VERBAL LEARNING AS A FUNCTION OF SEMANTIC DIFFERENTIAL RATINGS OF SELF AND CVC TRIGRAMS

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CHAPTER I

INTRODUCTION

A subject which has occupied verbal learning theorists for many decades is that of meaningfulness and its relationship to the verbal learning process. While numerous variables have been seen to exercise an influence upon this process, meaningfulness has been, by far, one of the most prominent (Underwood & Schulz, 1960). Meaningfulness, as Noble (1963) has indicated, is to be distinguished from meaning. Meaning is a term which denotes a specified relationship between an item (word, trigram, letter, sign, or symbol) and its referent, the latter taken to be the import or significance of the former. Meaningfulness, on the other hand, refers to the extent of the signficance or import that any such item has for an individual or group of individuals.

Over the years, there have been many attempts made to define and measure the concept of meaningfulness. Efforts to define meaningfulness in operational terms had their beginning in the work of Glaze (1928). Glaze employed a group of 15 subjects to whom he exposed, for a period of approximately two seconds each, over 2,000 nonsense syllables or consonant-vowel-consonant (CVC) trigrams. Each subject was instructed to indicate in one or two words what the syllable meant to him. In Glaze's terms, if 100 percent of his sample of 15 subjects responded to a syllable, then that syllable had 100 percent association value (AV), or, in other words, a very high degree of meaningfulness. If, however, a

syllable like "XUH" elicited no response from any subject, its AV or meaningfulness was equal to zero.

Following the work of Glaze, several other standardizations of association values have appeared over the years (Hull, 1933; Krueger, 1934; Witmer, 1935). A monumental restandardization of Glaze's CVC syllables appeared in 1960 (Archer, 1960). Archer values have replaced the Glaze values in many of the post-1960 studies relating association value to acquisition.

Noble (1952) introduced another conceptualization of meaningfulness labeled "production value" or "m." Production value is operationally defined by the average number of words which groups of subjects successively associate with a paralog (e.g., gojey) or word over a fixed period of time (e.g., 60 seconds in Noble's 1952 study). Later, Mandler (1956) determined production values for 100 nonsense syllables selected from the Glaze and Krueger standardizations of association values.

A third approach to meaningfulness is to have subjects rate a series of items along some specified dimension. Noble, Stockwell, and Pryer (1957) had their subjects rate 100 nonsense syllables on a five-point scale ("none, below average, average, above average, and very many") in terms of the number of things or ideas the item suggested to them. The rated value of an item is its mean rating for any given sample. Rated values correlate only moderately (r's of approximately 0.72) with production values of nonsense syllables (Noble, 1963).

Other variables related to these measures of meaningfulness are familiarity and pronunciability. Familiarity is generally defined as how frequently a subject had had contact with a word. Word counts are available, such as the Thorndike-Lorge (1944) tables that list the frequency

with which the 30,000 most often used words in the English language occur in writing. Familiarity (or frequency) has shown a correlation value of 0.92 with Noble's m as determined by his production method (Noble, 1953). Pronunciability shows a lower correlation with Noble's m values of 0.78 (Underwood & Schulz, 1960.)

While the associative approaches to meaningfulness have focused on its quantitative aspects, Osgood (Osgood, Suci & Tannenbaum, 1957) chose to investigate the qualitative aspects of meaning and developed a scaling device to measure such dimensions known as the semantic differential technique. This technique consists of having a subject describe a given word via a series of seven-point scales, each of which is bounded at either end by one of a pair of bi-polar adjectives. For example:

MOTHER

good ____:____:____:____:____:____:____ bad

By the placement of an "X" in one of these seven spaces, the subject indicates both the meaning the word has for him/her and the intensity of that meaning. The meaning is designated by the direction of the X (i.e., which adjective it is closer to) and the intensity is indicated by the distance of the X from the center position in the scale.

Osgood and Suci (1955) paired 50 such descriptive scales with 20 words in all possible combinations in their factor analytic study of meaning. The results of two such separate investigations revealed the existence of three orthogonal factors: an evaluative factor (E) which accounted for over half of the extracted variance, a potency factor (P), and an activity (A) factor. These findings led Osgood to postulate the existence of a semantic space comprised of three dimensions along which the meaning of a word or a concept could be described.

Jenkins, Russell, and Suci (1958) later made available an atlas of semantic profiles for 360 concepts rated on 20 bi-polar scales using the semantic differential technique. Jenkins (1960) constructed a formula to determine the intensity or degree of polarization for any word or concept measured by the semantic differential technique and termed this measure of intensity a concept's "meaningfulness." Noble (1958) also devised a measure of intensity which he called "emotionality" or "e." He found the correlation between e and m to be 0.57.

Another approach to the measurement of meaningfulness advanced by Rychlak is reinforcment value or RV (Rychlak, 1977). Reinforcement value refers to the affective assessment or judgment made by a subject of various materials (verbal, pictorial, etc.) he/she may be asked to learn in an experimental situation. This process is realized by having the subject pre-rate such materials according to a four-step scale of "like much, like slightly, dislike slightly, and dislike much" (Rychlak, 1977). Rychlak's reinforcement value measure is designed to tap both the connotative or "affective" meaningfulness that an item may have for an individual and its intensity.

One of the claims recently made by Rychlak is that Osgood's evaluative dimension (E) is methodologically similar to reinforcement value as a measure of meaningfulness (Rychlak, Flynn & Burger, 1979). Rychlak's proposition is based on the results of several different studies which were designed to test for this possibility. This research will be examined in the literature review which follows.

Most of the research on associative and affective meaningfulness has been conducted via learning or memory tasks. Although countless studies have been generated from the associative approach, research in

the area of affective meaningfulness as related to the verbal learning process is relatively sparse except for the work of Rychlak. This study's review of the literature, therefore, will focus primarily on investigations devoted to examining the influence of affect upon the verbal learning process. Particular attention will be devoted to an examination of Rychlak's work and the relation of the RV dimension to both AV and Osgood's E.

CHAPTER II

REVIEW OF THE LITERATURE

Studies focusing on the influence of feeling or affect on the verbal learning process have had a long history in the literature. The earliest study of this kind, following the classical methods of memory experimentation, was conducted by Tait (1913). Tait constructed, on the basis of his own classification, lists of 20 pleasant (P), 20 unpleasant (U), and 20 indifferent (I) words. Following a free recall task format, Tait read these lists to 11 subjects who were then asked to reproduce them. Memory was tested by a combination of reproduction and recognition. The results obtained by him indicated that, on the average, about 10.5 P, 8.1 U, and 6.1 I words were recalled immediately after the single reading of the lists.

Tolman (1917), in a study of retroactive inhibition, constructed lists containing words that he had classified as "pleasant," "unpleasant," and "indifferent." Each word category was represented in two ten-word lists. All six of the subjects were asked to memorize the lists which were recited several times, and then to reproduce them orally. It was found that the average number of repetitions for P words was 11.5; for I words, 12.7; and for U words, 13.5. While both Tait and Tolman found a prevalence of P over U and I words, Tait found the U words were favored over I words but Tolman's results indicated the contrary.

Although at first the P, U, and I words were arbitrarily selected by the investigators, psychogalvanic skin response (PGR) measurements were later used to indicate the accuracy of this selection. For example, Smith (1921), who also used a free recall format, measured the "affectual tone" of 100 pre-selected stimulus words by means of the psychogalvanic method and then asked his 50 subjects to memorize 30 words arbitrarily selected by him from the original 100. He found that higher emotional arousal, as measured by the galvanometer, both facilitated and impeded recall, depending upon whether the word was "pleasant" or "unpleasant." That is, P and I words were better remembered than U words.

Smith's experiment was repeated, and his findings corroborated, by Jones (1929). Lynch (1932), using the same word lists and PGR measurements of Smith and Jones, gave his subjects immediate and delayed recognition tests. His results, however, showed a P-U-I sequence of recognition facility.

The arbitrary selection and classification by the experimenter of words having a positive, negative, or indifferent affectual tone, and the use of PGR measurements to corroborate this selection, were followed by studies in which the emotional tone of words used as learnable materials was established by group judgments. Efforts were also made by these investigators to try other learning formats, such as paired-associates tasks, and to control for variables such as serial position, exposure time, association value, and reliability of P-U-I ratings. With one exception (Chaney & Lauer, 1929), in which PUI ratings of stimulus words were determined by a panel of independent judges, these studies corroborated earlier results--that pleasant material is more easily learned than either unpleasant or indifferent material. Where indifferent words

were also used as part of the learning task, it was found that unpleasant material exerted a greater facilitative effect on learning than indifferent material.

Following a paired-associates task format, Carter, Jones, and Shock (1934) and Carter (1935, 1936) conducted five experiments which involved pictures as stimuli and P, U, and I words as responses. Preliminary to the learning of the picture/word pairs, the subjects (100 elementary school children) classified words into five categories ranging from "very pleasant" to "very unpleasant." Average ratings for each word were calculated, and on the basis of the group scores, eight P, eight I, and eight U words were selected for the learning task. These lists were presented six times in randomized order to each subject, five seconds per item. The results of all five experiments demonstrated that P words were better remembered than either the I or U words, and U words were better remembered than I words.

These results were corroborated by Carter and Jones (1937) in an identical paired associates task with 100 college students. P words were learned better than the U words, and both were learned better than the I words. The difference between any two of these categories was statistically significant.

White and Ratliff (1934) conducted a free recall experiment in which 150 college students were asked to classify 240 pre-selected words as either "very pleasant," "pleasant," "indifferent," "unpleasant," and "very unpleasant" on two different occasions. Based on these ratings, two 15-item lists, comprised of five P, five U, and five I words, were presented once, at a two-second-per-word exposure interval, to 239 new subjects taken in groups of approximately 20 each. Two different

arrangements of the words were presented so as to offset the advantage of position in the series. The subjects were asked to write all the words remembered immediately after the experimenter finished reading the list. Results indicated that the majority of subjects remembered more P than U words (135 to 65) and that the difference was statistically significant. As the indifferent words had been found to be unreliably rated, no results were presented concerning them.

White (1936) corroborated these findings in two delayed recall tasks. The lists of stimulus words used in these studies were the same as those used in the earlier experiment. The subjects were, however, different from those who participated in the earlier study.

A follow-up, paired-associates task conducted by White and Powell (1936) was the first attempt reported in the literature to control for association value (AV). On the basis of a free association study with 108 subjects, the experimenters selected five P and five U words so that the P words and the U words had an equal number of associations. The 20 stimulus words from which these 10 words were derived had been rated as pleasant or unpleasant by subjects in a previous set of experiments. Each word was paired with the response most frequently given by the 108 subjects. These pairs were then randomly ordered and presented orally and individually at a two to three second-per-pair rate to 16 of the original 108 subjects. After learning by the anticipation method to a criterion of two perfect trials in succession, subjects were presented with the stimulus word twice and instructed each time to say the response word as quickly as possible. Thirteen of the 16 subjects showed a longer reaction time for the U words than for the P words, with the mean reaction time for the U words being 1.20 seconds, and for the P words being

1.03 seconds. This same experiment was conducted with 21 subjects using numbers as responses and similar results were obtained. In a second word-number study, White and Powell (1936) selected the stimulus words on the basis of the individual association values of the subjects, thus using different words for each subject. Again, 19 out of 21 subjects showed longer reaction times for U words than for P words.

The next decade ushered in a host of studies which demonstrated more sophisticated experimental techniques 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 unanimously confirmed earlier findings that pleasant words are more easily recalled than unpleasant words.

Thomson (1930) conducted an experiment with 128 high school students who were divided into two groups and individually asked to make a list of 20 words which had very pleasant connotations and 20 very unpleasant ones. These words were then learned and recalled at the end of one month's time. For the first group the mean recall score for pleasant words was 37.92, for unpleasant, 23.55. The more ready recall of the

pleasant was corroborated by the second group whose mean recall for pleasant words was 37.69, for unpleasant, 15.47.

In a word/word paired associates task, Cason (1932) had each of 26 subjects classify a few hundred pre-selected words as either P, U, or I. On the basis of these individual classifications, the experimenter constructed for each subject 20 P-P, 20 I-I, and 20 U-U pairs of words. Four five-pair lists were assembled in each category, and subjects were allowed three to five minutes to study each list. The average number of responses correctly recalled upon presentation of stimuli in a test following learning was P = 5.5, I = 4.6, and U = 4.2 out of 20 in each category. The difference between the P and U words reached significance.

A second study in the same series by Cason (1932) was identical to the first except that an attempt was made to render the classification system more sensitive by having the subjects categorize words according to a five-point scale: "Quite P, Slightly P, I, and Quite U." The 50 subjects learned three lists, each of which consisted of five pairs from each of the five categories. The number of correct responses in the "Quite P" category was significantly higher than that in any other category.

As the results of these two studies were somewhat questionable to the experimenter due to the fact that exposure time had not been standardized (allowing for the possibility that subjects could devote more time to learning P pairs rather than pairs in other categories), a third study in this series conducted by Cason and Lungren (1932) controlled for this factor. The stimulus material was also equated for grammatical comparability, length, serial position, and frequency of usage. Three lists of 24 pairs of words were constructed, the words having been

selected from the same pool of stimulus material used in the previous experiments. All three lists contained four each of the following pairs: P-U, U-P, P-I, U-I, and I-U. They were presented to the 50 subjects twice orally with an interval of five seconds between pairs. Learning was by the anticipation method. The subjects' retention of the pairs was tested immediately after mastery, and then again after an interval of one, two, and three days. None of the differences between any of the six classifications was significant. The fact that the subjects used in this study did not pre-rate their learnable material as well as the fact that the affective tone of the stimuli was confounded with that of the responses do not allow any definite conclusions to be drawn from this study.

Bunch and Wientge (1933) conducted a study to determine the relative susceptibility of pleasant, unpleasant, and indifferent learning material to retroactive inhibition resulting from the mastery of indifferent material during the interval before retention. Each of 143 college students was asked to rate 100 pre-selected words as P, U, or I. The subject's reaction to each word was also measured by a Hathaway galvanometer. Individual lists were prepared for each of the 125 subjects participating in the final study based on his/her ratings of, and physiological reaction to, the 100 words. The students were then divided into six groups, three of which served as control groups and three as experimental groups. All the subjects in each of the three control groups learned individual 15-item lists of all P, all U, or all I words, respectively. The same procedure was followed for the experimental groups. The material was learned by the anticipation method, and words were presented at a two-second exposure rate. After mastery of the material, all six groups were told to return in 48 hours. Upon their return, the

subjects in the three control groups re-learned the original material, after which they were immediately tested for recall. The subjects in the three experimental groups were first asked to learn additional 15-item lists (constructed in the same manner as the original lists) of all P, all U, or all I words, depending upon their group membership. After mastery of this material, the three experimental groups were asked to re-learn the original material, and were tested for recall immediately afterward. Results for the original learning trials showed a P-I-U sequence in terms of greater recall facility. Results for the control groups after an elapsed interval of 48 hours indicated that P words were, again, significantly better remembered than the U words, and only slightly better remembered than the I words (PIU). Results for the final learning trials of the experimental groups, however, indicated a P-U-I sequence. That is, the amount of retroactive inhibition was greatest for indifferent material, next for unpleasant and pleasant in the order named.

In a later study by Silverman and Cason (1934) a free recall format was used. Seventy-three subjects were asked to classify 117 pre-selected words as either "P," "U," or "I." A few minutes after the completion of the task, they were unexpectedly asked to recall as many of these words as they could. The rank order of the number of recalled words in the three categories was: P, U, I.

In another free recall task, Stagner (1933) had 200 college students classify 30 words as either P, U, or I. These words were identical to those used by Smith (1920) in his galvanometric experiment. The subjects then memorized the words for 2.5 minutes from the same list on which they had marked their classifications. The percentages of P, I, and U words recalled immediately after learning were: 75.20, 73.23, and

65.30, respectively. This study also revealed other important data. When the words were ranked according to the number of people recalling each (memory value) and then correlated with a pleasantness index based on the number of people who classified a particular word as P minus the number of people who classified it as U, the correlation was +0.375. The rank correlation between memory value of a word and its frequency, as determined by the Thorndike Word Book (Thorndike & Lorge, 1944), was +0.161. The correlation between galvanometric deflection (GD) caused by oral presentation and the memory value of the word yielded a +0.193, indicating a slight tendency for words having a high GD to be better remembered. A rank correlation of -0.224 between the memory value of a word and its length indicated that the shorter words were best remembered. Stagner also controlled for primacy and recency by having each of the 30 words used in the study occupy every position in the lists an equal number of times. The traditional values of primary and recency in determining memory value were confirmed, and the superiority of primacy over recency was clearly indicated.

Interest in the area of affective influence on 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, 1979; Postman, Bruner & McGinnies, 1948) which suggested that the perception of external stimuli is influenced by attitude, values, expectancies, needs, and psychological defenses.

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 conducted by Rychlak which were focused on the relationship between a subject's self-

evaluation and learning style (see Rychlak, Carlsen & Dunning, 1974; and Rychlak, Tasto, Andrews & Ellis, 1973). 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 subjects' 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 tachistoscope 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 category than to any other value category. An analysis of variance indicated that value preference was the only significant source of variance; word 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 the 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 or polarization of such assessments are independent of his familiarity or extent of contact with a given term, or the number of associations he can produce to an affectively-toned word. These experiments were widely varied in format and represented a departure from the more traditional paired-associates 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, high positive correlations were obtained between word or trigram "goodness" and the other two measures of meaningfulness. High positive correlations were also found in situations in which subjects were asked to recall names and then rate them for these same variables. 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 or m at significantly lower visual duration thresholds than bad, infrequent, or low AV words. The results of these studies also yielded high positive correlations between goodness and the other three variables. In another study, however, in which frequency, m, and goodness were manipulated, words high in goodness and m 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 was exposed to the stimuli achieved mixed results. Subjects in some studies found the more familiar stimulus to be the better one, while subjects in other studies reversed this trend. In rating experiments examining the relationship between polarization and frequency or m, it was found that polarization was highly correlated with m but not with frequency as determined by the Thorndike and Lorge (1944) tables. Finally, in another rating study, 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. A more detailed presentation of these experiments is presented below.

Cromwell (1956) conducted a study in which 137 college students in five groups were given a first name and then asked to recall eight living acquaintances who had this name. Each group was given a different first name. The subjects were then asked to rank the recalled names as to: (a) how well they liked that person, (b) how frequently they had had contact with that person, (c) how recently they had had contact with him/her, and (d) how well they knew him/her. In order to compensate for ranking habits, the order of the ranking tasks was systematically varied from group to group. These four tasks yielded rankings referred to as the "pleasure," "frequency," "recency," and "acquaintance" variables, respectively. Rankings on the four tasks were highly correlated with the order in which the names had been recalled. The correlation between pleasure and recall was 0.91; between frequency and recall, 0.96; between recency and recall, 0.94; and between acquaintance and recall, 0.90.

Johnson, Thomson, and Frincke (1960) conducted a series of experiments in order to ascertain how word values and word frequency were related to visual duration thresholds. The first experiment, in which three groups of subjects were asked to rate a randomly-sampled selection of words from the Thorndike and Lorge (1944) tables on the good-bad dimension of the semantic differential, yielded positive and significant correlations of +0.63, +0.40, and +0.38 between word frequency and word goodness.

In the second experiment of this series the investigators compiled a list comprised of 30 frequent and 30 infrequent words used by other researchers (Solomon & Howes, 1951) in a study of word frequency and visual duration threshold. The words were paired so that each frequent

word was presented with an infrequent word. Position of presentation within pairs was determined by coin flip. These 30 pairs of words were presented to 34 college freshmen who were told to encircle the most pleasantly-toned word of each pair. In 26 of the 30 word pairs, the more frequent word was chosen by the majority of the subjects as the most pleasantly toned. A sign test indicated that this preference for the more frequent word in each pair was significant to the 0.01 level.

In the third experiment of the series 22 college students rated two separate 24-item lists of nonsense syllables for goodness, as measured by the semantic differential. The nonsense syllables used were drawn from different association values (100%, 47 to 53%, and 0%) of the Glaze (1928) tables. Each list comprised eight nonsense syllables from each of the three association classifications and the order of the syllables was randomized. Results indicated that the nonsense syllables with higher association values were rated better on the semantic differential than those with lower association values. These differences were significant to the 0.01 and 0.05 levels.

Subsequent to this study, the same investigators had 14 subjects rate 20 nonsense words obtained from a study conducted by Solomon and Postman (1952) on the good-bad dimension of the semantic differential. After the rating, under the guise of a pronunciability task, each subject was exposed to the 20 words again, five words being presented ten times apiece; the next five, five times apiece; the next five, two times apiece; and the last five, once each. The cards on which the words were printed were shuffled thoroughly after each subject completed the task, so that they were in a relatively random order. Every subject rated the nonsense words again a second time following the pronunciability test.

Results indicated that a manipulation of the frequency of nonsense words produced systematic variation in their rated goodness. The more frequently presented words were rated as significantly better than those less frequently presented.

These results were confirmed by Zajonc (1968) who found, in a series of four studies, that mere repeated exposure of an individual to a stimulus object, such as words, nonsense syllables, and symbols, enhanced his/her attitude toward it.

Cantor (1968), however, using a format similar to those of Zajonc (1968) and Johnson et al. (1960), failed to corroborate these findings. In an experiment designed to determine the relationship between affective meaning and familiarity of non-verbal stimuli, Cantor had 52 fifth and sixth grade children view 20 black and white figures taken from the Welsh Figure Preference Test (Welsh, 1959). These figures were divided into two sets. Each set of pictures served as familiarization stimuli for one of two experimental groups. The figures were ordered on a film in seven blocks of ten frames each. A given figure occurred once within each block and a different random order of the ten figures occurred within each of the seven blocks. The set of figures not used as familiarization stimuli on each occasion served as the control set of stimuli. After the familiarization process, each subject was individually shown all 20 stimuli and told to rate them on a five-point scale of: "like very much," "like," "neutral," "dislike," and "dislike very much." It was found that the overall mean rating given the non-familiarized stimuli was significantly more favorable than that given the familiarized stimuli.

In the fifth and last experiment of the series conducted by Johnson, Thomson, and Frincke (1960), 49 subjects were asked to rate words of different frequencies obtained from the Thorndike and Lorge (1944) tables along the good-bad dimension of the semantic differential. These subjects were then tachistoscopically presented lists of these same words matched in frequency, varying in goodness, and matched in goodness, varying in frequency. The words were presented in random order and each word was exposed once at each of five speeds. It was found that the subjects reported the good words at significantly lower thresholds than the matched bad words; the frequent words at significantly lower thresholds than matched infrequent words. It was therefore determined that word value and frequency are significantly related.

Johnson, Frincke, and Martin (1961) subsequently conducted two follow-up studies in which a third variable was introduced--that of meaningfulness as determined by Noble's m (Noble, 1952a). M values were determined by asking 23 college students to write down as many associations as they could think of to each of 34 pre-selected words. Following Noble's (1952a) procedure, 60 seconds were allotted for each word. These words, taken from an earlier study (Johnson et al., 1960) were already matched in frequency and goodness. The identical procedure was repeated with another sample of 79 college students. A Mann-Whitney summed ranks test revealed that each of these two groups of subjects produced significantly higher m values for good than for bad words.

In the second study, using the m values produced by the two groups in the first experiment, lists of words varying in m, matched in frequency; varying in goodness, matched in m and frequency; and matched in frequency, varying in m, were constructed and tachistoscopically presented

to 17 students in a visual duration threshold (VDT) task. It was found that 14 of the 17 subjects had lower mean VDT's for high than for low m words matched in frequency. A sign test revealed this difference to be significant at the 0.05 level. Sixteen of the 17 subjects also had lower mean thresholds for good than for bad words matched in m and in frequency, a difference found to be significant to the 0.01 level. Twelve of the 17 subjects had lower mean thresholds for frequent than for infrequent words matched in m, but this difference did not reach significance. The experimenters concluded that word goodness was clearly related, m possibly related, and frequency essentially unrelated to VDT.

In a study designed to investigate the influence of "emotionality" and frequency of usage on the relationship between two measures of meaningfulness as determined by Noble's (1952) m and Jenkins' (1960) semantic differential polarization, Koen (1962) had five independent judges categorize a list of 100 words (obtained from sources such as Kent & Rosanoff, 1910; Noble, 1952; and Jenkins, Russell & Suci, 1958) on a 10-point scale according to their "emotionality" (i.e., "least emotional" to "most emotional"). Subsequently, the same judges rated the 100 words on a seven-step "good-bad" scale. From these 100 words the 30 with the most neutral ratings and the 30 with the most emotional ratings were chosen for use as experimental stimuli. This final list of 60 words also incorporated five words representative of Noble's (1952) entire m range and nine words which represented the whole polarization range of the semantic atlas (Jenkins, 1960). These 60 words were then randomly assigned to two lists, with 15 emotional and 15 neutral words in each. Forty subjects rated one list of 30 words on the three dimensions of the semantic differential (i.e., evaluation, potency, and activity) and responded

to the other 30 words using Noble's (1952) association procedure. Usage frequency of the stimulus words was obtained from Thorndike and Lorge (1944).

It was anticipated by Koen that m values would not be affected by the variable of emotionality in the words, and that both neutral and emotional words would exhibit significant correlations between m and usage frequency. The obtained correlations of 0.62 and 0.49 for neutral and emotional words, respectively, supported this hypothesis. It was also expected that there would be a significant correlation between usage frequency and polarization for neutral but not for emotional words. These correlations were found to be 0.51 and -0.21, respectively, supporting this hypothesis. It was found, later, however, that polarization and frequency were related principally through m (or production value). This was demonstrated by the fact that, when m was partialed out of the correlation between frequency and polarization, the 0.51 figure was reduced to 0.21 (not significant). Partialing frequency out of the m-polarization correlation, however, resulted only in a reduction from 0.61 to 0.46--still significant at the 0.01 level. A significant correlation was also anticipated between m and polarization for neutral but not for emotional words. This hypothesis was supported by correlations of 0.61 and 0.02, respectively. It was concluded by the author that emotionality produced no important differences in m ratings, while polarization was quite influenced by this factor. It was also concluded that frequency of usage is related to polarization indirectly through its correlation with m.

Sarbin and Quenk (1964) conducted another study on the relationship between association value and polarization, this time using non-

referential, CVC nonsense syllables. Forty-seven subjects rated 10 nonsense syllables on 20 scales of the semantic differential (Jenkins, Russell & Suci, 1958). These nonsense syllables had been compiled from the less than 10 percent and more than 90 percent ranges of association values found in the Glaze (1928) and Witmer (1935) norms. Results indicated that association value and polarization were unrelated variables.

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, 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 individual subjective assessments.

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

Keppel (1963) reported two paired-associates experiments, the first of which was designed to test the relative effectiveness of goodness (G) and association value (AV) as predictors of the ease of learning nonsense syllables, and the second of which was focused on the relationship between goodness and the rate of learning words. In the first experiment 44 subjects rated 48 nonsense syllables on the good-bad dimension of the semantic differential. These syllables had been drawn from three association value ranges (0%, 47 to 53%, and 100%) of the Glaze (1928) tables. Two lists of six syllables each were prepared. For list one, three pairs of syllables were chosen, one pair at each of the three levels of association value, but with goodness varying as widely as possible between the members of each pair. For list two, three pairs of syllables were selected such that the members of each pair were matched in G but varying in levels of AV. The stimuli, the numbers one through six, were assigned at random to the six syllables of each list. The number-syllable pairs were presented in different order to ten subjects who received 12 anticipation trials on each list, one-half of the subjects being given list one first, and one-half, list two first. The mean number of correct responses for each syllable over the 12 learning trials was tabulated and it was found that the "good" syllables were learned faster than the "bad" syllables, and that this difference was significant to the 0.01 level. Similarly, syllables high in AV were learned considerably more readily than those low in AV, a difference found to be significant to the 0.001 level. The correlation between these two variables was also determined to be significant. However, in a follow-up rating study conducted to determine the relationship between pronunciability, goodness, and association value, pronunciability was partialed

out of the G-AV correlation and the obtained r's did not reach significance. This result prompted the conclusion that, for nonsense syllables, the relationship between G and AV was due largely to the uncontrolled variation in pronunciability.

In experiment two, seven pairs of words (used by Johnson et al., 1961) matched in frequency and meaningfulness (m) and varying in G comprised the learning material. The numbers 1 to 14 served as stimuli and the 14 words as responses. Three lists of number-word combinations were formed by three random assignments of numbers to words. These lists were presented to 36 college students who learned them via the anticipation method. Results yielded no significant differences in the rate of learning between the good and bad words.

A series of four free-recall, one serial learning, and 12 paired-associates experiments was conducted by Anisfeld and Lambert (1966) to determine in what types of learning tasks and under what conditions pleasant words were learned more quickly than unpleasant ones. The 24 words used in all these studies were classified as pleasant (P) or unpleasant (U) on the basis of their position on the evaluative scales of the semantic differential. The evaluative ratings of some words were taken from Jenkins' (1960) atlas and others from a prior study conducted by one of the experimenters. Both P and U words were matched in frequency (Thorndike & Lorge, 1944) and in production value or m. The m values were also obtained from a prior study by means of Noble's (1952) procedures. The subjects used in the experiments were Harvard and McGill University students as well as high school students drawn from various areas. A Kodak Carousel slide projector was the standard exposure apparatus used in all group experiments. The exposure time for each item was 3.8

seconds and the inter-item interval was 0.7 seconds. Standard memory drums were employed in experiments using individual testing. Care was taken to control for variables such as serial position, order of presentation, and intralist similarity.

The four free-recall studies fell into one of the following categories: (1) intentional learning--equal exposure time per item; (2) intentional learning--exposure time per item uncontrolled; and (3) incidental learning--equal exposure time per item. It was anticipated that there would be no difference in the rate of recall for P and U words. This hypothesis was supported.

In the serial learning experiment items recalled were analyzed for order and position. To obtain order scores, the P words in their correct order--i.e., following the correct word--and the U words in their correct order were counted. Position scores consisted of the number of words in their correct position in the list. Results indicated that P and U words did not differ significantly in either order or position.

In the 12 paired-associates studies, four types of items were paired with the P and U words: other P and U words, indifferent or neutral words, numbers and nonsense syllables. The additional P and U words, as well as the indifferent ones, were taken from the Jenkins' (1960) atlas. The numbers used were equated for their association value using the Battig and Spera (1962) tables. The nonsense syllables were selected from the 56 to 61 percent association value range of the Archer (1960) norms.

The format of these experiments was also varied with respect to: (1) the position of the P and U words within a pair, (2) the methods of testing (anticipation versus recall of both members of a pair or the

matching of a pair, given both members), (3) stimulus exposure times, (4) presentation by a projector versus a memory drum, (5) the number of learning trials, and (6) verbal versus written responses. Any apparent association between members of a pair or between items in a list was carefully avoided. The order of items in a pair, as well as the order of list presentation was varied. Intentional learning instructions were given in all 12 experiments.

The results yielded by these 12 studies indicated that P words were learned more quickly than U words only when the affectively-toned words were paired with nonsense syllables, and only when the nonsense syllables were in the A position of a pair and the P and U words were in the B position.

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, and number-word 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. Weaknesses in the studies conducted by Keppel (1933) and Anisfeld and Lambert (1966) which may have differentiated their findings from those of their earlier counterparts (many of whom controlled for such weaknesses) are: rating unreliability, learning materials which reflected pooled rather than

individual assessments of affective tone, and the use of frequency and association values from standard, independent sources.

Rychlak and Reinforcement Value

In an article published in the mid-sixties, Rychlak introduced the concept of "affectual meaningfulness" as a psychological assessment made by a subject of the material he/she is asked to learn in an experimental situation (Rychlak, 1966). According to Rychlak, these assessments (i.e., good-bad, pleasant-unpleasant, liked-disliked) are unique, arbitrary, and dichotomous (Rychlak, 1977). They are unique in that they represent a subjective, individual judgment. They are arbitrary because they are determined not by the quality of the environmental stimulus to which they are assigned, but rather by an individual's spontaneous evaluation of that stimulus. Often this assessment is made on the basis of a positive or negative emotional reaction, but such a reaction is not a necessary factor in the generation of an evaluative judgment. They are dichotomous because they are essentially qualitative (as opposed to quantitative), either-or assessments.

Rychlak's definition of meaningfulness has important methodological implications. First, unlike other measures of meaningfulness (such as association value, Noble's m and e, Osgood's E, P, and A, and Jenkins' polarization formula) reinforcement value is distinctive in that it represents an individual evaluation rather than a group consensus. Additionally, such individual assessments are used as the source from which a subject's learnable material is selected. This means that, in an experimental situation, a person is tested on items, the affective value of which he/she alone has determined. While this system of material

selection was used by some earlier researchers (Bunch & Wientge, 1933; Cason, 1932; Cromwell, 1956; Thomson, 1930) Rychlak is notable for the consistency with which he employs this method in his studies. Second, reinforcement value is operationally defined by having a subject rate learnable materials according to a scale of "like much (LM), like slightly (LS), dislike slightly (DS), and dislike much (DM)" (Rychlak, 1966). This four-step scale, with no neutral option, is consistent with Rychlak's definition of meaningfulness as dichotomous.

Other notable features which distinguish Rychlak's methodology from that of other researchers include the use of the "Phonetic Preference Inventory" (see Appendix A) to control for association value (AV), and the practice of obtaining reliable subject ratings of learnable material. In the typical experiment designed to test for the influence of reinforcement value on learning, a subject pre-rates a list of 140 consonant-vowel-consonant nonsense syllables or trigrams entitled the "Phonetic Preference Inventory" (Rychlak, 1966). The trigrams used in the inventory were selected from the 44 to 78 percentile range of association value as determined by Archer (1960). Thirty-five trigrams were chosen from the 40th decile, 34 from the 50th decile, 36 from the 60th decile, and 35 from the 70th decile of AV. The scale is numbered consecutively from 1 to 140 so that items low in AV (i.e., 44%) appear at the beginning of the list, and items high in AV appear at the end. There are slight marks on the form to indicate where a series of trigrams changes from one AV decile to another. This numbering system is important because it affords the experimenter an effective and easy way to control for AV. For example, in selecting trigrams for a study, the experimenter knows that if he selects trigrams from a given decile--especially

from a four- to five-point range within that decile--he is selecting trigrams which do not vary more than a few percentage points in AV. In this manner the AV of trigrams can be controlled while reinforcement value (RV) is systematically varied in item selection. 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. 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).

Several of Rychlak's early experiments were similar to those produced by his contemporaries in the field (i.e., Anisfeld & Lambert, 1966; Keppel, 1963; Koen, 1962; Johnson, Frincke & Martin, 1961; Johnson, Thomson & Frincke, 1960; and Sarbin & Quenk, 1964) in that the focus of such studies was on determining the influence of affective (or reinforcement) value on learning and proving its independence from other measures of meaningfulness. In one study (Abramson, Tasto & Rychlak, 1969) the experimenters sought to demonstrate that both AV and RV facilitated paired-associates learning of CVC trigrams without any statistical interaction. Four-hundred and fifty trigrams were randomly selected from the low (10 to 20%), medium (45 to 55%), and high (80 to 90%) AV levels of Archer's (1960) norms. These trigrams were submitted to 132 college students who rated them for RV on two occasions, one week apart. The RV trigram ratings were then recorded on IBM cards along with subjects' names, sex, and ages for matching purposes. Ten lists of eight paired associates each were constructed for the three levels of AV so that a subject within any level was matched with two other subjects for list, class level,

and age. One of these subjects would have rated the eight pairs of trigrams as "liked," one as "disliked," and the third as "ambivalent." The trigrams were mounted both individually and in pairs on plastic photographic slides and presented to the subjects via a Carousel slide projector set at a 2:2-sec exposure rate. Three different orders were arranged for each list to counteract serial learning effects. Subjects then learned their trigram pairs via the method of anticipation. The experimental criterion of learning was two successive trials of correct anticipations for the entire list. Results indicated a significant effect for AV on the trials to criterion; the high (80 to 90%) AV trigrams were easier to learn than the low (10 to 20%) AV trigrams, but neither of these extremes differed significantly from the medium (45 to 55%) AV trigrams. Within all three levels of AV, however, a significant difference for RV was obtained; that is, RV and AV did not interact in the statistical test. Simple effects tests indicated that liked trigrams were learned more easily than disliked trigrams.

These results were confirmed in a follow-up study (Abramson, Tasto & Rychlak, 1969) in which trigrams from an extremely narrow range (45 to 55%) of AV were selected from the Archer (1960) norms and presented to 20 subjects who individually rated them for both AV and RV. Archer's (1960) instructions were followed and subjects were asked to rate each trigram on the basis of the following questions: "Does it sound like a word? Does it remind me of a word? Can I use it in a sentence?" The subjects were instructed to mark the rating sheet in the "yes" column if they could answer any of these questions affirmatively, and in the "no" column if they could not. After the completion of the AV rating procedure, subjects were asked to rate the trigrams for RV in the usual

fashion. Individual lists of 12 paired associates were constructed, three of which fell into each of the following four categories: yes-AV, like-RV; no-AV, like-RV; yes-AV, dislike-RV; and no-AV, dislike-RV. Findings indicated that both high AV and positive RV were significant in their influence on the rate of learning, and that there was no significant statistical interaction between these two factors.

Although the results of these studies indicated that RV and AV did not interact statistically, they did demonstrate that increasing levels of AV, as well as positive RV, led to a more rapid acquisition of CVC trigrams. Faced with the possibility that RV could be just another form of AV, Rychlak conducted several other experiments to test for this proposition.

In the first study (Rychlak, 1966), 30 college students (15 males and 15 females) rated the trigrams contained in the Phonetic Preference Inventory (PPI) for RV. Ten liked, ten disliked, and ten ambivalently-rated trigrams were selected for each subject's protocol and individually presented to him/her. Subjects were then asked to judge the "word quality" of their lists of trigrams using the typical Archer (1960) procedures. Each subject's trigrams were mounted on slides and presented via a slide projector. The slides were thoroughly shuffled and exposed for four seconds each, followed by a four-second interval during which the subject recorded his/her responses. Since 30 subjects rated 30 trigrams apiece, there were 900 possible opportunities for subjects to judge a trigram as "wordlike," 300 in each of the RV classifications. Results indicated that 169 liked, 128 disliked, and 135 ambivalently-rated trigrams were affirmed as wordlike, but these differences proved insignificant when tested via the Friedman two-way ANOVA by ranks.

In the next experiment (Tenbrunsel, Nishball & Rychlak, 1968), 100 college students (45 females and 55 males) rated the nonsense syllables appearing in the PPI for both AV and RV on two occasions, with one week intervening. Presentation procedures were identical to those used in the previous study, except that two of the four experimental groups received AV rating instructions first, and the other two groups received RV rating instructions first. It was found that only 35 of the 140 CVC trigrams were significantly related in terms of word quality and positive affective value. Furthermore, this confounding of trigram ratings occcurred significantly more frequently at the 44 to 50 percentile level of AV rather than at the 64 to 70 percentile level. This finding was unexpected as it was anticipated that if AV and RV were identical measures, items at the highest level of cultural meaninfulness as determined by AV should also produce significantly more RV positive ratings. Although they used standard AV tables to select experimental items, this was precisely what Johnson, Thomson, and Frincke (1960) had found in their study of affective value and AV.

The second experiment in the same series (Tenbrunsel, Nishball & Rychlak, 1968) was designed to replicate this unexpected finding and it was hypothesized that a confounding of AV and RV ratings would take place at the lowest levels of AV. One hundred college students (29 females and 71 males) were asked to rate 10 trigrams from each of the deciles of the Archer (1960) norms. Subjects rated these 100 trigrams for both AV and RV on two occasions, a week apart. Results indicated that trigrams from the 0 to 50 percent levels of AV correlated 0.73 with RV, while items from the 51 to 100 percent level of AV correlated only 0.57. This difference in correlation values was significant to the 0.05 level.

In order to determine whether it could be stated that positive RV was negatively correlated with increasing levels of AV, and thereby refute the notion that RV and AV were identical measures of meaningfulness, Rychlak and his colleagues (Tuan, 1974) asked 86 college subjects (51 males and 35 females) to rate 20 trigrams at each of the steps from 1 to 5 percent, 6 to 10 percent, and so forth, up to the 96 to 100 percent AV levels of Archer's (1960) norms (400 trigrams in all). Subjects were instructed to make both AV and RV judgments at the same time, thereby placing a trigram in one of four categories: yes-like, yes-dislike, no-like, and no-dislike. The experimental hypothesis held that yes-dislike trigrams would be positively correlated with the Archer level, and no-like trigrams would be negatively correlated with increasing levels of AV. Pearsonian correlations of 0.70 for the yes-dislike category of trigrams and -0.17 for the no-like category support this hypothesis. Because the findings of this and the previous three studies did not support the prevailing notion that the higher the AV, the "better" the syllable, Rychlak concluded that, although confounded in certain experimental situations, AV and RV were essentially different measures of meaningfulness.

Although the results of these studies appeared to distinguish between RV and AV, they did not rule out the possibility that another type of frequency measure, such as Noble's m, could be responsible for the apaparent influence of RV on learning. The implication was that even though a subject liked a trigram which was low in AV, he could simply have more personal associations to liked rather than disliked items. To test for this idea, Rychlak and his associations (Kubat, 1969) asked 27 high school students (13 males and 14 females) to rate trigrams from three levels of the Archer (1960) norms (10 to 20% AV, 45 to 55% AV, and

80 to 90% AV) for RV. An electronic computer was used to match groups of nine subjects on the same five trigrams at each of these three levels of AV. Three of these nine subjects had rated the five trigrams as liked, three as disliked, and three as ambivalent. Noble's (1952) procedure was then employed, in which subjects were asked to associate to each of the five trigrams for two minutes per trigram. A score was then derived for each subject reflecting the mean number of word associates he/she proffered to his/her five trigrams. Results demonstrated that subjects did not associate more words to liked rather than disliked or ambivalently-rated trigrams over the two-minute interval, thus refuting the null hypothesis that a subject had more personal associates to liked rather than disliked items. These results were replicated in a second study (Kubat, 1969).

The findings of these two experiments were in direct contrast to those yielded by Johnson, Frincke, and Martin (1961) who used words in their studies of the relationship between Noble's m and affective value. The fact that Rychlak had his subjects rate the experimental items for both RV and m, rather than just m as was done in the Johnson et al. study, is seen as the major source of this discrepancy.

A final strategy used in an effort to test the independence of AV and RV in terms of their influence on the learning of CVC trigrams was that of factor analysis. In the first of two studies devoted to this effort (Flynn, 1967), 44 college students (26 females and 18 males) were asked to rate 100 trigrams chosen randomly from the 20 to 90 percentile range of Archer's (1960) norms. A subject was asked to make seven either-or ratings, three of which were hypothesized to load on a common AV factor, three of which were hypothesized to load on a common RV factor, and

the last of which was included without prediction as to what factor it would load on. It was also hypothesized that RV and Osgood's (1955) evaluation meaning dimension would load on a common factor. The hypothesized AV instructions were: (1) "Does this trigram look like a word, remind me of a word, or can I use it in a sentence?" (2) "Is this trigram easy for me to pronounce or is it hard for me to pronounce?" and (3) "If I had to learn a list of such trigrams, would this particular one be easy for me to learn or would it be a hard one to learn?" The hypothesized RV instructions were: (1) "Do I like the sound of this trigram or do I dislike it?" (2) "Does this trigram strike me as being good, or as being bad?" and (3) "Does this trigram strike me as being happy, or sad?" The bi-polar adjectives "good/bad" and "happy/sad" were cited by Snider and Osgood (1969) as reliable measures of the evaluative factor. The order of these six instructions was counterbalanced, and the 100 trigrams were randomly reordered before being presented to the same subjects over the six experimental days. Trigrams were projected onto a screen before the group, and each was exposed for two seconds with a two-second delay between presentations. On the sixth experimental day the 100 trigrams were presented twice. On the second occasion subjects were given the following rating instruction: "Is this trigram meaningful to me? Does it have meaning for me, or does it lack meaning for me?" The ratings were then analyzed and two factors were extracted which accounted for 34 percent of the total variance. Except for pronunciability, the RV and AV instructions loaded on separate factors. There was also evidence that both RV and E loaded on a common factor. Finally, although meaningfulness was related to both of the factors extracted, it loaded more heavily on the RV than on the AV factor (0.38 versus 0.20).

The second factor analysis (Flynn, 1969) focused more specifically on the relationship between RV and Osgood's theory of meaningfulness for it included all three of his dimensions: evaluation, potency, and activity. Forty-three college students (24 females and 19 males) were asked to rate 25 trigrams, five paralogs (e.g., gojey, sagrole, bodkin, etc., from Noble, 1952), and 20 words randomly selected from the Thorndike and Lorge (1944) lists. As in the first factor analysis, three instructions were devised which were expected to load on an AV dimension: (1) trigram frequency--"Does this trigram remind me of a word?" Word frequency--"How often do I use this word?" (2) Trigram and word learnability--"If I had to learn a list of (trigrams/words), would this particular one be easy or hard?" (3) Trigram and word familiarity--"Is this particular (word/trigram) familiar or is it unfamiliar to me?" Subjects were also asked to rate the trigrams/words on all three of Osgood's dimensions: (1) evaluation--"Does this (trigram/word) strike me as being good or as being bad?" (2) Potency--"Does this (trigram/word) strike me as being strong or as being weak?" (3) Activity--"Does this (trigram/word) strike me as being active or as being passive?" Once again, the bi-polar adjectives selected were based on recommendations taken from Snider and Osgood (1969). The usual RV instruction was also employed: "Do I like this (trigram/word), or do I dislike it?" It was predicted that of Osgood's three dimensions, only E would load on a factor in common with RV and that AV would load on a different factor than either RV or E. Once again, the instructions and order of the verbal material were randomized across administrations. Words and trigrams were flashed on a screen for three seconds, and a three-second delay between flashes permitted the students to make their ratings. Subjects were tested over a two-week

period, with 48 to 72 hours intervening between the various instructions. Three factors were extracted from this study. Factor I was positively loaded (4.62) by a frequency or AV instruction and negatively loaded by RV, potency, and activity. E loaded minimally (0.28) on this factor. Factor II was positively loaded by both RV (3.67) and E (3.13) and negatively loaded by frequency (-1.03), familiarity (-1.74), potency (-0.99), and activity (-2.45). Factor III was positively loaded by the first AV instruction (wordlike/unwordlike) and negatively loaded by all of the rest of the instructions.

Subsequent to these studies, which were focused primarily on the relationship of reinforcement value to other measures of meaningfulness, Rychlak and his colleagues continued to investigate the effect of RV on learning. This research corroborated his own initial findings and those 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 the "RV-positive effect." It appeared not only in the Abramson, Tasto, and Ellis (1969) studies (already reviewed) as well as several similar experiments using CVC trigrams as learnable materials (Laberteaux, 1968; O'Leary, 1968; Rychlak, 1966; 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 operate in normal (non-psychotic)

populations, a diminution or reversal of this effect was found in abnormal (schizophrenic) populations. For instance, in a study conducted by Rychlak, McKee, Schneider, and Abramson (1971), 20 psychotic in-patients (10 males and 10 females) and 20 psychiatric aides were matched for sex, age, educational level, social class and intelligence. Roughly 85 percent of the in-patients had been diagnosed as chronic schizophrenics. All psychotics were taken off drugs for the three days preceding their participation in the learning experiment. Both groups of subjects were presented with 200 CVC trigrams taken from the 70 to 80 percent levels of the Archer (1960) norms and asked to rate them for both association and reinforcement values. On the basis of these ratings, four lists of six trigram pairs apiece were constructed for all subjects, each list of which corresponded to one of the following categories: AV yes, RV liked; AV yes, RV disliked; AV no, RV liked; and AV no, RV disliked. Intralist procedures were followed to minimize the effects of pronunciability, rhyming, and alliteration. The lists were printed on three separate memory drum papers in a randomized order to offset the possibility of serial learning. The order of the four-list presentations was counterbalanced across subjects in the two groups. The subjects then participated in a paired-associates learning task using the method of anticipation. The criterion of learning was two consecutive correct anticipations for an entire list of six paired associates. As predicted, the non-psychotic subjects acquired the trigrams they had rated as liked significantly more quickly than those they had rated as disliked. The psychotic subjects, however, demonstrated a slight (statistically non-significant) tendency to learn the trigrams they had rated as negative in RV more readily than those they had rated as positive in RV. Separate

analyses conducted on the male and female subjects established that the psychotic males were responsible for this trend as they demonstrated a clear RV-positive reversal in their learning styles. There were no significant main effects for AV in this study, nor did this factor enter into any significant interaction.

A follow-up study (Rychlak, McKee, Schneider & Abramson, 1971) corroborated these findings and established that the schizophrenic subjects learned their disliked trigrams more readily than their liked trigrams and that this difference was significant at the 0.05 level.

Subsequent studies conducted by Rychlak and his colleagues demonstrated that the RV reversal effect appeared to be operative 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 percentile 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. The lists were checked for rhyming and alliteration, and were presented to each subject in three different orders so as to offset the possibility of serial learning. A free-recall task followed in which the subjects viewed their trigrams via a memory drum which had been set at a two-second exposure rate. 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 RV reached significance at the 0.01 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 RV 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.

The RV reversal effect demonstrated in these last four studies by both the psychotics and subjects with poor self-concepts was of interest to Rychlak for its potential utility in the identification, prognosis, and treatment of abnormality. 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).

The RV positive diminution or reversal effect occurred not only among abnormal populations and those subjects who judged themselves critically, but also among those who judged the learning task negatively. In a study conducted by Marceil (1975), 60 high school students (evenly divided by sex) were selected from a larger pool of 120 students who had been shown a memory-drum, paired-associates task in class as a demonstration. Students were asked to rate how much they would like to be a subject in such a study. Based on these ratings, subjects were identified as being positively or negatively disposed toward the memory-drum task, and were assigned to one of two experimental groups. The PPI was administered on two occasions, and a list of 12 paired associates was constructed for each subject, six pairs of which he/she had rated as liked and six pairs of which he/she had rated as disliked. The lists were presented via a memory drum and the method of anticipation was followed. The learning criterion was two consecutive correct anticipations of the entire list. The results indicated that those subjects who were positively disposed toward the task learned their liked trigrams more quickly than their disliked trigrams, but the subjects who were negatively disposed toward the task learned their disliked trigrams as readily as their liked trigrams.

In subsequent studies, Rychlak broadened the context in which the RV positive diminution or reversal effect could be expected to occur. He and his colleagues conducted several experiments in which subjects

were asked to rate themselves along a specific personality trait, say extraversion 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" extraverted 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 percentile 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. Precautions were taken in constructing recall lists to avoid intralist similarity. Presentation of the lists by a Carousel projector was timed at four seconds exposure per trigram, with a 45-second period between trials for the subject to record those trigrams he/she could recall having seen. List order was randomized between trials to mitigate the influence of serial position effects. 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 positive material significantly faster than their negative material. The females showed only a slight advantage for their positive trigrams.

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 and 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 percent rating consensus were retained. The 250 nouns so chosen fell into one or the other of the following designations: (1) 53 high frequency, ascendent 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 submissive personalities. These 40 subjects were asked to rate the 250 pre-chosen nouns for RV on two occasions, with 48 hours intervening. Paired-associates 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 words were mounted on slides and individually presented to subjects via a screen and projector set at a four-second cycle. Precautions were taken in list construction to eliminate letter-overlap and rhyming of words, and the pairs were shuffled between trials to negate the effect of serial learning. 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. These findings were reminiscent of the study (previously reviewed) conducted by Postman and Schneider (1951) in which subjects recalled more readily words which were related to their interest area. 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. The frequency dimension of meaningfulness fell short of significance, nor did it interact significantly with any other factor. These findings were opposite to those found by Johnson, Thomas, and Frincke (1960) in their study of the effect of word frequency and goodness on visual duration thresholds.

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 compentence for him/her, he/she would recall these words according to a positive reinforcement value effect (i.e., recall liked words more readily than disliked words). These effects, furthermore, 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 and 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 percent 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. The lists were equated for word length and no more than two words began with the same letter. Words were mounted on slides and projected onto a screen by a Carousel projector set at a five-second exposure rate. Free recall was tested by having a subject record in writing those words he/she had just seen flashed on the screen in any order that he/she could. 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 to the 0.05 level. The ego-strength and sex variables, however, failed to enter into any of the findings.

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). 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 positively (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, 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."

In the last few years, Rychlak has returned to his 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 a recently completed 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 administrated, 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 0.01 and 0.05 levels, respectively; however, subjects acquired their weak and slow trigrams more readily than their strong and fast trigrams, but this difference did not reach significance.

Statement of the Problem

According to Rychlak's logical learning theory, meaningfulness is defined as congruency between an individual's self-assessment and his/her evaluation of learnable materials. Those items which are meaningful to a subject are presumed to be easier to learn. In testing this hypothesis, Rychlak had subjects rate themselves on a specific personality dimension and then learn material which had been rated by others along the identical dimension. Using this methodology, Rychlak was able to provide

support for this theory (see Rychlak, Tasto, Andrews & Ellis, 1973; Rychlak, Carlsen & Dunning, 1974). In his last study, however, Rychlak departed from this format and had randomly-sampled groups of subjects rate and learn items which had not been determined to be personally meaningful. The results of this study revealed that positive affective assessment as determined by reinforcement value and Osgood's evaluative dimension of meaningfulness appeared to facilitate the recall of CVC trigrams while potency and activity did not. The discrepancy in these findings may be due to the fact that in a "normal" population there may be a preponderance of individuals who view themselves as "liked" or "good" and who would, therefore, find meaningful those items which they assessed to be positive in RV and E. Such a population, however, may not yield subjects who classify themselves as either strong/weak or active/passive, and who would, therefore, find materials evaluated along these dimensions as lacking meaning. Presumably, in such an experimental situation, neither potency nor activity would facilitate learning.

The present study was designed to expand on the work of Rychlak 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. In keeping with Rychlak's most recent experiment (Rychlak, Flynn & Burger, 1979), Osgood's three dimensions--evaluation (E), potency (P), and activity (A)--were used as the criteria by which subjects determined the meaningfulness of the material they were asked to learn. As the results of Rychlak's last study established that reinforcement value and evaluation were methodologically similar, RV was not used as a measure of meaningfulness in the present experiment.

The plan of Rychlak's 1979 study was followed by having subjects rate the 140 trigrams contained in the Phonetic Preference Inventory on two occasions for either E, P, or A, and then participate in a free recall task. In contrast to Rychlak's last experiment, however, the subject population employed in this study had characterized themselves on a pre-test instrument as being either "high" or "low" on these three dimensions. This change allowed comparisons to 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. In order to insure that differences in learning effects would not be due to variation in trigram pronunciability, familiarity, etc., trigrams were counterbalanced across subject lists.

The method of having a subject rate both herself and her learnable material is similar to the one used by Rychlak in his earlier personality-related studies (Rychlak, Carlsen & Dunning, 1974; Rychlak, Tasto, Andrews & Ellis, 1973) with one important difference. Whereas Rychlak had subjects rate themselves on a specified dimension and then learn items which had been rated by others on the identical dimension, this study had subjects judge both themselves and the material they were expected to recall via the same criteria. It was anticipated that this difference in rating procedure would ensure to a greater extent that subjects were learning material which they, personally, found meaningful or nonmeaningful.

This study also used a subject population comprised entirely of females as opposed to a mixed-sex group employed by Rychlak. This change was made to simplify the statistical analysis. Females rather than males

were chosen because the results of Rychlak's last study (Rychlak, Flynn & Burger, 1979) revealed that the females' learning style was most sensitive to differences in trigram ratings.

Hypothesis

1. 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 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 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 60 female 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 118 female students who were administered the Self Inventory Scale. The subjects were assigned to one of six experimental groups. Each group was composed of ten individuals. 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 on 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 her group membership. The mean age of subjects in each of the six groups was: Group I (LE)--18.7 years; Group II (HE)--18.9 years; Group III (LP) --19.1 years; Group IV (HP)--18.8 years; Group V (LA)--19.0 years; Group VI (HA)--18.8 years.

Materials and Apparatus

Self Inventory Scale

The Self Inventory Scale (Appendix B) uses the semantic differential technique to quantify self-evaluations. Fifteen, four-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 four spaces, a subject indicates how descriptive either adjective is of her. Above the scales were the headings "very, moderately, moderately, and very" 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). Each meaning factor was represented by five pairs of adjectives. Good/bad, beautiful/ugly, nice/awful, pleasant/unpleasant, and happy/sad were used to represent the evaluative (E) factor; hard/soft, thick/thin, strong/weak, sharp/dull, and large/small were used to represent the potency (P) factor; and hot/cold, active/passive, fast/slow, heavy/light, and excitable/calm were used to represent the activity (A) factor. A four-point, Likert-type rating scale with no neutral choice was used in keeping with Rychlak's (1977) procedures and belief that affective assessment is never neutral.

The rating forms were xeroxed on 21.6- by 27.9-cm sheets of paper. Each 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 third scale was labeled good to bad, while the fourth scale was labeled weak to strong. For scoring purposes, each semantic space represented a number from one to four with "1" representing the least positive or least intense meaning and "4" representing the most positive or most intense meaning. Each sheet contained directions for the rating procedure as well as labeled spaces for the recording of informational and demographic data.

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. Thirty-five 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," "slightly good," "slightly bad," or "very bad." Form P stated that the trigrams were to be rated on the basis of whether they sounded "very strong," "slightly strong," "slightly 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," "slightly active," "slightly 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 four-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 her. Above each of the four 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), SG (slightly good), SB (slightly bad), and VB (very bad). On Form P the headings were: VS (very strong), SS (slightly strong), SW (slightly weak), and VW (very weak). On Form A the headings were: VA (very active), SA (slightly active), SP (slightly passive), and VP (very passive). For scoring purposes, each space represented a number from one to four with "1" representing the least positive or intense meaning and "4" representing the most positive or intense meaning.

Each form of the inventory was xeroxed 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

An IBM 3081D computer and computer program written in SAS were used

to compile the 12-item trigram lists employed in the learning trials of this experiment. 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 congruent and incongruent learning condition so that differences in learning effects would not be due to variation in trigram pronunciability, 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., four or three) or "low" (i.e., two or one) on 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 trigram were compared. If the first individual had rated the trigram to reflect her self-assessment, the second subject would have to have rated it as opposite to her self-appraisal, or vice-versa. For example, if a subject in the low evaluative group had rated a trigram as consistent with her self-evaluation (i.e., as "bad"), then the second subject in either the low or high evaluative group would have to have rated it as inconsistent with her self-assessment (i.e., as "good" if she were in the low evaluative group or as "bad" if she were in the high

evaluative group). 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 be realized, that particular item was discarded, and a second trigram was randomly chosen from the first individual's pool and submitted to the same procedure. This process was continued until a list of 12 items was generated for each of 60 subjects, six of which she had individually rated as "high" and six of which she had rated as "low." Furthermore, each of the 12 trigrams appearing on a subject's list also appeared on the list of some other subject in the same or complimentary group, with the proviso that it appeared in both a congruent and incongruent condition. A trigram could appear on the lists of any number of subjects as long as it appeared an equal number of times under each learning 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. The inventories were then collected and scored by the experimenter. Those subjects with scores in the upper or lower tertile on either the evaluative, potency, or activity dimension of the scale were contacted by telephone and asked if they wished to participate in the experiment for extra credit in their introductory psychology class. A brief description of the experimental tasks and the approximate time

needed to complete them was given and an appointment was made for the first trigram rating session. If a subject indicated her willingness to participate in the study, she was assigned to one of six experimental groups based on her inventory score. If a subject scored in the upper or lower tertile on more than one of the three dimensions, a coin toss determined her group membership. Individuals with scores in the middle tertile on all three dimensions of the Self Inventory Scale were contacted, told that they would not be needed in the study, and thanked for their interest and initial participation in the experiment.

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 of the rating sessions which were scheduled continuously for four consecutive days. 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 form and were encouraged to ask any questions they might have about the rating procedure. When a subject indicated her readiness to begin, she commenced the task. As each subject finished the syllable rating task, an appointment was made for her second rating session.

Each subject's second rating session took place within two days from her first. After subjects completed two such administrations of the PII, their ratings were entered into the computer. Sixty 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 her arrival at the experiment, each subject was individually ushered into a small room equipped with a table and two chairs. She was told that she would be participating in a memory task and instructions (Appendix D) were read aloud to her by the experimenter. After the subject indicated 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 letters 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 E) on which she recorded as many trigrams as 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, she was thanked for her 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 variable 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 sub-list of six "high" rated and "low" rated trigrams was obtained by adding the trials scores for every trigram contained in each sub-list.

Because the trials score does not take into account all the 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 her two sub-lists by the total number of recall opportunities she had for either sub-list 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--six rated "high" and six rated "low" on any of the three meaning dimensions--it could be said that she had 72 chances for "hits" in each of the sub-lists (six trigrams X 12 trials). If the actual number of correct recalls for the "high" and "low" sub-lists is then divided by 72, the quotient is the percent-hits score. This ratio is usually highly correlated (0.70 or greater) with the trials score (Rychlak, 1977).

Addendum to the Methodology

The computer program originally intended to generate trigram lists for the learning trials phase of this study was found to be inaccurate after completion of the experiment. The errors detected had to do with the failure of the program to: (1) identify reliably-rated trigrams,

and (2) counterbalance trigrams across subject lists so that differences in learning effects would not be due to variation in trigram pronunciability, familiarity, etc. 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, a reduction in the number of trigrams learned by each individual, and the elmination of the trigram counterbalancing procedure.

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: Group I (LE)--8; Group II (HE)--6; Group III (LP)--7; Group IV (HP)--6; Group V (LA)--6; and Group VI (HA)--8. If a subject had more than three consistently-rated trigrams in either condition, the trigrams used in the data analyses were randomly selected, via a random numbers table, from the subject's pool of available items. The scoring for the two dependent measures used in this study was, therefore, based on a subject's recall of only six (rather than 12) trigrams, three (rather than six) in

each learning condition. The trials to criterion measure for each subject's sub-list of three trigrams was based on the sum of the trial numbers in which each of the three trigrams made its second, consecutive appearance. The percent-hits measure for each subject's sub-list was based on the total number of times a trigram was recalled over the number of trials that the subject took to recall her entire list of six trigrams twice in succession. Unfortunately, trigram matching or counterbalancing could not be achieved as the study was concluded at the end of a school semester and the original subjects could not be recalled to learn new lists of trigrams in which this factor was taken into consideration.

CHAPTER IV

RESULTS

The means and standard deviations for the trials to criterion and the percentage of correct recalls for the evaluative, potency, and activity groups are presented in Table I. The data were analyzed separately, using an unweighted means solution, for the two E, P, and A 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). Of principal interest in this study was the hypothesized interaction effect between factors. As will be seen, all experimental groups except for the low evaluative group followed the expected learning trend; that is, these groups learned their congruently-rated trigrams faster and better than their incongruently-rated trigrams. 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.

The analysis of variance used to compare the trials to criterion scores for the low and high E groups is presented in Table II. This analysis yielded no significant main or interaction effects, although the means were in the expected direction. That is, the low E's learned their low-rated trigrams faster than their high-rated trigrams and the high E's learned their high-rated trigrams more quickly than their low-

TABLE I

MEANS AND STANDARD DEVIATIONS OF TRIALS TO CRITERION AND PERCENTAGE OF CORRECT RECALLS AS A FUNCTION OF BI-POLAR SELF AND CVC RATINGS

	Trials to Criterion				Percentage of Correct Recalls			
	Trigram Ratings				Trigram Ratings			
	Low		High		Low		High	
Self Ratings	M	SD	M	SD	M	SD	M	SD
Group I, Low E (N = 8)	11.00	(2.62)	11.25	(4.40)	78.60	(8.11)	79.90	(11.57)
Group II, High E (N = 6)	11.17	(5.35)	8.83	(2.40)	80.42	(13.21)	87.88	(5.05)
Group III, Low P (N = 7)	8.43	(1.90)	9.29	(4.79)	89.75	(2.77)	87.69	(8.29)
Group IV, High P (N = 6)	12.17	(4.31)	8.83	(1.47)	81.25	(8.94)	87.63	(3.84)
Group V, Low A (N = 6)	9.33	(2.66)	10.83	(3.97)	88.72	(8.93)	84.14	(9.48)
Group VI, High A (N = 6)	12.63	(3.29)	10.25	(3.88)	78.09	(5.46)	83.97	(10.10)

TABLE II

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

Source of Variation	SS	df	MS	F
A (Self Ratings)	8.64	1	8.64	0.55
Subject w. Group Error	189.75	12	15.81	
B (Trigram Ratings)	7.48	1	7.48	0.54
AB	11.53	1	11.53	0.84
B x Subjects w. Group Error	165.41	12	13.78	

TABLE III

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

Source of Variation	SS	df	MS	F
A (Self Ratings)	164.78	1	164.78	1.72
Subjects w. Group Error	1152.81	12	96.07	
B (Trigram Ratings)	131.58	1	131.58	1.27
AB	65.03	1	65.03	0.63
B x Subjects w. Group Error	165.41	12	103.65	

rated trigrams. The comparison of the E groups' percentage of correct recall scores (Table III, page 67) also did not produce any significant effects. Again, the high E's appeared to acquire their congruently-rated trigrams better than their incongruently-rated items, but the low E's reversed this direction and learned their incongruently-rated trigrams better than their congruently-rated material.

The analysis of variance used to compare the trials to criterion scores for the low and high P groups yielded a significant interaction between bi-polar self and CVC ratings (Table IV). As predicted, the low P and high P groups learned the trigrams which they had rated to reflect their self-image significantly faster than they learned the trigrams which they had rated as opposite to their self-appraisal, $\underline{F}$ (1, 11) = 5.69, $\underline{p} < 0.05$. This effect appeared to be due primarily to the performance of the high P group. A graphic depiction of this interaction is presented in Figure 1. The analysis of variance used to compare the two groups' percentage of correct recall scores produced no significant main or interaction effects (Table V); however, the interaction effect did approach significance, $\underline{F}$ (1, 11) = 3.66, $\underline{p} < 0.10$. There was also a tendency toward a main effect for factor A (bi-polar self ratings) in favor of the low P group; that is, the low P group appeared to have a higher percentage of correct recalls for both their congruently- and incongruently-rated trigrams than the high P group had for their trigrams. Although this tendency was not as marked in the P groups' trials to criterion scores, Table I does reveal that the low P group took fewer trials to criterion to learn their trigrams than the high P group did to acquire their trigrams.

TABLE IV

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

Source of Variation	SS	df	MS	F
A (Self Ratings)	17.38	1	17.38	0.92
Subjects w. Group Error	207.71	11	18.89	
B (Trigram Ratings)	9.95	1	9.95	1.99
AB	28.49	1	28.49	5.69*
B x Subjects w. Group Error	55.09	11	5.01	

*$p < 0.05$.

TABLE V

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

Source of Variation	SS	df	MS	F
A (Self Ratings)	118.35	1	118.35	2.22
Subject w. Group Error	586.84	11	53.35	
B (Trigram Ratings)	30.10	1	30.10	0.96
AB	115.05	1	115.05	3.66°
B x Subjects w. Group Error	345.36	11	31.40	

°$p < 0.10$.

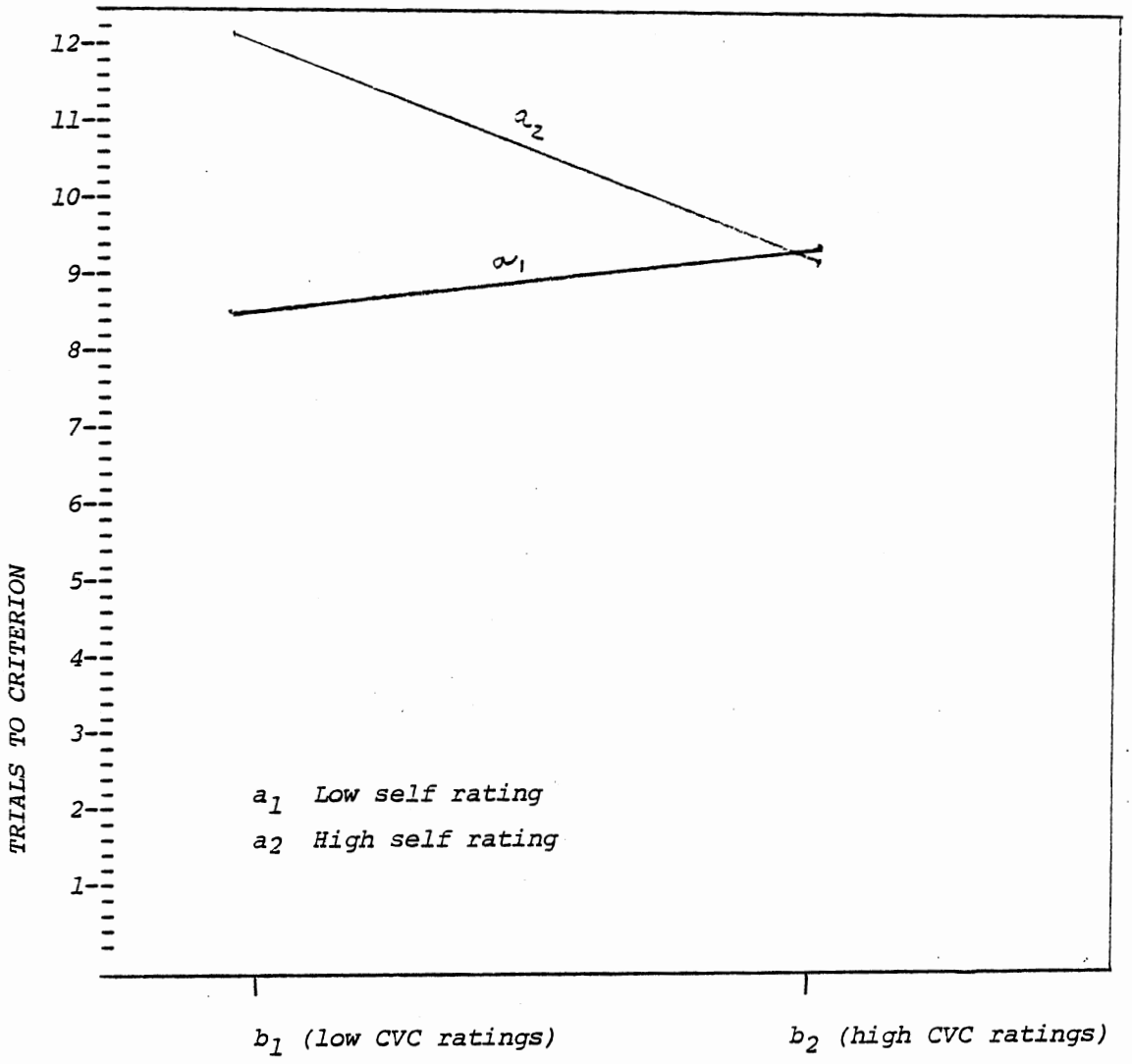

Figure 1. Mean Trials to Criterion for Low and High P Groups on Low- and High-Rated Trigrams

Comparisons of the two A groups' trials to criterion and percentage of correct recall scores are presented in Tables VI and VII, respectively. Although these analyses yielded no significant main or interaction effects, the interaction in the trials to criterion did approach significance, $\underline{F}$ (1, 12) = 3.42, $\underline{p} < 0.10$. Also, the means for the percentage of correct recall scores were in the direction predicted; that is, the low A group did learn their low-rated items better than their high-rated trigrams, while the high A group acquired their high-rated items better than their low-rated trigrams. As was the case with the analysis made of the P group scores, there was a tendency toward a main effect for factor A (bi-polar self ratings) in favor of the low A group; that is, the low A group had a higher percentage of correct recalls for all items than the high A group had for their trigrams. Although this tendency was not as pronounced in the A groups' trials to criterion scores, Table I does reveal that the low A group took fewer trials to criterion to acquire their items than the high A group did to learn their trigrams.

TABLE VI

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

Source of Variation	SS	df	MS	F
A (Self Ratings)	12.69	1	12.69	0.74
Subject w. Group Error	204.86	12	17.07	
B (Trigram Ratings)	1.30	1	1.30	0.17
AB	25.86	1	25.86	3.42°
B x Subjects w. Group Error	90.67	12	7.56	

°$p < 0.10$.

TABLE VII

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

Source of Variation	SS	df	MS	F
A (Self Ratings)	200.04	1	200.04	2.31
Subjects w. Group Error	1038.45	12	86.54	
B (Trigram Ratings)	2.95	1	2.95	0.05
AB	187.62	1	187.62	3.08
B x Subjects w. Group Error	731.51	12	60.96	

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 incongruent is considered supported in part by this study. While the E groups did not show any significant learning differences between their congruently and incongruently-rated trigrams, the P groups did; and the data for the A groups are certainly suggestive of a trend in this direction.

These results are at variance with the outcome of an earlier experiment conducted by Rychlak (Rychlak, Flynn & Burger, 1979) in which they found that Osgood's E dimension appeared to influence the learning styles of subjects, whereas the P and A dimensions did not. The difference in the outcome of these two studies, primarily with regard to the P and A dimensions, is thought to be due principally to the fact that Rychlak used a randomly-sampled population whereas the subjects in this experiment were assigned to the experimental groups based on their scores on the Self Inventory Scale. In fact, in the two studies in which Rychlak did use pretests to assign his subjects to groups (Rychlak, Tasto, Andrews & Ellis, 1973; Rychlak, Carlsen & Dunning, 1974) he found evidence to suggest that some subjects learned their congruently-rated material better than their incongruently-rated material. The fact that the E groups in this experiment failed to learn their congruently-rated trigrams

significantly faster than their incongruently-rated trigrams is, however, more difficult to reconcile with the results of other experiments conducted by Rychlak and his associates. The results of such studies have indicated that "normal" subjects or 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). Reasons for these discrepancies, as well as the fact that the performance of the A groups in this study failed to reach significance, may be due to any one or several of the following factors.

First, and most important, one must consider the possible effect on the outcome of this experiment of having to change the methodology after the collection of the data due to errors in the computer program designed to generate individual trigram lists for the subjects' learning trials. The exclusion of the 19 subjects who had to be dropped from the study, as well as the use of three trigrams in each learning condition instead of six, might have reduced variation and thus sensitivity to group differences. The fact that the trigrams could not be counterbalanced across subject lists also made it impossible to control for the influence of pronunciability or familiarity on learning effects.

A second possible reason for the fact that the low E group did not show the expected learning trend may be due to sex differences in learning. Although some of Rychlak's studies (Rychlak, Carlsen & Dunning, 1974; August, Rychlak & Felker, 1975; Rychlak, Flynn & Burger, 1979) indicated no learning differences between male and female subjects, other

experiments conducted by Rychlak and his associates (Rychlak, McKee, Schneider & Abramson, 1971; Rychlak, Tasto, Andrews & Ellis, 1973) revealed that males showed greater learning differences across congruent and incongruent conditions than females.

A third possible reason for the fact that the low E group did not show the expected learning trend may lie in the sample selection process, an especially important factor in the study of affective assessment. Specifically, it may be that the Self Inventory Scale failed to discriminate between subject personalities and classified individuals as low or high E's who were, in fact, not suitable candidates for inclusion in their respective groups. The frequency distribution of evaluative scores on the Self Inventory Scale of the initial sample (Figure 2) shows that only one subject in the E distribution scored in a negative direction as opposed to 57 negative scores in the P distribution (Figure 3) and eight negative scores in the A distribution (Figure 4). The failure of the Self Inventory Scale to obtain a representative sample of low E's may be due to the nature of the adjective descriptors used to comprise the evaluative meaning dimension. For instance, it is likely to be more difficult for a subject in a "normal" population to admit that she is "bad," "ugly," "awful," and "unpleasant" (E descriptors) as opposed to their opposites than it is to admit that she is "soft," "thin," "small," and even "weak" (P descriptors) or "light," "calm," "slow," or "passive" (A descriptors). The possibility that the P descriptors are more socially acceptable, at least for women in our society, than either the E or A descriptors may account for the fact that the P scores are more normally distributed than either the E or A scores. Therefore, the group classified as "low evaluators" by the Self Inventory Scale (i.e., the lower

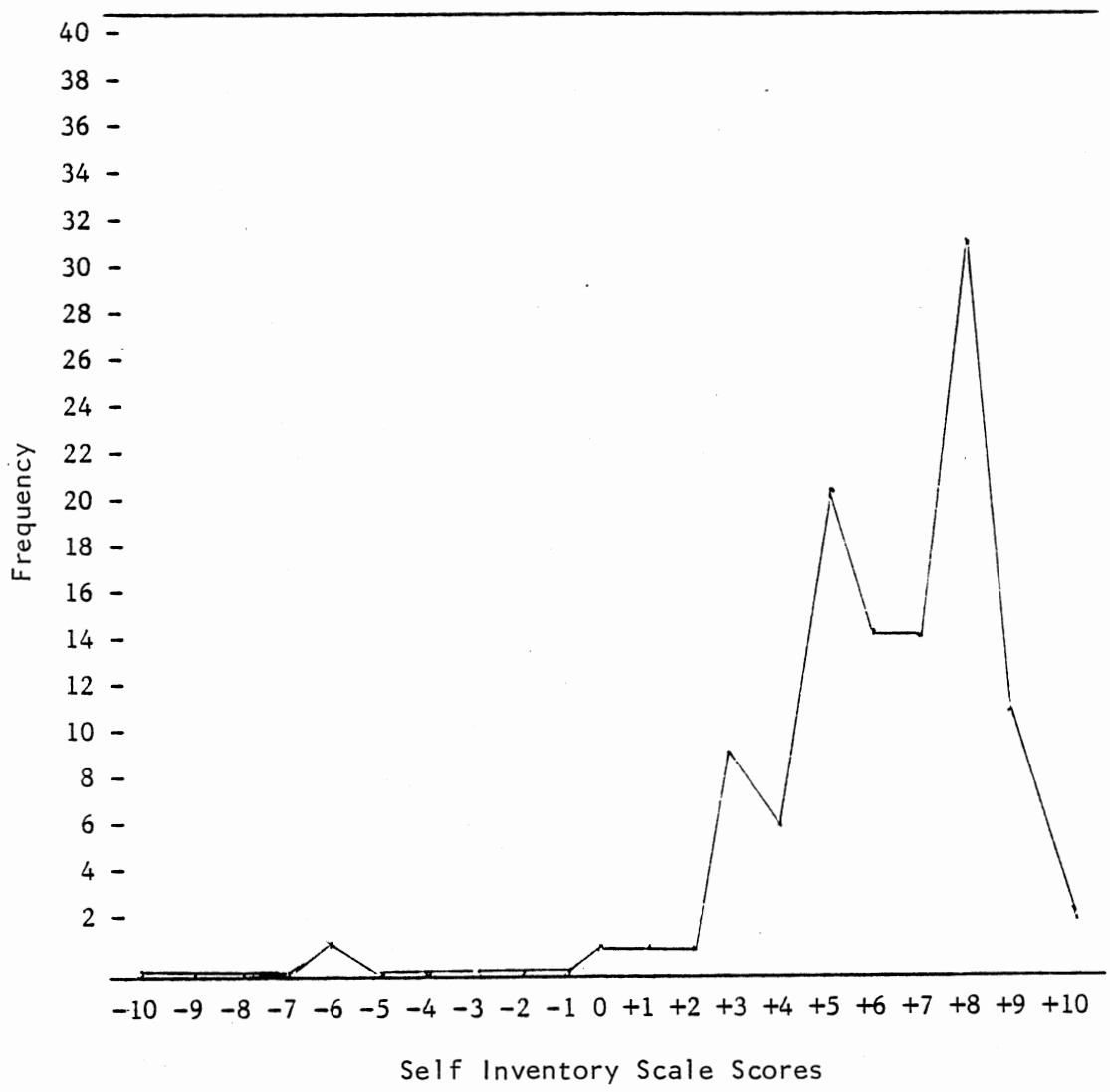

Figure 2. Frequency Distribution of Evaluative Scores on the Self Inventory Scale

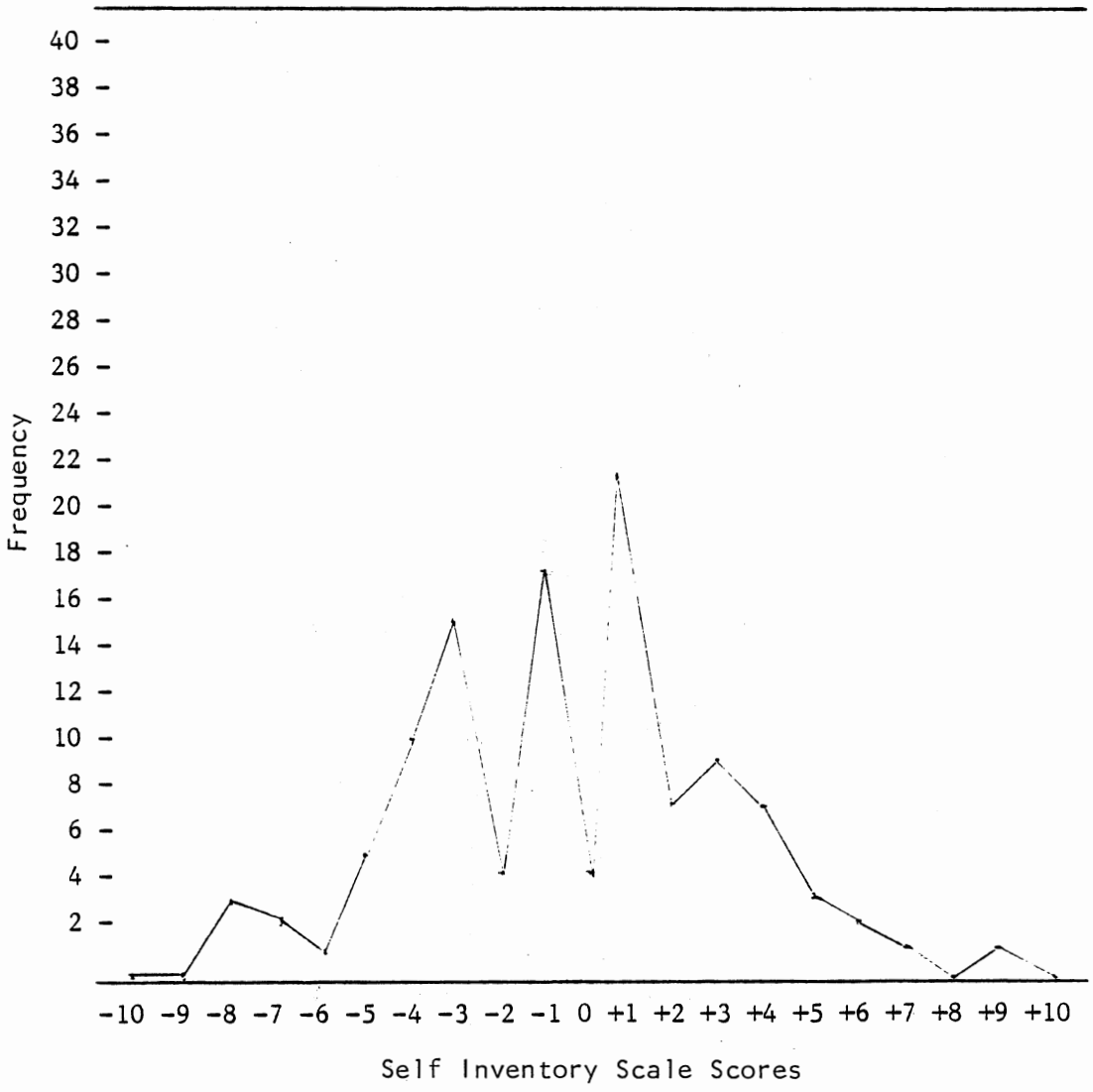

Figure 3. Frequency Distribution of Potency Scores on the Self Inventory Scale

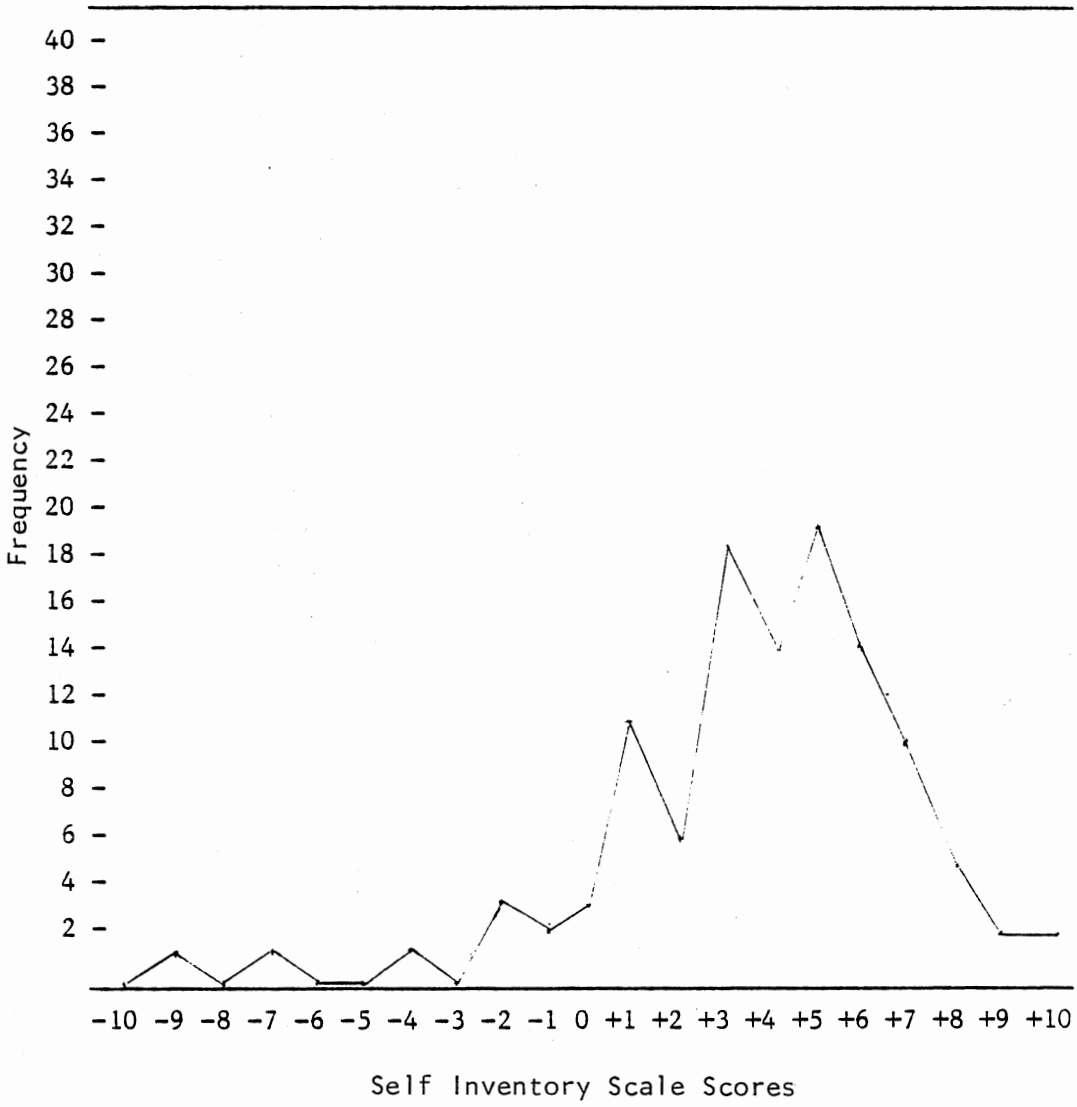

Figure 4. Frequency Distribution of Activity Scores on the Self Inventory Scale

tertile of the E distribution) may, in fact, have contained individuals who did not want to admit to being "low evaluators" and/or individuals who were, in reality, not "low evaluators." If such were the case, then the low E group would not be expected to learn their low-rated trigrams any faster than their high-rated trigrams.

The fact that the high E group's performance on the learning trials did not reach significance may also be due to contamination of the group by individuals who described themselves as "high evaluators" but who were, in reality, low evaluators who did not want to admit to having negative self-images. The same sort of contamination, only to a lesser degree, may have existed in the low and high A groups. That is, the low A group may have contained individuals who were, in fact, not low activity personalities. Similarly, the high A group may have contained individuals describing themselves as "high activity" personalities who were, in reality, low activity people who did not want to admit to the fact.

Such possible flaws in the sample selection instrument should be taken into account in the design of any future research in this area. For instance, the discriminating power of the Self Inventory Scale might be improved by the use of less negative descriptors for both the E and A meaning dimensions in the hope that individuals may be persuaded to be more open in their self-assessments. Also, the number of descriptors for each meaning dimension could be enlarged from five to ten, thereby increasing the options an individual might have in describing herself. Furthermore, a larger initial sample might also increase the probability of obtaining "uncontaminated" experimental groups. Finally, the four-point Likert-type rating scale could be made to be more sensitive in

distinguishing between personalities by being increased to six, rather than four, options.

Another interesting result in the data worthy of comment here is the tendency of the low P and A groups to acquire their congruently-rated trigrams in fewer trials and with a higher percentage of correct recalls than the high P and A groups. Such a tendency may be due to the possibility that high potency and activity women are subtly at variance with their expected social roles in our society. For instance, the high P descriptors ("hard," "thick," "large," and "strong") have been more customarily associated with males rather than females in our society, particularly in as politically and religiously conservative region as Oklahoma. Therefore, a woman who views herself as having more traditionally masculine characteristics may not feel as comfortable, accepted, or as positive about herself as a woman who describes herself along more conventionally feminine lines, such as "soft," "thin," "small," and "weak" (low P descriptors). This notion is supported by the fact that evaluative and potency scores on the Self Inventory Scale were negatively correlated ($r_{ep} = -0.40$); that is, women who depicted themselves as high evaluators also tended to picture themselves as low potency individuals. Such feelings as "being out of step" with expected norms may, then, lead high potency women to be somewhat defensive in their learning styles with the result that they find it more difficult to acquire congruently-rated material than their low potency counterparts. An earlier experiment conducted by Rychlak (Rychlak, Tasto, Andrews & Ellis, 1973) corroborates this possibility. In this study, in which women were assigned to "masculine personality" and "feminine personality" experimental groups based on their scores on the M-F scale of the Minnesota Multiphasic

Personality Inventory (Dahlstrom & Welsh, 1960), it was found that women describing themselves as "masculine" took longer to learn their liked material than did women describing themselves as "feminine."

The same "socially aberrant" effect may be operative in the learning styles of women who view themselves as "active," "fast," and "heavy" (high A descriptors) rather than "passive," "slow," and "light" (low A descriptors). It is interesting to note that four of the ten women in the high A group were attending Oklahoma State University on athletic scholarships. The growing interest in, and acceptance of, women in athletics is relatively new on the social scene. Again, this may lead such women to feel out of harmony with more traditional social norms, and, therefore, more defensive in their learning styles.

A second reason that the low A group acquired their congruently-rated material more quickly than the high A group may be due to a difference in personality variables often associated with "active" and "passive" individuals. It could be argued that active people are "doers" who are "always on the go," whereas passive individuals might be more sedate, more given to "thinking" rather than "doing," and, therefore, more likely to perform better on a verbal learning task. In pre-learning trial conversations with the four women athletes mentioned above, it was observed from their comments that they were, as a group, more highly interested in their athletic activities than in their studies. In fact, one of these individuals was late for her learning trials appointment because she had been practicing her golfing skills, while a second missed her appointment altogether and had to reschedule because of her tennis team activities.

In conclusion, it could be argued that in spite of the various flaws in this experiment, some lawful principle appears to be operative in the learning styles of the P groups and, to a lesser extent, in the A groups. The possibility that individuals may pay attention to and learn most easily those items which they judge to resemble their self-images has important implications for the identification and psychotherapeutic treatment of abnormal populations. 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 a fight with a spouse in which he/she is told that they "don't amount to anything." 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 an individual who noticed and acquires aspects of his/her experience which he/she judged to be "weak" (P descriptor) or "passive" (A descriptor) at the expense of those which he/she labeled as "strong" or "active," the more helpless would be his/her self-image and the more constrained

his/her world view. 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 they defer 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 evaluative, potency, and activity individuals would be handicapped in dealing effectively and realistically with their world.

The same handicap 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. 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. 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.

Treatment plans for all the individuals mentioned above might include the objective of helping them to enlarge their experience to include more of the dimension that they typically ignore or discount.

Treatment techniques used in accomplishing such objectives might include relaxation exercises for the high activity individual, assertiveness training for the low potency person, etc. 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 effectively and realistically with their world.

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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 then 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	( )	( )	( )	( )	16. GOZ	( )	( )	( )	( )
2. RAJ	( )	( )	( )	( )	17. JOX	( )	( )	( )	( )
3. WYR	( )	( )	( )	( )	18. MOY	( )	( )	( )	( )
4. YIR	( )	( )	( )	( )	19. PEM	( )	( )	( )	( )
5. YOC	( )	( )	( )	( )	20. QIC	( )	( )	( )	( )
6. RYF	( )	( )	( )	( )	21. WOB	( )	( )	( )	( )
7. RYK	( )	( )	( )	( )	22. WYM	( )	( )	( )	( )
8. SEQ	( )	( )	( )	( )	23. YUH	( )	( )	( )	( )
9. NUJ	( )	( )	( )	( )	24. CYK	( )	( )	( )	( )
10. PIV	( )	( )	( )	( )	25. DYS	( )	( )	( )	( )
11. FAP	( )	( )	( )	( )	26. HUZ	( )	( )	( )	( )
12. HIB	( )	( )	( )	( )	27. KEV	( )	( )	( )	( )
13. BEH	( )	( )	( )	( )	28. LIG	( )	( )	( )	( )
14. DEH	( )	( )	( )	( )	29. LIX	( )	( )	( )	( )
15. DYX	( )	( )	( )	( )	30. NEP	( )	( )	( )	( )

Syllable	(LM)	(LS)	(DS)	(DM)
31. TYD	( )	( )	( )	( )
32. VOX	( )	( )	( )	( )
33. YAT	( )	( )	( )	( )
34. BYK	( )	( )	( )	( )
35. GUC	( )	( )	( )	( )
36. RYN	( )	( )	( )	( )
37. SOV	( )	( )	( )	( )
38. WEV	( )	( )	( )	( )
39. YEZ	( )	( )	( )	( )
40. LUT	( )	( )	( )	( )
41. NUP	( )	( )	( )	( )
42. PID	( )	( )	( )	( )
43. GAW	( )	( )	( )	( )
44. KOS	( )	( )	( )	( )
45. KUN	( )	( )	( )	( )
46. CAG	( )	( )	( )	( )
47. FIL	( )	( )	( )	( )
48. FYX	( )	( )	( )	( )
49. FAZ	( )	( )	( )	( )
50. HOZ	( )	( )	( )	( )
51. JUM	( )	( )	( )	( )
52. MUV	( )	( )	( )	( )
53. NAS	( )	( )	( )	( )
54. PIQ	( )	( )	( )	( )
55. SYK	( )	( )	( )	( )
56. WYT	( )	( )	( )	( )
57. ZEL	( )	( )	( )	( )
58. HYT	( )	( )	( )	( )
59. JOD	( )	( )	( )	( )
60. TUS	( )	( )	( )	( )
61. WUD	( )	( )	( )	( )
62. JAV	( )	( )	( )	( )
63. LYM	( )	( )	( )	( )
	(LM)	(LS)	(DS)	(DM)

Syllable	(LM)	(LS)	(DS)	(DM)
64. PEB	( )	( )	( )	( )
65. PYC	( )	( )	( )	( )
66. WEG	( )	( )	( )	( )
67. WYP	( )	( )	( )	( )
68. BYN	( )	( )	( )	( )
69. DYP	( )	( )	( )	( )
70. TYC	( )	( )	( )	( )
71. ZAC	( )	( )	( )	( )
72. FAV	( )	( )	( )	( )
73. MOH	( )	( )	( )	( )
74. NAL	( )	( )	( )	( )
75. PIF	( )	( )	( )	( )
76. PIM	( )	( )	( )	( )
77. BEP	( )	( )	( )	( )
78. BYT	( )	( )	( )	( )
79. JEP	( )	( )	( )	( )
80. RIS	( )	( )	( )	( )
81. RIX	( )	( )	( )	( )
82. TOX	( )	( )	( )	( )
83. VIL	( )	( )	( )	( )
84. WAH	( )	( )	( )	( )
85. WAQ	( )	( )	( )	( )
86. WOF	( )	( )	( )	( )
87. GOF	( )	( )	( )	( )
88. NYC	( )	( )	( )	( )
89. PAB	( )	( )	( )	( )
90. PYG	( )	( )	( )	( )
91. KYT	( )	( )	( )	( )
92. TIX	( )	( )	( )	( )
93. VOG	( )	( )	( )	( )
94. WID	( )	( )	( )	( )
95. WOK	( )	( )	( )	( )
96. LEP	( )	( )	( )	( )
	(LM)	(LS)	(DS)	(DM)

Syllable	(LM)	(LS)	(DS)	(DM)
97. LOD	( )	( )	( )	( )
98. LOM	( )	( )	( )	( )
99. KEM	( )	( )	( )	( )
100. KIR	( )	( )	( )	( )
101. KOC	( )	( )	( )	( )
102. KYD	( )	( )	( )	( )
103. KAF	( )	( )	( )	( )
104. KEL	( )	( )	( )	( )
105. SYP	( )	( )	( )	( )
106. VIR	( )	( )	( )	( )
107. FIV	( )	( )	( )	( )
108. GES	( )	( )	( )	( )
109. PIZ	( )	( )	( )	( )
110. QIT	( )	( )	( )	( )
111. RYD	( )	( )	( )	( )
112. NUG	( )	( )	( )	( )
113. TOB	( )	( )	( )	( )
114. KAS	( )	( )	( )	( )
115. DUR	( )	( )	( )	( )
116. DAF	( )	( )	( )	( )
117. DUP	( )	( )	( )	( )
118. HEK	( )	( )	( )	( )
	(LM)	(LS)	(DS)	(DM)

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

APPENDIX B

SELF INVENTORY SCALE

Self Inventory Scale

Name: _____ Age: __ Birthdate: _____ Sex: __

Phone No.: _____ Office: _____ Educational Classification: ___

Instructor: _____ Class Hour: _____

Instructions: Below 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 very relaxed or very tense, you would place an "X" in the appropriate space marked "very"; if you feel yourself to be moderately relaxed or tense, you would place an "X" in one of the spaces marked "moderately."

Very Moderately Moderately Very

Relaxed ____:_____:_____:____ Tense

Important: Be sure to make 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.

	Very	Moderately	Moderately	Very	
(1) HARD	_____ :	_____ :	_____ :	_____	SOFT
(2) THICK	_____ :	_____ :	_____ :	_____	THIN
(3) GOOD	_____ :	_____ :	_____ :	_____	BAD
(4) WEAK	_____ :	_____ :	_____ :	_____	STRONG
(5) BEAUTIFUL	_____ :	_____ :	_____ :	_____	UGLY
(6) COLD	_____ :	_____ :	_____ :	_____	HOT
(7) NICE	_____ :	_____ :	_____ :	_____	AWFUL
(8) PLEASANT	_____ :	_____ :	_____ :	_____	UNPLEASANT
(9) SHARP	_____ :	_____ :	_____ :	_____	DULL
(10) HAPPY	_____ :	_____ :	_____ :	_____	SAD
(11) PASSIVE	_____ :	_____ :	_____ :	_____	ACTIVE
(12) FAST	_____ :	_____ :	_____ :	_____	SLOW
(13) LIGHT	_____ :	_____ :	_____ :	_____	HEAVY
(14) SMALL	_____ :	_____ :	_____ :	_____	LARGE
(15) EXCITABLE	_____ :	_____ :	_____ :	_____	CALM

APPENDIX C

PHONETIC IMPRESSION INVENTORY

FORMS E, P, AND A

Phonetic Impression Inventory, Form E

Name: _____ Age: ___ Sex: __

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," "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, on the other hand, you think the trigram sounds moderately good or moderately bad, place an "X" in the space labeled "MG" or "MB." 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 feeling may be, every trigram must be rated to indicate whether you think it is:

VG (Very good)
MG (Moderately good)
MB (Moderately bad)
VB (Very bad)

Syllable	(VG)	(MG)	(MB)	(VB)	Syllable	(VG)	(MG)	(MB)	(VB)
1. JOR	( )	( )	( )	( )	17. JOX	( )	( )	( )	( )
2. RAJ	( )	( )	( )	( )	18. MOY	( )	( )	( )	( )
3. WYR	( )	( )	( )	( )	19. PEM	( )	( )	( )	( )
4. YIR	( )	( )	( )	( )	20. QIC	( )	( )	( )	( )
5. YOC	( )	( )	( )	( )	21. WOB	( )	( )	( )	( )
6. RYF	( )	( )	( )	( )	22. WYM	( )	( )	( )	( )
7. RYK	( )	( )	( )	( )	23. YUH	( )	( )	( )	( )
8. SEQ	( )	( )	( )	( )	24. CYK	( )	( )	( )	( )
9. NUJ	( )	( )	( )	( )	25. DYS	( )	( )	( )	( )
10. PIV	( )	( )	( )	( )	26. HUZ	( )	( )	( )	( )
11. FAP	( )	( )	( )	( )	27. KEV	( )	( )	( )	( )
12. HIB	( )	( )	( )	( )	28. LIG	( )	( )	( )	( )
13. BEH	( )	( )	( )	( )	29. LIX	( )	( )	( )	( )
14. DEH	( )	( )	( )	( )	30. NEP	( )	( )	( )	( )
15. DYX	( )	( )	( )	( )	31. TYD	( )	( )	( )	( )
16. GOZ	( )	( )	( )	( )	32. VOX	( )	( )	( )	( )

(VG) (Very good)
(MG) (Moderately good)
(MB) (Moderately bad)
(VB) (Very bad)

Syllable	(VG)	(MG)	(MB)	(VB)	Syllable	(VG)	(MG)	(MB)	(VB)
33. YAT	( )	( )	( )	( )	63. LYM	( )	( )	( )	( )
34. BYK	( )	( )	( )	( )	64. PEB	( )	( )	( )	( )
35. GUC	( )	( )	( )	( )	65. PYC	( )	( )	( )	( )
36. RYN	( )	( )	( )	( )	66. WEG	( )	( )	( )	( )
37. SOV	( )	( )	( )	( )	67. WYP	( )	( )	( )	( )
38. WEV	( )	( )	( )	( )	68. BYN	( )	( )	( )	( )
39. YEZ	( )	( )	( )	( )	69. DYP	( )	( )	( )	( )
40. LUT	( )	( )	( )	( )	70. TYC	( )	( )	( )	( )
41. NUP	( )	( )	( )	( )	71. ZAC	( )	( )	( )	( )
42. PID	( )	( )	( )	( )	72. FAV	( )	( )	( )	( )
43. GAW	( )	( )	( )	( )	73. MOH	( )	( )	( )	( )
44. KOS	( )	( )	( )	( )	74. NAL	( )	( )	( )	( )
45. KUN	( )	( )	( )	( )	75. PIF	( )	( )	( )	( )
46. CAG	( )	( )	( )	( )	76. PIM	( )	( )	( )	( )
47. FIL	( )	( )	( )	( )	77. BEP	( )	( )	( )	( )
48. FYX	( )	( )	( )	( )	78. BYT	( )	( )	( )	( )
49. FAZ	( )	( )	( )	( )	79. JEP	( )	( )	( )	( )
50. HOZ	( )	( )	( )	( )	80. RIS	( )	( )	( )	( )
51. JUM	( )	( )	( )	( )	81. RIX	( )	( )	( )	( )
52. MUV	( )	( )	( )	( )	82. TOX	( )	( )	( )	( )
53. NAS	( )	( )	( )	( )	83. VIL	( )	( )	( )	( )
54. PIQ	( )	( )	( )	( )	84. WAH	( )	( )	( )	( )
55. SYK	( )	( )	( )	( )	85. WAQ	( )	( )	( )	( )
56. WYT	( )	( )	( )	( )	86. WOF	( )	( )	( )	( )
57. ZEL	( )	( )	( )	( )	87. GOF	( )	( )	( )	( )
58. HYT	( )	( )	( )	( )	88. NYC	( )	( )	( )	( )
59. JOD	( )	( )	( )	( )	89. PAB	( )	( )	( )	( )
60. TUS	( )	( )	( )	( )	90. PYG	( )	( )	( )	( )
61. WUD	( )	( )	( )	( )	91. KYT	( )	( )	( )	( )
62. JAV	( )	( )	( )	( )	92. TIX	( )	( )	( )	( )

Syllable	(VG)	(MG)	(MB)	(VB)	Syllable	(VG)	(MG)	(MB)	(VB)

(VG) (Very good)
(MG) (Moderately good)
(MB) (Moderately bad)
(VB) (Very bad)

Syllable	(VG)	(MG)	(MB)	(VB)	Syllable	(VG)	(MG)	(MB)	(VB)
93. VOG	( )	( )	( )	( )	117. DUP	( )	( )	( )	( )
94. WID	( )	( )	( )	( )	118. HEK	( )	( )	( )	( )
95. WOK	( )	( )	( )	( )	119. MAJ	( )	( )	( )	( )
96. LEP	( )	( )	( )	( )	120. NAK	( )	( )	( )	( )
97. LOD	( )	( )	( )	( )	121. PAG	( )	( )	( )	( )
98. LOM	( )	( )	( )	( )	122. SIB	( )	( )	( )	( )
99. KEM	( )	( )	( )	( )	123. CAY	( )	( )	( )	( )
100. KIR	( )	( )	( )	( )	124. COZ	( )	( )	( )	( )
101. KOC	( )	( )	( )	( )	125. VIK	( )	( )	( )	( )
102. KYD	( )	( )	( )	( )	126. BEY	( )	( )	( )	( )
103. KAF	( )	( )	( )	( )	127. BIF	( )	( )	( )	( )
104. KEL	( )	( )	( )	( )	128. JUS	( )	( )	( )	( )
105. SYP	( )	( )	( )	( )	129. KER	( )	( )	( )	( )
106. VIR	( )	( )	( )	( )	130. RES	( )	( )	( )	( )
107. FIV	( )	( )	( )	( )	131. VAS	( )	( )	( )	( )
108. GES	( )	( )	( )	( )	132. LAR	( )	( )	( )	( )
109. PIZ	( )	( )	( )	( )	133. MAH	( )	( )	( )	( )
110. QIT	( )	( )	( )	( )	134. YAW	( )	( )	( )	( )
111. RYD	( )	( )	( )	( )	135. CAV	( )	( )	( )	( )
112. NUG	( )	( )	( )	( )	136. FAC	( )	( )	( )	( )
113. TOB	( )	( )	( )	( )	137. GAV	( )	( )	( )	( )
114. KAS	( )	( )	( )	( )	138. RYM	( )	( )	( )	( )
115. DUR	( )	( )	( )	( )	139. YEH	( )	( )	( )	( )
116. DAF	( )	( )	( )	( )	140. BIZ	( )	( )	( )	( )

Syllable	(VG)	(MG)	(MB)	(VB)	Syllable	(VG)	(MG)	(MB)	(VB)

Phonetic Impression Inventory, Form P

Name: _____ Age: ___ Sex: __

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," "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, on the other hand, you think the trigram sounds moderately strong or moderately weak, place an "X" in the space labeled "MS" or "MW." 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 feeling may be, every trigram must be rated to indicate whether you think it is:

(VS) (Very strong)
(MS) (Moderately strong)
(MW) (Moderately weak)
(VW) (Very weak)

Syllable	(VS)	(MS)	(MW)	(VW)	Syllable	(VS)	(MS)	(MW)	(VW)
1. JOR	( )	( )	( )	( )	17. JOX	( )	( )	( )	( )
2. RAJ	( )	( )	( )	( )	18. MOY	( )	( )	( )	( )
3. WYR	( )	( )	( )	( )	19. PEM	( )	( )	( )	( )
4. YIR	( )	( )	( )	( )	20. QIC	( )	( )	( )	( )
5. YOC	( )	( )	( )	( )	21. WOB	( )	( )	( )	( )
6. RYF	( )	( )	( )	( )	22. WYM	( )	( )	( )	( )
7. RYK	( )	( )	( )	( )	23. YUH	( )	( )	( )	( )
8. SEQ	( )	( )	( )	( )	24. CYK	( )	( )	( )	( )
9. NUJ	( )	( )	( )	( )	25. DYS	( )	( )	( )	( )
10. PIV	( )	( )	( )	( )	26. HUZ	( )	( )	( )	( )
11. FAP	( )	( )	( )	( )	27. KEV	( )	( )	( )	( )
12. HIB	( )	( )	( )	( )	28. LIG	( )	( )	( )	( )
13. BEH	( )	( )	( )	( )	29. LIX	( )	( )	( )	( )
14. DEH	( )	( )	( )	( )	30. NEP	( )	( )	( )	( )
15. DYX	( )	( )	( )	( )	31. TYD	( )	( )	( )	( )
16. GOZ	( )	( )	( )	( )	32. VOX	( )	( )	( )	( )

(VS) (Very strong)
(MS) (Moderately strong)
(MW) (Moderately weak)
(VW) (Very weak)

Syllable	(VS)	(MS)	(MW)	(VW)	Syllable	(VS)	(MS)	(MW)	(VW)
33. YAT	( )	( )	( )	( )	63. LYM	( )	( )	( )	( )
34. BYK	( )	( )	( )	( )	64. PEB	( )	( )	( )	( )
35. GUC	( )	( )	( )	( )	65. PYC	( )	( )	( )	( )
36. RYN	( )	( )	( )	( )	66. WEG	( )	( )	( )	( )
37. SOV	( )	( )	( )	( )	67. WYP	( )	( )	( )	( )
38. WEV	( )	( )	( )	( )	68. BYN	( )	( )	( )	( )
39. YEZ	( )	( )	( )	( )	69. DYP	( )	( )	( )	( )
40. LUT	( )	( )	( )	( )	70. TYC	( )	( )	( )	( )
41. NUP	( )	( )	( )	( )	71. ZAC	( )	( )	( )	( )
42. PID	( )	( )	( )	( )	72. FAV	( )	( )	( )	( )
43. GAW	( )	( )	( )	( )	73. MOH	( )	( )	( )	( )
44. KOS	( )	( )	( )	( )	74. NAL	( )	( )	( )	( )
45. KUN	( )	( )	( )	( )	75. PIF	( )	( )	( )	( )
46. CAG	( )	( )	( )	( )	76. PIM	( )	( )	( )	( )
47. FIL	( )	( )	( )	( )	77. BEP	( )	( )	( )	( )
48. FYX	( )	( )	( )	( )	78. BYT	( )	( )	( )	( )
49. FAZ	( )	( )	( )	( )	79. JEP	( )	( )	( )	( )
50. HOZ	( )	( )	( )	( )	80. RIS	( )	( )	( )	( )
51. JUM	( )	( )	( )	( )	81. RIX	( )	( )	( )	( )
52. MUV	( )	( )	( )	( )	82. TOX	( )	( )	( )	( )
53. NAS	( )	( )	( )	( )	83. VIL	( )	( )	( )	( )
54. PIQ	( )	( )	( )	( )	84. WAH	( )	( )	( )	( )
55. SYK	( )	( )	( )	( )	85. WAQ	( )	( )	( )	( )
56. WYT	( )	( )	( )	( )	86. WOF	( )	( )	( )	( )
57. ZEL	( )	( )	( )	( )	87. GOF	( )	( )	( )	( )
58. HYT	( )	( )	( )	( )	88. NYC	( )	( )	( )	( )
59. JOD	( )	( )	( )	( )	89. PAB	( )	( )	( )	( )
60. TUS	( )	( )	( )	( )	90. PYG	( )	( )	( )	( )
61. WUD	( )	( )	( )	( )	91. KYT	( )	( )	( )	( )
62. JAV	( )	( )	( )	( )	92. TIX	( )	( )	( )	( )

Syllable	(VS)	(MS)	(MW)	(VW)	Syllable	(VS)	(MS)	(MW)	(VW)

(VS) (Very strong)
(MS) (Moderately strong)
(MW) (Moderately weak)
(VW) (Very weak)

Syllable	(VS)	(MS)	(MW)	(VW)	Syllable	(VS)	(MS)	(MW)	(VW)
93. VOG	( )	( )	( )	( )	117. DUP	( )	( )	( )	( )
94. WID	( )	( )	( )	( )	118. HEK	( )	( )	( )	( )
95. WOK	( )	( )	( )	( )	119. MAJ	( )	( )	( )	( )
96. LEP	( )	( )	( )	( )	120. NAK	( )	( )	( )	( )
97. LOD	( )	( )	( )	( )	121. PAG	( )	( )	( )	( )
98. LOM	( )	( )	( )	( )	122. SIB	( )	( )	( )	( )
99. KEM	( )	( )	( )	( )	123. CAY	( )	( )	( )	( )
100. KIR	( )	( )	( )	( )	124. COZ	( )	( )	( )	( )
101. KOC	( )	( )	( )	( )	125. VIK	( )	( )	( )	( )
102. KYD	( )	( )	( )	( )	126. BEY	( )	( )	( )	( )
103. KAF	( )	( )	( )	( )	127. BIF	( )	( )	( )	( )
104. KEL	( )	( )	( )	( )	128. JUS	( )	( )	( )	( )
105. SYP	( )	( )	( )	( )	129. KER	( )	( )	( )	( )
106. VIR	( )	( )	( )	( )	130. RES	( )	( )	( )	( )
107. FIV	( )	( )	( )	( )	131. VAS	( )	( )	( )	( )
108. GES	( )	( )	( )	( )	132. LAR	( )	( )	( )	( )
109. PIZ	( )	( )	( )	( )	133. MAH	( )	( )	( )	( )
110. QIT	( )	( )	( )	( )	134. YAW	( )	( )	( )	( )
111. RYD	( )	( )	( )	( )	135. CAV	( )	( )	( )	( )
112. NUG	( )	( )	( )	( )	136. FAC	( )	( )	( )	( )
113. TOB	( )	( )	( )	( )	137. GAV	( )	( )	( )	( )
114. KAS	( )	( )	( )	( )	138. RYM	( )	( )	( )	( )
115. DUR	( )	( )	( )	( )	139. YEH	( )	( )	( )	( )
116. DAF	( )	( )	( )	( )	140. BIZ	( )	( )	( )	( )

Syllable	(VS)	(MS)	(MW)	(VW)	Syllable	(VS)	(MS)	(MW)	(VW)

Phonetic Impression Inventory, Form A

Name: _____ Age: ___ Sex: __

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," "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, on the other hand, you think the trigram sounds moderately active or moderately passive, place an "X" in the space labeled "MA" or "MP." 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 feeling may be, every trigram must be rated to indicate whether you think it is:

(VA) (Very active)
(MA) (Moderately active)
(MP) (Moderately passive)
(VP) (Very passive)

Syllable	(VA)	(MA)	(MP)	(VP)	Syllable	(VA)	(MA)	(MP)	(VP)
1. JOR	( )	( )	( )	( )	17. JOX	( )	( )	( )	( )
2. RAJ	( )	( )	( )	( )	18. MOY	( )	( )	( )	( )
3. WYR	( )	( )	( )	( )	19. PEM	( )	( )	( )	( )
4. YIR	( )	( )	( )	( )	20. QIC	( )	( )	( )	( )
5. YOC	( )	( )	( )	( )	21. WOB	( )	( )	( )	( )
6. RYF	( )	( )	( )	( )	22. WYM	( )	( )	( )	( )
7. RYK	( )	( )	( )	( )	23. YUH	( )	( )	( )	( )
8. SEQ	( )	( )	( )	( )	24. CYK	( )	( )	( )	( )
9. NUJ	( )	( )	( )	( )	25. DYS	( )	( )	( )	( )
10. PIV	( )	( )	( )	( )	26. HUZ	( )	( )	( )	( )
11. FAP	( )	( )	( )	( )	27. KEV	( )	( )	( )	( )
12. HIB	( )	( )	( )	( )	28. LIG	( )	( )	( )	( )
13. BEH	( )	( )	( )	( )	29. LIX	( )	( )	( )	( )
14. DEH	( )	( )	( )	( )	30. NEP	( )	( )	( )	( )
15. DYX	( )	( )	( )	( )	31. TYD	( )	( )	( )	( )
16. GOZ	( )	( )	( )	( )	32. VOX	( )	( )	( )	( )

(VA) (Very active)
(MA) (Moderately active)
(MP) (Moderately passive)
(VP) (Very passive)

Syllable	(VA)	(MA)	(MP)	(VP)	Syllable	(VA)	(MA)	(MP)	(VP)
33. YAT	( )	( )	( )	( )	63. LYM	( )	( )	( )	( )
34. BYK	( )	( )	( )	( )	64. PEB	( )	( )	( )	( )
35. GUC	( )	( )	( )	( )	65. PYC	( )	( )	( )	( )
36. RYN	( )	( )	( )	( )	66. WEG	( )	( )	( )	( )
37. SOV	( )	( )	( )	( )	67. WYP	( )	( )	( )	( )
38. WEV	( )	( )	( )	( )	68. BYN	( )	( )	( )	( )
39. YEZ	( )	( )	( )	( )	69. DYP	( )	( )	( )	( )
40. LUT	( )	( )	( )	( )	70. TYC	( )	( )	( )	( )
41. NUP	( )	( )	( )	( )	71. ZAC	( )	( )	( )	( )
42. PID	( )	( )	( )	( )	72. FAV	( )	( )	( )	( )
43. GAW	( )	( )	( )	( )	73. MOH	( )	( )	( )	( )
44. KOS	( )	( )	( )	( )	74. NAL	( )	( )	( )	( )
45. KUN	( )	( )	( )	( )	75. PIF	( )	( )	( )	( )
46. CAG	( )	( )	( )	( )	76. PIM	( )	( )	( )	( )
47. FIL	( )	( )	( )	( )	77. BEP	( )	( )	( )	( )
48. FYX	( )	( )	( )	( )	78. BYT	( )	( )	( )	( )
49. FAZ	( )	( )	( )	( )	79. JEP	( )	( )	( )	( )
50. HOZ	( )	( )	( )	( )	80. RIS	( )	( )	( )	( )
51. JUM	( )	( )	( )	( )	81. RIX	( )	( )	( )	( )
52. MUV	( )	( )	( )	( )	82. TOX	( )	( )	( )	( )
53. NAS	( )	( )	( )	( )	83. VIL	( )	( )	( )	( )
54. PIQ	( )	( )	( )	( )	84. WAH	( )	( )	( )	( )
55. SYK	( )	( )	( )	( )	85. WAQ	( )	( )	( )	( )
56. WYT	( )	( )	( )	( )	86. WOF	( )	( )	( )	( )
57. ZEL	( )	( )	( )	( )	87. GOF	( )	( )	( )	( )
58. HYT	( )	( )	( )	( )	88. NYC	( )	( )	( )	( )
59. JOD	( )	( )	( )	( )	89. PAB	( )	( )	( )	( )
60. TUS	( )	( )	( )	( )	90. PYG	( )	( )	( )	( )
61. WUD	( )	( )	( )	( )	91. KYT	( )	( )	( )	( )
62. JAV	( )	( )	( )	( )	92. TIX	( )	( )	( )	( )

Syllable	(VA)	(MA)	(MP)	(VP)	Syllable	(VA)	(MA)	(MP)	(VP)

(VA) (Very active)
(MA) (Moderately active)
(MP) (Moderately passive)
(VP) (Very passive)

Syllable	(VA)	(MA)	(MP)	(VP)	Syllable	(VA)	(MA)	(MP)	(VP)
93. VOG	( )	( )	( )	( )	117. DUP	( )	( )	( )	( )
94. WID	( )	( )	( )	( )	118. HEK	( )	( )	( )	( )
95. WOK	( )	( )	( )	( )	119. MAJ	( )	( )	( )	( )
96. LEP	( )	( )	( )	( )	120. NAK	( )	( )	( )	( )
97. LOD	( )	( )	( )	( )	121. PAG	( )	( )	( )	( )
98. LOM	( )	( )	( )	( )	122. SIB	( )	( )	( )	( )
99. KEM	( )	( )	( )	( )	123. CAY	( )	( )	( )	( )
100. KIR	( )	( )	( )	( )	124. COZ	( )	( )	( )	( )
101. KOC	( )	( )	( )	( )	125. VIK	( )	( )	( )	( )
102. KYD	( )	( )	( )	( )	126. BEY	( )	( )	( )	( )
103. KAF	( )	( )	( )	( )	127. BIF	( )	( )	( )	( )
104. KEL	( )	( )	( )	( )	128. JUS	( )	( )	( )	( )
105. SYP	( )	( )	( )	( )	129. KER	( )	( )	( )	( )
106. VIR	( )	( )	( )	( )	130. RES	( )	( )	( )	( )
107. FIV	( )	( )	( )	( )	131. VAS	( )	( )	( )	( )
108. GES	( )	( )	( )	( )	132. LAR	( )	( )	( )	( )
109. PIZ	( )	( )	( )	( )	133. MAH	( )	( )	( )	( )
110. QIT	( )	( )	( )	( )	134. YAW	( )	( )	( )	( )
111. RYD	( )	( )	( )	( )	135. CAV	( )	( )	( )	( )
112. NUG	( )	( )	( )	( )	136. FAC	( )	( )	( )	( )
113. TOB	( )	( )	( )	( )	137. GAV	( )	( )	( )	( )
114. KAS	( )	( )	( )	( )	138. RYM	( )	( )	( )	( )
115. DUR	( )	( )	( )	( )	139. YEH	( )	( )	( )	( )
116. DAF	( )	( )	( )	( )	140. BIZ	( )	( )	( )	( )

Syllable	(VA)	(MA)	(MP)	(VP)	Syllable	(VA)	(MA)	(MP)	(VP)

APPENDIX D

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 E

FREE RECALL TASK ANSWER SHEET

Subject's Name: _____

Trial: ____

Please Print Legibly

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

VITA 2

Virginia Llanso-Cummins

Candidate for the Degree of

Master of Science

Thesis: VERBAL LEARNING AS A FUNCTION OF SEMANTIC DIFFERENTIAL RATINGS OF SELF AND CVC TRIGRAMS

Major Field: Psychology

Biographical:

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