )	( )	( )	( )
12. HIB	( )	( )	( )	( )	( )	( )	24. CYK	( )	( )	( )	( )	( )	( )

VA (very active)
MA (moderately active)
SA (slightly active)
SP (slightly passive)
MP (moderately passive)
VP (very passive)

Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)	Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)
25. DYS	( )	( )	( )	( )	( )	( )	49. FAZ	( )	( )	( )	( )	( )	( )
26. HUZ	( )	( )	( )	( )	( )	( )	50. HOZ	( )	( )	( )	( )	( )	( )
27. KEV	( )	( )	( )	( )	( )	( )	51. JUM	( )	( )	( )	( )	( )	( )
28. LIG	( )	( )	( )	( )	( )	( )	52. MUV	( )	( )	( )	( )	( )	( )
29. LIX	( )	( )	( )	( )	( )	( )	53. NAS	( )	( )	( )	( )	( )	( )
30. NEP	( )	( )	( )	( )	( )	( )	54. PIQ	( )	( )	( )	( )	( )	( )
31. TYD	( )	( )	( )	( )	( )	( )	55. SYK	( )	( )	( )	( )	( )	( )
32. VOX	( )	( )	( )	( )	( )	( )	56. WYT	( )	( )	( )	( )	( )	( )
33. YAT	( )	( )	( )	( )	( )	( )	57. ZEL	( )	( )	( )	( )	( )	( )
34. BYK	( )	( )	( )	( )	( )	( )	58. HYT	( )	( )	( )	( )	( )	( )
35. GUC	( )	( )	( )	( )	( )	( )	59. JOD	( )	( )	( )	( )	( )	( )
36. RYN	( )	( )	( )	( )	( )	( )	60. TUS	( )	( )	( )	( )	( )	( )
37. SOV	( )	( )	( )	( )	( )	( )	61. WUD	( )	( )	( )	( )	( )	( )
38. WEV	( )	( )	( )	( )	( )	( )	62. JAV	( )	( )	( )	( )	( )	( )
39. YEZ	( )	( )	( )	( )	( )	( )	63. LYM	( )	( )	( )	( )	( )	( )
40. LUT	( )	( )	( )	( )	( )	( )	64. PEB	( )	( )	( )	( )	( )	( )
41. NUP	( )	( )	( )	( )	( )	( )	65. PYC	( )	( )	( )	( )	( )	( )
42. PID	( )	( )	( )	( )	( )	( )	66. WEG	( )	( )	( )	( )	( )	( )
43. GAW	( )	( )	( )	( )	( )	( )	67. WYP	( )	( )	( )	( )	( )	( )
44. KOS	( )	( )	( )	( )	( )	( )	68. BYN	( )	( )	( )	( )	( )	( )
45. KUN	( )	( )	( )	( )	( )	( )	69. DYP	( )	( )	( )	( )	( )	( )
46. CAG	( )	( )	( )	( )	( )	( )	70. TYC	( )	( )	( )	( )	( )	( )
47. FIL	( )	( )	( )	( )	( )	( )	71. ZAC	( )	( )	( )	( )	( )	( )
48. FYX	( )	( )	( )	( )	( )	( )	72. FAV	( )	( )	( )	( )	( )	( )

Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)	Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)

VA (very active)
MA (moderately active)
SA (slightly active)
SP (slightly passive)
MP (moderately passive)
VP (very passive)

Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)	Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)
73. MOH	( )	( )	( )	( )	( )	( )	98. LOM	( )	( )	( )	( )	( )	( )
74. NAL	( )	( )	( )	( )	( )	( )	99. KEM	( )	( )	( )	( )	( )	( )
75. PIF	( )	( )	( )	( )	( )	( )	100. KIR	( )	( )	( )	( )	( )	( )
76. PIM	( )	( )	( )	( )	( )	( )	101. KOC	( )	( )	( )	( )	( )	( )
77. BEP	( )	( )	( )	( )	( )	( )	102. KYD	( )	( )	( )	( )	( )	( )
78. BYT	( )	( )	( )	( )	( )	( )	103. KAF	( )	( )	( )	( )	( )	( )
79. JEP	( )	( )	( )	( )	( )	( )	104. KEL	( )	( )	( )	( )	( )	( )
80. RIS	( )	( )	( )	( )	( )	( )	105. SYP	( )	( )	( )	( )	( )	( )
81. RIX	( )	( )	( )	( )	( )	( )	106. VIR	( )	( )	( )	( )	( )	( )
82. TOX	( )	( )	( )	( )	( )	( )	107. FIV	( )	( )	( )	( )	( )	( )
83. VIL	( )	( )	( )	( )	( )	( )	108. GES	( )	( )	( )	( )	( )	( )
84. WAH	( )	( )	( )	( )	( )	( )	109. PIZ	( )	( )	( )	( )	( )	( )
85. WAQ	( )	( )	( )	( )	( )	( )	110. QIT	( )	( )	( )	( )	( )	( )
86. WOF	( )	( )	( )	( )	( )	( )	111. RYD	( )	( )	( )	( )	( )	( )
87. GOF	( )	( )	( )	( )	( )	( )	112. NUG	( )	( )	( )	( )	( )	( )
88. NYC	( )	( )	( )	( )	( )	( )	113. TOB	( )	( )	( )	( )	( )	( )
89. PAB	( )	( )	( )	( )	( )	( )	114. KAS	( )	( )	( )	( )	( )	( )
90. PYG	( )	( )	( )	( )	( )	( )	115. DUR	( )	( )	( )	( )	( )	( )
91. KYT	( )	( )	( )	( )	( )	( )	116. DAF	( )	( )	( )	( )	( )	( )
92. TIX	( )	( )	( )	( )	( )	( )	117. DUP	( )	( )	( )	( )	( )	( )
93. VOG	( )	( )	( )	( )	( )	( )	118. HEK	( )	( )	( )	( )	( )	( )
94. WID	( )	( )	( )	( )	( )	( )	119. MAJ	( )	( )	( )	( )	( )	( )
95. WOK	( )	( )	( )	( )	( )	( )	120. NAK	( )	( )	( )	( )	( )	( )
96. LEP	( )	( )	( )	( )	( )	( )	121. PAG	( )	( )	( )	( )	( )	( )
97. LOD	( )	( )	( )	( )	( )	( )	122. SIB	( )	( )	( )	( )	( )	( )

Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)	Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)

VA (very active)
MA (moderately active)
SA (slightly active)
SP (slightly passive)
MP (moderately passive)
VP (very passive)

Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)	Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)
123. CAY	( )	( )	( )	( )	( )	( )	132. LAR	( )	( )	( )	( )	( )	( )
124. COZ	( )	( )	( )	( )	( )	( )	133. MAH	( )	( )	( )	( )	( )	( )
125. VIK	( )	( )	( )	( )	( )	( )	134. YAW	( )	( )	( )	( )	( )	( )
126. BEY	( )	( )	( )	( )	( )	( )	135. CAV	( )	( )	( )	( )	( )	( )
127. BIF	( )	( )	( )	( )	( )	( )	136. FAC	( )	( )	( )	( )	( )	( )
128. JUS	( )	( )	( )	( )	( )	( )	137. GAV	( )	( )	( )	( )	( )	( )
129. KER	( )	( )	( )	( )	( )	( )	138. RYM	( )	( )	( )	( )	( )	( )
130. RES	( )	( )	( )	( )	( )	( )	139. YEH	( )	( )	( )	( )	( )	( )
131. VAS	( )	( )	( )	( )	( )	( )	140. BIZ	( )	( )	( )	( )	( )	( )

Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)	Syllable	(VA)	(MA)	(SA)	(SP)	(MP)	(VP)

APPENDIX D

COMPUTER PROGRAM FOR THE GENERATION OF TRIGRAM LISTS

```
10 '-------------------------------------------------------------------
20 '    Special version of original program. September 1984.
30 '
40 'OBJECT: Pick 12 trigrams (6 HIGH and 6 LOW) for each person
50 '        subject to the following constraints:
60 '
70 '         1. Any trigram chosen must have been rated by person
80 '            in the same manner on two separate occasions.
90 '
100 '        2. Any given trigram chosen must appear an even number
110 '           of times amongst all of the generated lists. Of this
120 '           even number of occurences, half must appear rated
130 '           HIGH and the other half rated LOW.
140 '-------------------------------------------------------------------
150 '
160 TRUE=-1: FALSE=0                    'create psuedo boolean type
170 HIGH=1: LOW=2: CANCEL=0             'response types
180 NUMACROSS=4                         'number of persons to print across page
190 NUMSUBJECTS=20                      'number of people in group (constant)
200 NUMTRIGRAMS=140                     'number of trigrams/person (constant)
210 '
220 DIM TRIGRAM$(NUMTRIGRAMS)           'names of trigrams
230 DIM DAT(NUMSUBJECTS,NUMTRIGRAMS)'subject responses (HIGH, LOW, CANCEL)
240 DIM NUM(NUMSUBJECTS,2)              'flag array: check num subject trigrams
250 DIM SELECT(NUMSUBJECTS,2,6)         'contains selected trigrams
260 '
265 OPEN "I",1,"Trigram Ratings"
270 GOSUB 1030                          'read names of trigrams
280 GOSUB 820                           'read in trigram responses
290 GOSUB 350                           'select trigrams
300 GOSUB 620                           'print selected trigrams
310 END
320 '
330 '------------------ SUBROUTINES -------------------
340 '
350 '----SUBR: select trigrams
360 FOR TRIGRAM=1 TO NUMTRIGRAMS 'consider each trigram
370   I=1: J=2: QUIT=FALSE
380   WHILE I(=NUMSUBJECTS
390     C1=DAT(I,TRIGRAM): IF C1=CANCEL GOTO 470
400     IF NUM(I,C1))=6 GOTO 470 'all done w/this list
410     WHILE J(=NUMSUBJECTS
420        C2=DAT(J,TRIGRAM): IF C2=CANCEL GOTO 450
430        IF NUM(J,C2) =6 GOTO 450 'all done w/this list
440        IF (C1=LOW AND C2=HIGH) OR (C1=HIGH AND C2=LOW) THEN GOSUB 520
450        J=J+1
460     WEND
470     I=I+1: J=I+1
480   WEND
490 NEXT TRIGRAM
500 RETURN
510 '
520 '----SUBR: put selected trigrams on respective lists
```

```
530 NUM(I,C1)=NUM(I,C1)+1
540 NUM(J,C2)=NUM(J,C2)+1
550 SELECT(I,C1,NUM(I,C1))=TRIGRAM
560 SELECT(J,C2,NUM(J,C2))=TRIGRAM
570 DAT(I,TRIGRAM)=CANCEL
580 DAT(J,TRIGRAM)=CANCEL
590 J=NUMSUBJECTS+1
600 RETURN
610 '
620 '----SUBR: print selected trigrams
630 FOR I=1 TO NUMSUBJECTS STEP NUMACROSS
640  FOR L=1 TO NUMACROSS
650   IF I+L-1(=NUMSUBJECTS THEN LPRINT "SUBJECT"I+L-1"       ":
660  NEXT L
670  LPRINT
680  FOR K=1 TO 6
690   FOR L=1 TO NUMACROSS
700    FOR J=1 TO 2
710     IF I+L-1 NUMSUBJECTS GOTO 740
720     IF SELECT (I+L-1,J,K)=0 THEN LPRINT "   ";"      ";: GOTO 740
730     LPRINT TRIGRAM$(SELECT(I+L-1,J,K))"       ";
740    NEXT J
750   NEXT L
760   LPRINT
770  NEXT K
780  LPRINT
790 NEXT I
800 RETURN
810 '
820 '----SUBR: create random test data
830 FOR I=1 TO NUMSUBJECTS
840  FOR J=1 TO NUMTRIGRAMS

880  NEXT J
890 NEXT I
900 '-- print out test data
910 LPRINT: LPRINT
920 FOR I=1 TO NUMSUBJECTS
930   LPRINT USING "##  ";I;
940   FOR J=1 TO NUMTRIGRAMS
950     IF DAT(I,J)=HIGH THEN LPRINT "H ";: GOTO 970
960     IF DAT(I,J)=LOW THEN LPRINT "L "; ELSE LPRINT "  ";
970   NEXT J
980   LPRINT
990 NEXT I
1000 LPRINT: LPRINT
1010 RETURN
1020 '
1030 '----SUBR: read names of trigrams
1040 FOR I=1 TO NUMTRIGRAMS: READ TRIGRAM$(I): NEXT I: RETURN
1050 '
1060 '-------------------- TRIGRAM NAMES -----------------
1070 '
1080 DATA JOR,RAJ,WYR,YIR,YOC,RYF,RYK,SEQ,NUJ,PIV,PAP,HIB,BEH,DEH
1090 DATA DYX,GOZ,JOX,MOY,PEM,QIC,WOB,WYM,YUH,CYK,DYS,HUZ,KEV,LIG
1100 DATA LIX,NEP,TYD,VOX,YAT,BYK,GUC,RYN,SOV,WEV,YEZ,LUT,NUP,PID
```

```
1110 DATA GAW,KOS,KUN,CAG,FIL,FYX,FAZ,HOZ,JUM,MUV,NAS,PIQ,SYK,WYT
1120 DATA ZEL,HYT,JOD,TUS,WUD,JAV,LYM,PEB,PYC,WEG,WYP,BYN,DYP,TYC
1130 DATA ZAC,FAV,MOH,NAL,PIF,PIM,BEP,BYT,JEP,RIS,RIX,TOX,VIL,WAH
1140 DATA WAQ,WOF,GOF,NYC,PAR,PYG,KYT,TOX,VOG,WID,WOD,LEP,LOD,LOM
1150 DATA KEM,KIR,KOC,KYD,KAF,KEL,SYP,VIR,FIV,GES,PIZ,QIT,RYD,NUG
1160 DATA TOB,KAS,DUR,DAF,DUP,HEK,MAJ,NAK,PAG,SIB,GAY,COZ,VIK,BEY
1170 DATA BIF,JUS,KER,RES,VAS,LAR,MAH,YAW,GAV,FAC,GAV,RYM,YEH,BIZ
```

APPENDIX E

FREE RECALL TASK INSTRUCTIONS

This part of the experiment involves a memory task. I am going to show you a series of 12 three-letter syllables, one at a time, for four seconds each. When all 12 syllables have been presented, I will hand you a sheet of paper with 12 spaces printed on it. You are to print on this sheet as many of the syllables as you can remember. They do not have to be in the order in which they were presented to you. You will be given 60 seconds to do this. I will then collect the sheet of paper. We will repeat this process until you can remember all 12 syllables correctly on two consecutive trials.

Do you have any questions?

Are you ready?

Let's begin.

APPENDIX F

FREE RECALL TASK ANSWER SHEET

Subject's University Identification No.: _____

Trial: _____

PLEASE PRINT LEGIBLY

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

VITA

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