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EVALUATIVE MEANING AND SIMILARITY TO SELF-CONCEPT
AS CONDITIONERS OF ATTITUDES TOWARD TRIGRAMS

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OF THE REQUIREMENTS FOR THE DEGREE OF
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by

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ABSTRACT

Recent conceptualizations have used a classical conditioning model to account for the formation of interpersonal attraction. In general, the model suggests that when a person as a stimulus object is paired with pleasant or reinforcing events the person will come to elicit an attraction response similar to that originally elicited by the reinforcing event. In explanation of the relationship between attraction and similarity of attitudes and personality traits, one of these models has suggested that similarity between persons functions as a special type of reinforcing event which derives its power from consensual validation or social comparison. The thesis of the present study is that similarity may not comprise a separate category of reinforcement but may derive its apparent reinforcing value from the fact that it is a correlate of pleasantness.

Ss were pre-tested by having them rate, on two seven-point scales, the degree to which words were pleasant-unpleasant or descriptive-not descriptive of themselves. Four categories of twelve words per category were then selected for each S: words which were pleasant and like S, unpleasant and unlike S, pleasant but unlike S, and unpleasant but like S. Each category was then used as UCS words which were paired with trigrams as CS words according to the Staats procedure for conditioning meaning.
The finding was that the evaluative (pleasant-unpleasant) and similarity (like me-unlike me) scales were highly positively correlated ($r = .84$). When the two variables were held constant across levels of each other, it was found that evaluation accurately predicted direction of conditioning of attitudes toward trigrams and that similarity ratings did not contribute to this prediction. It was proposed that the more hedonistic and behavioral concept of rated pleasantness may account for many of the apparent reinforcing effects of similarity without resorting to more cognitive terminology.
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CHAPTER I
SIMILARITY AND INTERPERSONAL ATTRACTION

The observation that individuals who are alike are attracted to one another is apparently an old one, at least as old as Aristotle's Rhetoric (see Byrne, in press, for a review of the antecedents of the similarity-attraction hypothesis). In recent decades this relationship has been the object of abundant scientific investigation and has formed a primary law of a number of theories of interpersonal attraction. Homans (1950), for example, has hypothesized that the more similar persons are in activities and sentiments the greater will be the frequency of their interaction and affection for one another. Similarly, Newcomb (1956) has said that similarity of attitudes held by individuals probably accounts for more of the variance in interpersonal attraction than does any other factor.

Probably the most consistent support for the similarity-attraction notion has been found with regard to similarity of attitudes (e.g., Byrne, 1961, 1962; Byrne and London, 1966; Byrne and Nelson, 1964; Festinger, 1954; Gross, 1954; Newcomb, 1956; Precker, 1952; Richardson, 1940; Winslow, 1937). Support has also been found with regard to similarity of backgrounds (Broxton, 1962), popularity (Backman and Secord, 1964), abilities (Zander and Havelin, 1960), economic status (Byrne, Clore, and Worchel, 1966), and personality (Byrne, Griffitt,
and Stefaniak, 1967; Griffitt, 1966; Izard, 1960; Secord and Backman, 1964; Tharp, 1963). Some research has not supported the similarity-attraction hypothesis for the personality variable (e.g., Cohen, 1956, Schutz, 1961; Winch, 1958), and Winch (1958) has provided a theory which suggests that it is not similarity of personality which results in attraction but complementarity of needs. Byrne and his associates (e.g., Byrne, Griffitt, and Stefaniak, 1967), however, have never failed to find the hypothesized positive relationship between personality similarity and attraction and suggest that inconsistent results may be due solely to confounding inherent in correlational studies of natural groups.

Despite the differing vocabularies used, most of the similarity-attraction theories (e.g., Heider, 1946, 1958; Homans, 1950, 1961; Newcomb, 1956, 1961; Thibaut and Kelley, 1959) appear to have emphasized the hedonistic viewpoint that similarity produces attraction only because it provides pleasure to the interacting individuals. Heider (1958), for example, asserts that individuals are attracted to similar individuals only if their similarities are not disagreeable. Newcomb (1956) specifically states that similarity produces attraction only because "the likelihood of rewards of interaction with such persons is greater than with other persons (p. 576)." Homans (1961) and Thibaut and Kelley (1959) also suggest that similarity produces attraction only in those circumstances in which it is rewarding to the individuals.
In emphasizing reward, Thibaut and Kelley (1959) integrate need complementarity (Winch, 1955) and the similarity hypotheses by suggesting that in some cases complementary personalities will be more rewarding to each other than will similar personalities.

While the theories of Festinger and others under a cognitive dissonance orientation are not specifically concerned with interpersonal attraction, the prediction that attraction is greater for persons with similar rather than dissimilar attitudes is consistent with the dissonance approach, inasmuch as similar viewpoints may be considered to produce less dissonance and greater opportunity for precise social comparisons. This interpretation has been applied to a study of group cohesion (Festinger, 1954). The difference between this and other balance theories, such as those of Heider and Newcomb, may in large part be a matter of emphasis, but the emphasis is on dissonance which is put in opposition to a reward interpretation. That is, the dissonance approach prides itself on being able to predict "effects that tend to reverse those stemming from conventional hedonistic behavior theory (Brehm and Cohen, 1962, p. 159)," and the theory in general must be considered a clear exception to the viewpoint of the theories mentioned previously.

The viewpoint of Byrne and his associates is considered a reinforcement position, but in its emphasis on Festinger's concept of social comparison processes it may also constitute
an exception to the reward theories previously discussed. Interpreting the finding that personality similarity produces attraction, Byrne, Griffitt, and Stefaniak (1967) quote Festinger (1954) as follows: "To the extent that objective, non-social means are not available, people evaluate their opinions and abilities by comparison respectively with the opinions and abilities of others (p. 118)." On the basis of Festinger's further assertion that persons will be less comfortable in situations in which precise social comparisons are not available, Byrne et al. suggest that interpersonal attraction is a positive function of the degree to which the personality traits of individuals are alike. Similarly, Griffitt (1966) suggests that there is a learned drive to evaluate one's opinions and abilities and that "persons who are similar to oneself provide more precise comparisons than do those who are dissimilar, and the similarity functions as reward or reinforcement (p. 583)." Thus, these writers consider similarity a type of reinforcement which is not specifically limited to pleasurable similarities. The implication of their statements is that people who are alike are attracted to one another not because they value the traits which they hold in common but because each offers the other a precise comparison.

A question which arises from a consideration of similarity as reinforcement concerns the degree to which similarity may be independent of the pleasantness of the
traits involved. For example, will similarity of traits considered unpleasant by two interacting persons result in attraction? Or will dissimilarity of pleasant traits result in dislike? Some research is indirectly relevant to this issue and will be considered in the following. As this brief review will illustrate, comparison of research involving attraction is difficult since a wide variety of operational definitions of this concept have been used.

In attempt to separate acceptable from unacceptable self descriptions, Lundy, Katkovsky, Cromwell, and Shoemaker (1955) asked Ss to respond to MMPI items under instructions to describe themselves, their ideal selves, their most liked acquaintance, and their least liked acquaintance of the same sex. They found that ratings of a best friend were significantly more similar to S's acceptable self (i.e., same description for both self and ideal) than to S's unacceptable self, and that the opposite relationship held for a least liked acquaintance. While they concluded that the acceptability (or pleasantness) of traits, as well as similarity, contributed to attraction, they did not analyze the extent to which unpleasant self descriptions were correlated with the descriptions of one's best friend or the extent to which pleasant self-descriptions correlated with descriptions of a least liked acquaintance.

While popularity cannot be considered a personality trait, some studies involving this variable are relevant to
the present question inasmuch as similarity in popularity status has been found to be much more highly correlated with attraction for persons high than for those low in popularity. Newcomb (1956), for example, found that of fifteen Ss in a natural setting the three least popular persons liked each other even less than did the other members of the group. That is, despite similarity in popularity status, attraction was low and seem to be a function of the low level of desirable traits possessed by these Ss rather than their high degree of similarity. Homans (1961) and Riecken and Homans (1954) have also found greater attraction among high status pairs than low status pairs. It must be noted that attraction in these studies was examined in natural groups, and thus it is difficult to separate out the extent to which similarity for high status persons is associated with mutual friendship as opposed to attraction.

Newcomb (1956, 1961) has shown that attraction is a positive function of perceived agreement about one's personality traits not only for positive but also for negative traits. His measure of positive and negative traits and perceived similarity involved administration of the Gough (1955) checklist with instructions to describe one's self, one's ideal self, and one's self as S thought he was perceived by each of the others in the group. The inference from the results was that individuals are attracted to others whom they perceive as seeing their faults as well as their virtues. At
first glance this might seem to go against a reward interpre-
tation, since thinking well of an individual might seem
reinforcing while thinking poorly of him would not. However,
it also seems reasonable to view the ability to accurately
perceive the characteristics of another individual as a
positive personality trait which would produce attraction.

Griffitt (in press) has examined attraction as a function
of similarity to self-concept in studies which independently
manipulated similarity by varying the degree to which the
self-ratings of a "stranger" (actually a protocol faked by
E) were similar to those of S. The general finding was that
similarity produced attraction, which was measured by combined
ratings of probable general liking for the stranger and liking
to work with the stranger. Of relevance to the present ques-
tion is the finding that self-ideal discrepancy scores did
not influence the attraction measure. Two extreme groups of
Ss were used, those with high and those with low discrepancies
between self and ideal ratings. In terms of the present
conceptualizations of the reward value of a stranger, it
would be expected that those Ss with high self-ideal discrep-
ancies would be less attracted to persons similar to their
self descriptions than would those with low discrepancies.
In other words, following Heider (1958), individuals who feel
they have a large number of unpleasant characteristics should
not like persons similar to themselves. This expectation is
not supported; both high and low self ideal discrepancy Ss
produced equivalent attraction ratings of a similar stranger. It must be pointed out, however, that the variable examined here was a subject variable, and no separation was made within Ss between acceptable (i.e., pleasant) and unacceptable characteristics. It is impossible to tell the degree to which attraction was a function of those traits which were pleasant and similar versus those which were unpleasant and similar. In addition, it may be that ratings which included "liking to work with" may be measuring expected reciprocity of friendship or expected cooperation.

It appears that no research has been directed toward determining the degree to which the similarity-attraction relationship depends on the pleasantness of the traits involved. Nor has any finer-grain analysis been made of the extent to which similarity by itself is capable of functioning as a reinforcing stimulus when the pleasantness of the traits involved is held constant. While a number of reward theories have been discussed, none of them accounts for the development of the reinforcement value of words descriptive of persons nor the reinforcement value of the traits which these words describe. In the following chapter, some theoretical formulations based on Staats' (see Staats and Staats, 1963; Staats, 1968) conceptualizations of language development and function are directed toward this issue.
CHAPTER II
S-R LEARNING MODELS OF INTERPERSONAL ATTRACTION

In the last two decades or so concepts developed in the field of animal behavior have had an obvious impact on social psychological theorizing. The changes in the theoretical formulations of Homans (1950, 1961) and Newcomb (1943, 1961), for example, reflect the shift toward a learning terminology across this span of years. The relatively recent research and conceptualizations of Lott (1955), Lott and Lott (1960, 1965), Pepitone (1964), Scott (1957), and the researchers to be reviewed in this chapter also reflect the increasing emphasis on examination of traditionally social psychological problems from a learning point of view.

The concept of attitude, one of the cornerstones of social psychological investigation, has been a major object of reformulation in learning terms. A number of theorists, beginning with Doob (1947), have proposed that attitude be considered an implicit response, similar to the Hullian (1943, 1952) rg-sg mechanism. This response and accompanying internal cues are assumed to develop as a result of reinforcement and in turn to be capable of mediating a variety of overt human behaviors. Using a variation of this construct in their definition of word meaning, Osgood and Tannerbaum (1955) have further specified that the attitudinal component of this implicit response is measurable in terms of the evaluative
dimension of meaning.

Classical Conditioning Models of Attraction

Mowrer (1954) has made use of the concept of implicit responses in his suggestion that communication in language involves a process of classical conditioning. He illustrates this conception with the sentence Tom is a thief, in which he proposes that Tom functions as CS, the internal response to thief as UCR, and the newly established meaning response to the word Tom as CR. Staats has developed a method for testing Mowrer's conception which involves pairing visually presented CS words, such as nonsense syllables, with auditorily presented UCS words sharing a common dimension of meaning. For example, Staats and Staats (1957) concluded that meaning could be conditioned to nonsense syllables for the three main factors of meaning listed by Osgood and Suci (1955), the evaluative, potency, and activity factors.

Evaluative meaning as UCS. In theoretical formulations presented since the original conditioned meaning study, Staats (see Staats and Staats, 1963; Staats, 1968) has developed a theory of human behavior in which classical conditioning, as well as instrumental conditioning and discrimination learning are used to account for a broad range of complex human behaviors. Among these are behaviors related to concepts within the realm of social psychology, such as values, norms, group cohesion, goals, persuasion, imitation and conformity, status, social motive, self concept, and attitudes. Of
primary relevance to the present study is Staats' suggestion that attitudes are established by classical conditioning. Using Osgood and Suci's (1955) definition of attitude as measured by evaluative meaning, Staats and his associates have shown that attitudes can be conditioned to such verbal stimuli as nonsense syllables (Staats and Staats, 1957; Staats and Staats, 1959), meaningful words (Staats, Staats, and Biggs, 1958; Staats, Staats and Heard, 1959) and national and familiar masculine names (Staats and Staats, 1958).

The study involving conditioning of attitudes toward names illustrates the relevant paradigm and Staats' conception of the way in which interpersonal attraction occurs. In the second experiment of this study, described to Ss as a learning task, six common men's names were presented by means of a slide projector and paired with words of a particular evaluative meaning presented orally. Two of the names were consistently paired with words of either negative or positive evaluative meaning while the remaining four were presented with words of no systematic meaning. Following presentation of the stimuli Ss were asked to rate the six names on a seven-point evaluative scale (pleasant-unpleasant). With Ss aware of the relevant relationship eliminated from the analysis, the finding was that the names produced positive attitudes (attraction) when paired with positive evaluative words and negative attitudes when paired with negative words.
The process by which Staats suggests that attitudes toward names (and stimuli in general) develop is similar to the analysis presented by Mowrer. The name is considered a CS, the evaluative words UCS, and the evaluative response to the name a CR. While a number of responses other than those of evaluative meaning may be elicited by the different UCS words, including other meaning responses and in some circumstances instrumental responses, the only dimension systematically held constant for these words was the evaluative one. The process may then be considered a series of trials in which the evaluative response is the only one consistently elicited throughout.

Staats does not propose that the rating of the CS word is a CR but that it is an instrumental response mediated by the true CR, the internal (and possibly autonomic) evaluative response. This internal response is similar to that proposed by Doob (1957) and Osgood (1953) and has the status of a hypothetical construct, but some impressive evidence has been found which supports the notion of its existence and mediating function. Staats, Staats, and Crawford (1962), using a semantic conditioning type procedure, demonstrated that when a relatively neutral word (i.e., large) was paired with shock or noise, the magnitude of the GSR elicited by the word alone was correlated with its rating by Ss on an evaluative meaning scale. While this does not indicate that the GSR or autonomic responses associated with it caused the rating, the relationship between these variables does suggest that the two measures
may to some extent be measuring the same process. In a portion of another study which replicated this one, Maltzman, Raskin, Gould and Johnson (1965) found very similar results.

The conditioning of attitudes in the Staats and Staats (1958) study was to stimuli comprising common names, not to individuals represented by these names. Staats points out, however, that at least one study (Kapustnik, 1934) has shown that a response conditioned to a verbal sign generalized to the object represented by that sign. The explicit assumption of Mowrer's (1954) discussion of communication through conditioning is also that the meaning of (or attitude toward) the stimulus object, as well as the word which represents it, will change as a result of classical conditioning. Thus, the theory can justifiably be considered a theory of interpersonal attraction, although it has taken an atomistic approach in attempt to isolate the attraction response. It seems reasonable to suggest that the pairing of affective meaning words with any of the stimuli which make up part of the total stimulus configuration of an individual would to some extent produce change in attitude toward the whole individual.

Staats' theory unites under the same mechanism the development of word meaning, UCS value, and word function as conditioning agents. The evaluative meaning of the words used in the study under discussion, and of words in general, is conceived of by Staats as developing through the same process as that by which they transmit meaning to other
stimuli, the process of classical conditioning. Prior to language learning experiences, words are assumed to have no meaning for a child and may be considered to function as relatively neutral stimuli which come to elicit evaluative meaning as a result of being paired with pleasant or unpleasant events. It seems reasonable to expect, for example, that during a child's language development and later, words of positive evaluative meaning (e.g., gift, happy, vacation) occur under pleasant circumstances while words of negative evaluative meaning (e.g., vomit, bitter, ugly) occur under unpleasant circumstances. The actual events (receiving a gift, being happy, etc.) are assumed to function as UCS and eventually some portion of the response to them becomes conditioned as part of the meaning of words associated with them. In turn, when words are paired with other neutral stimuli, such as other words or persons, they become capable of producing evaluative responses to these stimuli. Thus, the conditioning of meaning studies can actually be considered higher order conditioning in which words originally functioning as CS now function as UCS.

Similarity as UCS. Byrne and Clore (in press) have presented a conditioning model of attraction which is similar to Staats' in many respects. To account for the similarity-attraction relationship, however, Byrne has used a separate category of this model in which similarity is thought to function as a special type of reinforcing event. The
reinforcing power of attitude similarity is assumed to derive from a learned drive for consensual validation. Part of the rationale for this point of view is summarized by Byrne and Clore (in press) as follows:

It is assumed that there is a learned drive (labeled "effectance motive") to be logical, to interpret the environment correctly, and to function effectively in understanding and predicting events (Byrne and Clore, 1967) . . . . It is for this reason that when another person expresses his attitudes, the similarity or dissimilarity of these statements relevant to one's own attitudes is directly related to the subsequent evaluation of that person.

The reinforcing power of personality similarity is assumed to derive from an individual's need for social comparisons (Festinger, 1954), as discussed in the previous chapter.

Similarity is assumed to produce attraction through an implicit mediating response similar to those previously discussed. While the theory does not clearly specify the way in which the reinforcing value of similarity is thought to develop, it has accurately predicted attraction in a variety of situations (e.g., Byrne, 1961, 1962; Byrne and Clore, 1966, 1967; Byrne, Clore, and Worche1, 1966; Byrne and Griffitt, 1966; Byrne and Nelson, 1964; Byrne and Rhamey, 1965; Byrne and Wong, 1962; Byrne, Young, and Griffitt, 1966; Griffitt, 1966, in press). The basic paradigm used in these studies may be illustrated by a study concerned with personality similarity (Byrne, Griffitt, and Stefaniak, 1967). Ss were first asked to describe themselves on a series of five-point
rating scales. They were then asked to review a "stranger's" responses to the same protocol and rate the degree that they would like and like to work with the stranger. The protocol was actually faked by E to manipulate the degree to which it was similar to S's protocol. The general finding was that the more similar were the two protocols the greater was the attraction of S for the stranger.

Comparison of the evaluation and similarity models. In general the paradigms used by Staats and Byrne are different, but some of the procedures used have been quite similar. For example, in a procedure like that used to produce conditioned meaning, Byrne (unpublished, discussed in Byrne and Clore, in press) has demonstrated that when attitude statements like those held by a particular subject were contiguously presented with photographs of another, unknown individual, the photographs came to evoke positive affective responses (as measured by evaluative scales of the semantic differential). Similarly, attitude statements dissimilar to those of S evoked negative affective responses.

While their views of what constitutes a UCS in attraction studies are different, both Staats and Byrne suggest that the CR produced may be characterized as ranging from pleasant to unpleasant. In addition, both suggest that words of a positive or negative UCS value in a classical conditioning situation should function as reinforcement and punishment in an instrumental task. This has been demonstrated by Golightly
and Byrne (1964) and Finley and Staats (1967) in studies in which one of two responses was followed by words or statements considered reinforcing while the other was followed by words or statements considered aversive. One of the studies used a procedure related to a concept formation task while the other involved left and right hand button pushing, but the main difference concerns the type of reinforcement used and reflects the theoretical differences between these researchers. In one case, reinforcement involved attitude statements either like or unlike those of the subject, while in the other case reinforcement involved words of either positive or negative evaluative meaning.

It seems apparent that both similarity and evaluation have accurately predicted UCS and reinforcement value in a number of studies. It may well be, however, that individuals consider most of their attitudes and personality traits to be good ones and that it is the evaluative meaning dimension rather than the similarity dimension which is responsible for conditioning. For example, the attitude statements accompanying the photographs may not only be similar to those of the subject but also may be considered pleasant by him. In the same way, the subject may consider traits of a stranger to be not only similar to his but pleasant. If, as this suggests, the similarity and evaluative dimensions are correlated for both attitudes and personality traits, interpretations in terms of either Byrne's or Staats' conceptualizations are
equally logical.

The two points of view are not in opposition, inasmuch as neither suggests that attraction is exclusively a function of either similarity or pleasantness. Staats' position has somewhat greater theoretical appeal, however, in terms of the potential it offers for a more detailed examination of the attraction phenomenon and its integration of attraction with language learning and other areas. For example, it accounts for the development of the UCS value of words in terms of a specific learning process; words occurring in language are thought to acquire their reinforcing power in the same manner that they produce it in other stimuli, through the process of classical conditioning. While Byrne suggests that similarity acquires its power as a result of learned drives for consensual validation and social comparison processes, he does not specify the way in which these drives are learned.

In Staats' view, then, words which function as UCS were previously CS during the individual's language learning experiences. Implicit in this position is the notion that only those factors transmitted to the CS can be further transmitted when it functions as UCS in higher order conditioning. Consider, for example, Osgood and Suci's (1955) three main factors of word meaning: evaluation, potency, and activity. If a word functioning as a CS were conditioned to elicit potency meaning, it seems reasonable to suggest that in its later function as an UCS it would be capable primarily of
conditioning potency meaning in another stimulus, rather than activity or evaluative meaning. In a sense, Byrne is suggesting that words measured on the similarity dimension (though not, of course, an established factor) are capable of conditioning meaning on the evaluative dimension. Whether or not similarity has this effect is an empirical question; but at first glance it seems an unlikely notion.

With regard to the capacity of these variables to reinforce an instrumental response, evaluative meaning as a measure of pleasantness fits a loosely conceived notion of the law of effect. This is not to suggest a return to the strictly hedonistic interpretations of reinforcement in terms of pleasure or pain produced, since these refer to the private experiences of the organism which are not subject to investigation. Nonetheless, verbal report is an accepted behavioral measure with human organisms, and it should be possible to determine the extent to which ratings of pleasurableness coincide with reinforcement power. This has been examined, in fact, in studies of electrical stimulation of the so-called reward centers of the brain in which introspective reports of patients indicate pleasure or satisfaction (Heath and Mickle, 1960). This suggests that the original connotations of the law of effect may not have been so erroneous, and that a measure of reinforcers in terms of pleasantness may be at least more reasonable than one involving similarity. The present study, which involves UCS value as a function of
ratings on these dimensions, will reflect on this question.

Byrne suggests that the reinforcing value of similarity derives from learned drives for consensual validation and social comparison. Implicit in this conception is the notion that similarity contains a mediating reaction which may function as either a conditioned reinforcer or a higher order UCS. It may well be that social reinforcers occur most frequently in the presence of agreement, similarity of attitudes, personality, behavior, etc. of two individuals. If this is the case, similarity between two individuals would become a secondary reinforcer; and if deprivation of such similarity would increase its reinforcing value the definition of similarity-seeking as a learned drive would be satisfied.

If such an analysis is found to be correct, however, it would still require a further step to explain why the reinforcing value of similarity would not be accounted for by its evaluative meaning. When similar self-descriptions, attitudes, etc. are accompanied by reinforcement, the positive evaluative meaning of the language used should increase and when not it should not. If two people describe themselves, for example, as obnoxious and this similarity in trait were not followed by pleasant interaction, it would seem unreasonable to expect the word on future occasions to elicit either attraction or positive evaluative meaning. In other words, as previously suggested, the reinforcing value of similarity may be entirely dependent on its having occurred contiguously with reinforcement, and
those aspects of similarity independent of evaluative meaning may have no capacity to elicit a conditioned attraction response.

Statement of the Problem

Both Byrne and Clore (in press) and Staats (1958) have presented classical conditioning models of interpersonal attraction in which the person functions as a CS, some category of reinforcing event as UCS, and attraction as a CR. In explanation of the social psychological finding that similarity of attitude and personality traits results in attraction, Byrne has proposed a separate category of this model in which similarity functions as a UCS.

The thesis of the present study is that similarity and evaluative meaning are correlated and that similarity of personality traits, and the words used to describe these traits, have reinforcing power only to the extent that they also have positive evaluative meaning. The strategy of the present study is to examine the basic UCS value of these variables in a simple conditioning setting involving conditioning of attitudes toward trigrams. It is proposed that if evaluation and similarity are held constant across levels of each other, evaluation will be the sole predictor of UCS value.

Figure 1 illustrates the problem of the present study and the predictions which might be made by the two systems under consideration. In this example, S has rated the words
A. Meaning of the UCS words.

<table>
<thead>
<tr>
<th>Words</th>
<th>Evaluation</th>
<th>Similarity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happy</td>
<td>PLEASANT (+)</td>
<td>LIKE ME (L)</td>
</tr>
<tr>
<td>Witty</td>
<td>PLEASANT (+)</td>
<td>UNLIKE ME (U)</td>
</tr>
<tr>
<td>Lonely</td>
<td>PNPLEASANT (-)</td>
<td>LIKE ME (L)</td>
</tr>
<tr>
<td>Selfish</td>
<td>UNPLEASANT (-)</td>
<td>UNLIKE ME (U)</td>
</tr>
</tbody>
</table>

B. The conditioning process.

CS     UCS     \( R \) predicted by:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Byrne</th>
<th>Staats</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAPPY  (+L)</td>
<td></td>
<td>( r_{m+}^{++} )</td>
<td>( r_{m+} )</td>
</tr>
<tr>
<td>YOF----</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WITTY  (+U)</td>
<td></td>
<td>( r_{m+}^{--} )</td>
<td>( r_{m+} )</td>
</tr>
<tr>
<td>LAJ----</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LONELY (-L)</td>
<td></td>
<td>( r_{m-}^{--} )</td>
<td>( r_{m-} )</td>
</tr>
<tr>
<td>XEH----</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SELFISH (-U)</td>
<td></td>
<td>( r_{m-}^{--} )</td>
<td>( r_{m-} )</td>
</tr>
<tr>
<td>WUH----</td>
<td></td>
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</tbody>
</table>

C. Example of CS ratings on the evaluative scale which might be predicted from the two systems.

<table>
<thead>
<tr>
<th></th>
<th>Byrne</th>
<th>Staats</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pleasant</td>
<td>unpleasant</td>
</tr>
<tr>
<td>like</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>unlike</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

Figure 1. Possible predictions of conditioned attraction from the two conceptual schemas under consideration. (See text for explanation of the figure.)
both in terms of their pleasantness (+ or -) and the degree
to which they are descriptive of him (L or U), as shown in
part A. Part B shows the responses to these words which might
be predicted by Byrne and Staats. The word happy, for example,
is both pleasant and like me and would be expected to elicit
positive evaluative meaning (r_m+ or r_m++) under both systems.
The two plus signs following the response under the column
labeled Byrne indicate that an additional element of positive
evaluative meaning has been added due to the similarity of
the word to S. Witty is pleasant but unlike me, and these
dimensions might be expected to neutralize each other under
Byrne's system, since one would produce positive and the
other negative evaluative meaning (r_m+-). The expectation
from Staats' position would be that the similarity element
would not change the evaluative response, and thus the
response to the first and second words is the same (r_m+).
The predicted responses to the last two words follow the same
logic as that just presented; under Byrne's system, the
prediction is that similarity would increase the pleasantness
of a negative word, while under Staats' system the prediction
is that it would have no effect.

Prior to conditioning, the UCS words would be expected
to elicit meaning responses while the neutral stimulus words,
the trigrams, would not. This is illustrated by the solid
lines which connect the UCS words with the responses and the
dashed lines which connect the trigrams and responses.
Following conditioning, the establishment of the trigram as a CR would be represented by changing the dashed line to a solid line.

In part C, possible ratings of the trigrams after conditioning are shown. The numbers are representative of ratings made on a seven point evaluative scale, with 1 being most pleasant, 7 most unpleasant, and 4 neutral. The ratings shown are not intended to be precise predictions of the outcome in the present study but merely to reflect the order of results which might be expected on the basis of the two positions under consideration. Under Byrne's system the expectation would be that the unlike me cells would show less positive meaning than the like me cells for those pairs of cells in which evaluative meaning is the same. Under Staats' system the expectation would be that there would be no difference between like me and unlike me cells across each level of evaluative meaning.
Subjects

Seventy students enrolled in graduate courses in education and thirty-four students enrolled in introductory psychology courses at the University of Hawaii were pretested (in groups ranging from seven to thirty-five students) on a 121 item word-rating scale. Of these 104 students, 38 fit the selection criterion (described below) and 24 were available to participate in the conditioning procedure. Eight of these were eliminated because of awareness, leaving a total of sixteen Ss from whom data were taken.

Of the 16 Ss thus selected, 13 were graduate students in education, primarily grade school and high school teachers obtaining graduate credit during the summer. Twelve of these thirteen were females. The remaining Ss were undergraduates, two males and one female.

The graduate students were volunteers and received no compensation for participation. The undergraduates were also volunteers but received points which contributed to the final grade in the course from which they were solicited.

Materials

The pretest booklet consisted of 121 adjectives selected from Anderson's (1964) list of 555 adjectives. Words were randomly assigned to 11 pages, and the same randomization was
used for all subjects. The words to be rated were placed in a column down the center of each page with 11 words per page. Beneath each word were two seven-point scales, the evaluation scale ranging from pleasant to unpleasant and the similarity scale ranging from like me to unlike me. Part of a page from the pre-test booklet is shown in Figure 2.

General instructions on the cover sheet of the booklet were similar to those used by Osgood (in Osgood, Suci, & Tannenbaum, 1957) and are included in the Appendix. The scales were arranged with the same polarity throughout (pleasant-unpleasant, like me-unlike me) to avoid confusion on the part of the subject, and the two scales always occurred in the same order (evaluation followed by similarity) as in the sample in Figure 2.

For use as CS words during the conditioning procedure, twelve black and white transparent slides were made of each of four CVC trigrams (YOF, XEH, LAJ, and WUH). The 48 slides were of upper case letters centered within each frame which, when projected, produced a white figure on a dark background.

Selection of UCS Words and Subjects

Subjects were selected to participate in the conditioning phase only if their responses to the protocol met the following criterion. Each protocol to be used had to produce four lists of twelve words per list which were rated by the subjects as follows:

List 1: Words rated as pleasant and like S.
CYNICAL

pleasant___:___:___:___:___:___:___:___unpleasant
like me___:___:___:___:___:___:___:___unlike me

SOPHISTICATED

pleasant___:___:___:___:___:___:___:___unpleasant
like me___:___:___:___:___:___:___:___unlike me

RELIGIOUS

pleasant___:___:___:___:___:___:___:___unpleasant
like me___:___:___:___:___:___:___:___unlike me

SYMPATHETIC

pleasant___:___:___:___:___:___:___:___unpleasant
like me___:___:___:___:___:___:___:___unlike me

NEUROTIC

pleasant___:___:___:___:___:___:___:___unpleasant
like me___:___:___:___:___:___:___:___unlike me

UNINDUSTRIOUS

pleasant___:___:___:___:___:___:___:___unpleasant
like me___:___:___:___:___:___:___:___unlike me

AGGRESSIVE

pleasant___:___:___:___:___:___:___:___unpleasant
like me___:___:___:___:___:___:___:___unlike me

Figure 2. Part of a page from the pre-test booklet.
List 2: Words rated as pleasant but unlike S.
List 3: Words rated as unpleasant but like S.
List 4: Words rated as unpleasant and unlike S.

The seven points of the rating scales were assigned numbers ranging from 1 (pleasant for the evaluation scale, like me for the similarity scale) to 7 (unpleasant or unlike me). For the four lists, ratings of 1, 2, or 3 were considered pleasant or like me and ratings of 5, 6, or 7 were considered unpleasant or unlike me. Occasionally ratings of 4 (neutral) were used on one of the two dimensions to complete the list of 12 items.

The design used was a repeated measures design in which it was desired that each of the main factors (evaluation and similarity) be held constant across each of the two levels (high and low) of the other factor. As shown in Table 1, the mean evaluation and similarity ratings of the lists were quite close across the appropriate levels. Multiple sign tests indicated that the differences between the distributions of the four pairs were not statistically significant (p > .05).

Procedure

Since part of the main hypothesis of this study implies that evaluation and similarity are correlated, a correlation between these dimensions was calculated. Twenty booklets were randomly selected from the entire group of booklets, the mean ratings on the two scales for each of the 121 words was determined, and a single correlation between these mean
<table>
<thead>
<tr>
<th>Evaluation Ratings</th>
<th>Pleasant</th>
<th>Unpleasant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Like me</td>
<td>1.64</td>
<td>6.43</td>
</tr>
<tr>
<td>Unlike me</td>
<td>1.66</td>
<td>6.37</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Similarity Ratings</th>
<th>Pleasant</th>
<th>Unpleasant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Like me</td>
<td>2.28</td>
<td>2.31</td>
</tr>
<tr>
<td>Unlike me</td>
<td>5.48</td>
<td>5.69</td>
</tr>
</tbody>
</table>

Note: The upper portion of the table shows mean evaluation ratings across the two levels of similarity, and the lower portion shows mean similarity ratings across the two levels of evaluation.
ratings was computed.

Ss were contacted again between five and ten days following the pre-test. They had previously been told that they would be asked to participate in a second experiment, and this experiment was now described to them as a learning task. An appointment was made and Ss were told the location of the experimental room.

The experimental room was a classroom at the front of which was a slide projector on a table. E and S sat at either side of the table facing the rear wall, with S seated slightly in front of E. The projector was thus located between them and directed toward the rear wall.

S was handed a nine-page booklet and told to read the instructions on the first page, which were as follows:

LEARNING AS A FUNCTION OF MEANING TO THE INDIVIDUAL AND TYPE OF PRESENTATION OF STIMULI

In the present study we wish to examine the way you learn words as a function of what they mean to you. In addition, we wish to examine the effects of visual versus oral presentation of these words.

Two types of words will be used. One list of nonsense syllables will be presented by means of a slide projector, and a second list of meaningful words will be presented orally. Your task is to learn to recognize, not recall, the two different lists of words presented in these different ways.

Please pay close attention, but relax and do not use any special "tricks" to aid your memory. We are more interested in what you learn when you aren't trying so hard.

Pay close attention to each nonsense syllable as it appears on the screen. When the experimenter says a word, repeat it after him.
The 48 slides were presented in a counterbalanced sequence so that each of the trigrams occurred once in each block of four slides. No trigram occurred more than once in a row. The projector was set so that each slide would automatically be shown for five seconds with a five second interval between slides.

Approximately one second after the onset of each trigram the UCS words were spoken by E and then repeated aloud by S. All 12 adjectives comprising a particular list were consistently paired with only one of the four trigrams. Figure 2 illustrates the counterbalanced sequence of trigram presentation, with UCS words taken from an actual S. To control for possible differences between trigrams, each trigram was paired equally often with each of the four lists of adjectives across the 16 Ss.

Following presentation of all 48 trigrams and adjectives S was told to turn to page two of his booklet. On this page was printed the following statement, which E read aloud:

We have said that word meaning--the way you feel about words--influences the way you learn them. Nonsense syllables, like real words, can be rated for what they mean to you. On the following sheets of paper, please indicate the way you feel about the nonsense syllables by checking the degree of pleasantness or unpleasantness of each syllable.

On each of the four pages following this statement was printed one of the trigrams, beneath which was a single 7-point rating scale ranging from pleasant to unpleasant. The four pages were randomly collated for each S. After S
1. YOF forgetful                        25. WUH cheerful
2. XEH pleasant                        26. XEH sympathetic
3. WUH experienced                     27. LAJ radical
4. LAJ absent-minded                   28. YOF sensitive
5. WUH intelligent                     29. XEH popular
6. LAJ lonely                          30. WUH cooperative
7. YOF talkative                       31. YOF negligent
8. XBH unselfish                       32. LAJ outspoken
9. LAJ authoritative                   33. XEH reliable
10. WUH adventurous                     34. LAJ rebellious
11. XEH considerate                    35. WUH creative
12. YOF inhibited                       36. YOF clumsy
13. XEH moralistic                     37. LAJ argumentative
14. YOF frustrated                     38. XEH dignified
15. LAJ neurotic                        39. YOF careless
16. WUH happy                           40. WUH ambitious
17. YOF unwise                          41. YOF obnoxious
18. LAJ tactless                        42. WUH educated
19. XEH sophisticated                  43. LAJ irreligious
20. WUH witty                           44. XEH vivacious
21. LAJ angry                           45. WUH progressive
22. YOF unhappy                         46. YOF sly
23. WUH proud                           47. XEH suave
24. XEH religious                       48. LAJ dissatisfied

Figure 3. One of the orders of trigram presentation, with UCS words from an actual S. For this S, WUH was paired with words from List 1 (pleasant, like me), XEH with List 2 (pleasant, unlike me), LAJ with List 3 (unpleasant, like me), and YOF with List 4 (unpleasant, unlike me).
indicated that he had finished rating the syllables he was asked to turn the page and place a check-mark next to those syllables he remembered seeing, and following this he was asked to check those adjectives which he remembered hearing.

As an indication of awareness, S was then asked to turn to the last page and read the printed statement. E read it aloud. The statement was as follows:

Finally, please write on the back of this page any thoughts which occurred to you during the course of the experiment which might be relevant, particularly regarding the purpose of the experiment.

Following this S was thanked for participating and the session was terminated.

Those Ss who, in response to this question, indicated that pleasant or unpleasant words (or words of a particular feeling) had been associated with the trigrams were eliminated as Ss. Eight of the Ss were eliminated on this basis. To preserve the counterbalanced design, each time an S was judged aware additional Ss were run until the blocks were complete. None of the Ss indicated awareness of the similarity dimension, that the trigrams had also been paired with adjectives which were like them or unlike them.

Sequence of trigram presentation. A pilot study had suggested that conditioning might not be equivalent for all four trigrams used. YOF had conditioned both more positively and more negatively than the other trigrams when paired with appropriate UCS adjectives. To account for this, the
possibility was entertained that the apparent differential conditioning of the trigrams might be a function of the particular randomized sequence selected for presenting them. That is, YOF had occurred more frequently than the other trigrams in the first half of the list and was also the only trigram to occur twice in a row in the first half. In an attempt to insure more uniform conditioning, the present study presented the 48 slides in counterbalanced rather than randomized sequences so that each of the trigrams occurred once in each block of four slides with no slide occurring more than once in a row.

As a further partial control for order of presentation effects, two such counterbalanced sequences of trigrams were devised. The sequence for the first list was determined by arranging the four trigrams in three 4 x 4 latin squares, with the order of presentation being determined by the sequence of trigrams across rows. Figure 3 shows this sequence. The second sequence was determined by substituting trigrams for each other within the same latin squares. Ss were run in two blocks of eight with each block assigned to one of the two sequences.

Counterbalancing of trigram-adjective pairings. As mentioned, counterbalancing of possible differences between trigrams was achieved by pairing each trigram equally often with each of the four lists of adjectives across the 16 Ss. That is, for four Ss YOF was paired with pleasant-like me
words, for four other Ss with pleasant-unlike me words, and so forth through the four lists of words and the four trigrams. The actual assigning of trigrams to adjective lists for each S was accomplished by selecting two 4 x 4 latin squares of the four trigrams and arranging these in four columns of eight, as shown in Figure 4. Each column was then designated to be paired with one of the adjective lists, and two Ss were assigned each of the eight rows.
<table>
<thead>
<tr>
<th>Ss</th>
<th>Pleasant Like me</th>
<th>Pleasant Unlike me</th>
<th>Unpleasant Like me</th>
<th>Unpleasant Unlike me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 9</td>
<td>YOF</td>
<td>XEH</td>
<td>WUH</td>
<td>LAJ</td>
</tr>
<tr>
<td>2, 10</td>
<td>WUH</td>
<td>LAJ</td>
<td>YOF</td>
<td>XEH</td>
</tr>
<tr>
<td>3, 11</td>
<td>LAJ</td>
<td>WUH</td>
<td>XEH</td>
<td>YOF</td>
</tr>
<tr>
<td>4, 12</td>
<td>XEH</td>
<td>YOF</td>
<td>LAJ</td>
<td>WUH</td>
</tr>
<tr>
<td>5, 13</td>
<td>XEH</td>
<td>YOF</td>
<td>WUH</td>
<td>LAJ</td>
</tr>
<tr>
<td>6, 14</td>
<td>YOF</td>
<td>XEH</td>
<td>LAJ</td>
<td>WUH</td>
</tr>
<tr>
<td>7, 15</td>
<td>LAJ</td>
<td>WUH</td>
<td>YOF</td>
<td>XEH</td>
</tr>
<tr>
<td>8, 16</td>
<td>WUH</td>
<td>LAJ</td>
<td>XEH</td>
<td>YOF</td>
</tr>
</tbody>
</table>

Figure 4. Assignment of trigram and adjective list combinations to Ss.
CHAPTER IV
RESULTS

From twenty booklets randomly selected from the entire group of booklets, the mean ratings on the two scales for each of the 121 words was determined and a single correlation between these mean ratings was computed. The correlation between the mean evaluation and similarity ratings of these words was found to be .841.

Table II presents the mean ratings of the CS trigrams following pairing with each of the four UCS adjective lists. Each of these means is based on the same 16 Ss and includes four ratings of each of the four trigrams. With reference to only the two main factors represented in this table (evaluation and similarity) the design is a 2 x 2 repeated measures design.

Summing over levels of these two variables produces mean values which are quite close for the similarity factor and relatively far apart for the evaluative factor. The two means representing the levels of similarity are also relatively close to the "neutral" rank of four, while those for evaluation are in the expected directions above and below four.

In the analysis of variance, presented in Table III, the F for evaluation is highly significant (p < .005) while that for similarity is not (p > .20). The similarity by evaluation interaction is also not significant but a tendency toward interaction is evident (p < .10).
TABLE II
MEAN RATINGS OF SYLLABLES PER CONDITION
FOR Ss JUDGED UNAWARE

<table>
<thead>
<tr>
<th>Similarity</th>
<th>Evaluation</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pleasant</td>
<td>Unpleasant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like me</td>
<td>3.56</td>
<td>4.06</td>
<td></td>
<td>3.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unlike me</td>
<td>2.88</td>
<td>5.00</td>
<td></td>
<td>3.94</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\( \bar{X} \)

Evaluative        3.22       4.53    3.88

Total             3.88
TABLE III
ANALYSIS OF VARIANCE OF CONDITIONING SCORES

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation (A)</td>
<td>1</td>
<td>31.64</td>
<td>13.70**</td>
</tr>
<tr>
<td>Similarity (B)</td>
<td>1</td>
<td>0.05</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AB</td>
<td>1</td>
<td>8.23</td>
<td>3.43</td>
</tr>
<tr>
<td>AS</td>
<td>15</td>
<td>2.31</td>
<td></td>
</tr>
<tr>
<td>BS</td>
<td>15</td>
<td>4.54</td>
<td></td>
</tr>
<tr>
<td>ABS</td>
<td>15</td>
<td>2.40</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p < .005
<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation (A)</td>
<td>1</td>
<td>31.64</td>
<td>10.58**</td>
</tr>
<tr>
<td>Similarity (B)</td>
<td>1</td>
<td>.05</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Trigrams (C)</td>
<td>3</td>
<td>4.47</td>
<td>1.49</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AB</td>
<td>1</td>
<td>8.23</td>
<td>2.75</td>
</tr>
<tr>
<td>Residual</td>
<td>42</td>
<td>2.99</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p < .005"
For the purpose of examining differences between ratings of trigrams the three error terms were combined and three degrees of freedom were separated out for trigrams as a third factor. Using the common residual error term, the F for evaluation is again significant (p < .005) and the F for similarity is not (p > .20). The F for trigrams is also not significant (p > .20). As a result of an increased error term, the trend toward similarity by evaluation interaction decreased (p > .10).

Comparison of data from Ss judged aware versus those judged unaware reveals some fairly consistent differences between these two groups. While no formal statistical comparison can be carried out due to lack of counterbalancing of trigrams for aware Ss, it is interesting to note that four of the eight aware Ss used extreme ratings of 1 or 2 for the pleasant words and 6 or 7 for the unpleasant. None of the unaware Ss used such extreme ratings for all four words. In addition, for none of the eight aware Ss was a trigram which had been paired with pleasant adjectives rated unpleasant (i.e., greater than 4) nor a trigram which had been paired with unpleasant adjectives rated pleasant (less than 4). Only three of the sixteen unaware Ss, on the other hand, exhibited this consistency, and one of these gave three of the trigrams a rating of 4.

The mean ratings of the trigrams per condition for the aware Ss, shown in Table V, reflect the same trends apparent
<table>
<thead>
<tr>
<th>Similarity</th>
<th>Evaluation</th>
<th>Similarity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pleasant</td>
<td>Unpleasant</td>
</tr>
<tr>
<td>Like me</td>
<td>2.00</td>
<td>5.38</td>
</tr>
<tr>
<td>Unlike me</td>
<td>1.38</td>
<td>6.38</td>
</tr>
<tr>
<td>Evaluative</td>
<td>1.69</td>
<td>5.88</td>
</tr>
<tr>
<td><em>X Total</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
in the date of the unaware Ss. The difference between levels of the evaluative dimension, however, is greatly increased. In addition, the same tendency toward interaction exists, with the order of magnitude of the cell means identical to that in Table II.

Despite the insignificant $F$ for trigrams shown in Table IV, it is not safe to assume that there is no trigram effect for the sample of aware Ss. Nonetheless, if the magnitude of the ratings of trigrams for the unaware Ss were assumed to apply to the aware Ss this could not account for the direction of difference between the pleasant-like me and pleasant-unlike me cells, since the previously obtained ratings of most of the trigrams represented in these cells were in the opposite direction.

While the presence of the large difference between levels of the evaluative factor could be considered as due to "awareness," the apparent interaction between levels of the similarity dimension probably could not. None of the Ss indicated awareness of the fact that the adjectives also varied on the similarity dimension. Under the present operational definition of awareness, any differences between the levels of similarity and the occurrence of a similarity by evaluation interaction could not be attributed to awareness.
CHAPTER V
DISCUSSION

While the similarity dimension has accurately assessed the reinforcement value of words in a number of studies, the thesis of the present study is that its predictive power may be entirely a function of the fact that it is a correlate of evaluative meaning. Thus, it was hypothesized that the similarity and evaluation measures of personality traits used in the present study would be correlated, and this prediction was found to be correct. A second prediction, which comprised the main hypothesis of the study, was that evaluative meaning would be the sole gauge of the UCS value of words in the conditioning of attitudes toward trigrams. This hypothesis was also supported. When the two variables were held constant across levels of each other, it was found that evaluation accurately reflected the power of adjectives to condition trigrams while similarity did not.

These results add support to Staats' conceptualizations regarding language development and function. Under Staats' system, the process of classical conditioning is used to account not only for the function of words in higher order conditioning but also for the development of their original meaning. Implicit in this conception is the notion that words can function as higher order conditioners only with regard to those dimensions of meaning which they possess. It would be expected, then, that words which possess "similarity"
meaning could not condition evaluative meaning, and this expectation is fulfilled.

As the above implies, the present finding also supports Staats' view regarding the relationship between interpersonal attraction and language formation. That is, attraction can be considered a meaning response which is measurable on the evaluative dimension of meaning. The difference between attraction and other meaning responses, then, is not related to the type of event which functions as UCS but to the type of CS. In conditioning the meaning of a word, a word functions as the CS; in producing attraction, an individual is the CS. In both cases the UCS is measurable in terms of evaluative meaning, and the additional conception that similarity functions as a UCS in conditioning meaning responses toward human beings is not needed.

As mentioned in Chapter II, the more hedonistic conception of reinforcement in instrumental conditioning as pleasant has somewhat greater theoretical appeal and also coincides with subjects descriptions of electrical stimulation of the "reinforcement centers" of the brain (Heath and Mickle, 1960). Since the present results indicate that similarity does not condition positive attitudes toward trigrams, it is consistent with Staats' conceptions to suggest that it would not function as a reinforcer in an instrumental task. It is suggested that the question of the instrumental reinforcing properties of similarity be examined in a further study.
Frequency of Word Usage and Evaluative Meaning

While the conclusion that evaluative meaning is the true causal factor in determining reinforcement value of words would be desirable, in terms of fitting the theory, this cannot be the unquestioned conclusion of the present study. The conclusion that may safely be reached is that the evaluative scale accurately predicts UCS value and that similarity ratings do not contribute to this prediction. It is obvious that in manipulating evaluation one may also be manipulating variables correlated with this dimension, such as similarity, word length, frequency of occurrence in English, pronouncibility, association value, meaningfulness, etc. Thus, it would be possible to say, for example, that a correlate of pleasantness such as frequency were the true causal factor and that evaluation is not.

It would be difficult to control for all of the variables, listed above in a single study, and even if this were possible it would still not give one assurance that some as yet unknown correlate of evaluative meaning were the true determining variable. As the present study examined one potential alternative explanation, however, that involving similarity, future studies could examine the effects of other alternative explanations, beginning with the most reasonable.

Studies reported in a recent article by Zajonc (1968) suggest that the variable of frequency is such a reasonable alternative explanation. Zajonc examines the somewhat novel
hypothesis that mere repeated exposure of words enhances their positive affective charge. In support of this thesis, he reports abundant evidence of a correlation between positive evaluative meaning and frequency of occurrence of words, not only in English but also in Spanish, French, and German. In addition to this correlational data, he also presents evidence from his own and previous research (Johnson, Thomson, and Frincke, 1960) in which frequency of exposure of words was experimentally manipulated. The finding was that the more frequently such stimuli as nonsense words and symbols were exposed, the greater was the favorability rating on an evaluative meaning scale (good-bad). That such a phenomenon may have relevance for interpersonal attraction was indicated in an additional study in which "likeability" ratings of persons depicted in photographs were found to be a function of number of exposures of these photographs.

The conclusion of Zajonc's paper, that frequency of exposure influences evaluative meaning, cannot be questioned on methodological grounds since frequency was independently manipulated. This does not mean, nor does Zajonc suggest, that stimuli become pleasant only as a function of repetition or that words which comprise an actual language become pleasant as a result of being frequently used. As Jakobovits (1968) points out in the same monograph supplement, it is at least as reasonable to suggest that words are used more frequently because they are pleasant as to assume the opposite causal
relationship.

Data from the present study concerning rated pleasantness and frequency of occurrence in English are consistent with Zajonc's findings. Following completion of the study, the mean frequency scores of the 24 pleasant and 24 unpleasant words used as UCS for each S were determined, with the similarity variable ignored. The frequency list used was the Thorndike-Lorge (1944) L-count.¹ It was found that the mean frequency value of the pleasant words was consistently higher than the mean frequency value of unpleasant words for all 16 Ss. Thus, a sign test indicated that the pleasant words used in this study had clearly significantly higher frequencies of occurrence in English than did the unpleasant words. It is possible, then, to view frequency as an alternative explanation of conditioning in the present study.

While it may or may not be that the frequency variable influences the degree of conditioning which occurs on the evaluative dimension, other studies indicate that it cannot serve as an alternative explanation of the occurrence of conditioning of meaning per se. In the original conditioning of meaning study (Staats and Staats, 1957) trigrams were conditioned in three separate experiments on the three factors of evaluative, activity, and potency meaning. The present

¹ No specific frequency information was available for some of the adjective forms and for some hyphenated words, and these words were not included in the computations.
writer examined the words used in these studies for their frequency of occurrence in English and found, as might be expected, that pleasant words occurred more frequently than did unpleasant words. For the trigrams conditioned on the activity factor, however, it was found that the mean frequency of the passive words did not differ from that of the active words (t < 1, p > .40). In effect, frequency was held constant but conditioning of active meaning was found to occur.

The Trend toward Similarity by Evaluation Interaction

The results indicate that the similarity by evaluation interaction was not significant. Nonetheless, the occurrence of the same trend toward interaction among Ss judged aware urges caution in rejecting such a factor. Not only are the magnitudes of the mean ratings in each cell in exactly the same order for aware as unaware Ss, but the differences between cells across the similarity dimension are of quite similar magnitude.

If such a trend actually reflects a true interaction, it would be difficult to account for in terms of either of the theoretical systems under consideration here or alternative explanations. Taken at face value, the interaction indicates that for words of positive evaluative meaning, the additional element of high similarity produces more negative ratings than does low similarity while for words of negative evaluative meaning, high similarity produces more positive ratings. While one of these relationships is consistent with expectations from research on similarity, the other is in the
opposite direction. An analysis in terms of frequency of occurrence in English reveals the same inconsistency. Nor could the interaction be attributed to awareness, under its present operational definition, since none of the Ss indicated awareness of the similarity dimension. For that matter, it would be difficult to suggest what they would be aware of, since the interaction was entirely unanticipated.

Looking at the interaction in another way, however, reveals a consistency which is at least more easily expressed. Across both levels of evaluation, adjectives rated unlike me produce more extreme scores than those rated like me, with both like me scores occurring closer to the neutral point of four. This suggests the interpretation that words which are unlike an individual produce more extreme conditioning, in both a positive and negative direction, than words which are like him.

While any attempt at explanation of this relationship must be highly speculative, it is suggested that this result may be a function of the type of population selected. Altrocchi, Parsons, and Dickoff (1960) have shown that persons described as sensitizers have larger self-ideal discrepancies than do repressors. Since the evaluative meaning scale used in this study is somewhat similar to an "ideal self" scale, it seems reasonable to suggest that persons who describe themselves as unlike words they consider pleasant or like words they consider unpleasant would also have high self-ideal
discrepancy scores. Since this study required persons who rated some proportion of the words in this way, and since only approximately 40 percent of persons pre-tested fit this criterion, it seems reasonable to conclude that the sample chosen included more "sensitizers" than "repressors".

Further, since a number of studies have shown that sensitizers tend to verbalize more anxiety in threatening situations (Layarus and Alfert, 1964; Lomont, 1965), the present sample may be more anxious or threatened by the experimental situation of the present study. Despite the instructions to Ss the pretest may well have appeared to be a personality inventory; many of the Ss expressed concern when they were contacted prior to the second part of the study. Many of them also appeared convinced that even the conditioning portion was a clinical or personality type of study which might help them in some way they did not understand.

If Ss selected were sensitizers and did have some sort of evaluation anxiety regarding the experiment, it may be reasonable to suppose that they were made more anxious by words which were not descriptive of themselves. That is, if they were anxious about some imminent evaluation to be made of their "selves", words descriptive of their "selves" may have produced more anxiety. If this is so, anxiety might have the status of an external exhibitor and reduce the amount of conditioning for the category of like me words.

The measurement of anxiety is, of course, complex, and
its effects on learning situations are by no means consistent. One study which is similar to the present one, however, suggests that anxiety may interfere with conditioning. Raskin (1963) has shown in a semantic conditioning study that for Ss unaware of the contingency, high anxious Ss tend to show less conditioning than do low anxious Ss. This study covers only one end of the pleasant-unpleasant continuum, however, and the feasibility of the present speculations must rest with a future study.

If the tendency toward interaction represents a true phenomenon, it may be that it has nothing whatsoever to do with personality but represents an artifact resulting from the procedure used. In responding to the pretest Ss, first rated the evaluation and then the similarity of the same word. This was done to prevent confusion on the part of the Ss and provide them with a set which would speed their ratings of the 121 words. This procedure, however, may have lessened the extent to which the ratings were independent of each other. While it would be difficult to suggest why this might be the case, it may be that Ss were less accurate in assessing the evaluative meaning of words which they considered descriptive of themselves than words not descriptive of themselves.

Comparison of Aware and Unaware Ss

The present study had a much higher proportion of aware Ss than other studies of conditioned meaning have had. This may have been due to the instructions used (see appendix) or
the fact that most Ss were graduate students. Whatever its source, however, the increased proportion of awareness allowed a comparison between aware and unaware Ss which produced what appear to be consistent behavioral differences between these two groups. In the following these differences and their relation to the "awareness problem" are discussed, along with a suggestion for a more conservative procedure for assessing awareness.

The question of "awareness" has been an issue since the first verbal operant conditioning study (Greenspoon, 1955). It has been inherited by modern semantic conditioning and generalization studies (e.g., Maltzman and Raskin, 1965) and by research on conditioning of meaning (Cohen, 1964). The issue, briefly stated, is this: if Ss are aware of the contingencies in an experiment, this serves as a confounding variable and an alternative explanation of the results. In relation to the present study, the awareness of Ss that pleasant adjectives are paired with some trigrams while unpleasant adjectives are paired with others could account for their rating of the traits, and awareness would thus be an alternative explanation to classical conditioning.

The fact that awareness occurs does not mean, of course, that classical conditioning does not. As Farber (1963) has pointed out, it is as reasonable to assume that awareness occurs as a by-product of conditioning as that awareness alone results in the particular response. In support of the
former point of view, Staats (see Staats and Staats, 1959), has shown that Ss do not become aware until well into the conditioning session, and that it is the highly conditioned Ss who eventually do become aware.

While both Staats and Byrne have used instructional guises and post-experimental inquiries, they both have also suggested (e.g. Byrne and Clore, in press; Finley and Staats, 1967) that the awareness issue is of minor importance concerning use of S-R learning theory as a model. Whether or not a cognitive explanation of their results is possible, the S-R model serves to predict, unify aspects of social behavior with other psychological concepts, and suggest research which might not otherwise have been conceived.

In addition, the learning terminology used to describe Ss' behavior seems to fit the definitions generally used in the animal laboratory. For example, reinforcement is defined as a stimulus which increases the probability of a response (e.g., Skinner, 1938), and this definition describes words which follow instrumental responses in verbal conditioning studies (e.g., Greenspoon, 1955; Finley and Staats, 1967; Golightly and Byrne, 1964). In classical conditioning, a stimulus which originally did not elicit a specified response comes to do so, and roughly the same phenomenon occurs in conditioning of meaning.

In view of the correct terminology and predictive ability of the S-R model, awareness may seem unimportant.
If Ss are aware that pleasant words are paired with one set of trigrams, or that pleasant words follow a left-hand button-push, this does not explain the rating of the trigrams themselves nor the increased probability of a left-hand button push. Nonetheless, there is a great deal of evidence which does suggest that awareness of the hypothesis being tested by E influences S to behave in the way he is expected to behave (e.g., Orne, 1961; Rosenthal, 1963). The question then reduces itself to this: does awareness of the contingency also result in awareness of the demand characteristics of the experiment? This is, of course, unknown. (For an interesting attempt at separating these variables, see Insko and Oakes, 1966).

Perhaps it is because the awareness issue seems incapable of resolution that it seems relatively unimportant, especially in view of the apparent usefulness of an S-R model. Nonetheless, the problem probably should not be and has not been ignored, as is obvious from some of the studies cited above. Maltzman and Raskin found an association between awareness and the orienting reflex. Staats has found support for the contention that awareness is a by-product of conditioning, and Insko and Oakes attempted to separate contingency awareness from demand-characteristic awareness.

In the present study, an attempt was made to further examine the differences between aware and unaware Ss. Informal analysis of the data from these two groups showed some rather
striking differences. As reported in Chapter IV, none of the aware Ss rated negatively paired trigrams positively or vice versa, while all but three of the sixteen unaware Ss did. Thus, while it could by argued (e.g. Cohen, 1964) that the test of awareness was inadequate, that the "unaware" Ss were actually aware but did not verbalize it, their actual responses to the trigrams would seem to be poor support for such a contention. If they actually were aware, and if awareness implies conformity to demand characteristics, it would seem reasonable to expect their ratings to be consistent in showing such conformity.

In view of the apparent relationship between verbalization of awareness and consistency of rating, a more conservative procedure for eliminating aware Ss may be suggested. In the present study, awareness was judged on the basis of responses to a single question regarding the purpose of the study. While more detailed probing has been used (Cohen, 1964), it was thought that such a procedure might lead to a report of "awareness" which did not actually occur until the post-experimental inquiry. However, it would be possible to combine these approaches, as follows.

Following the conditioning procedure, S could be asked to write his response to the usual question. E could then examine his response immediately, and if S indicated awareness he would be dismissed as previously. However, if S did not indicate awareness, E would check the consistency of his
ratings as an indication of awareness of the demand characteristics. If the ratings were consistent (no positively paired trigrams rated negative, and vice versa) he would be questioned in more detail.

The above is a suggestion for assessing the demand-characteristic awareness of Ss based on their actual ratings. If an operational definition of demand characteristic awareness includes the requirement that Ss conform to E's expectancy, then Ss who do not conform should not be considered aware of the demand characteristics.
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APPENDIX I

WORD MEANING SCALES

Name: ______________________ Age: ____ Sex (circle one): M F
Class (circle one): freshman soph. jr. sr. Date: __________
Telephone number: ______________

Course in which you wish to receive credit: ______________

The purpose of this study is to measure the meanings of certain words to various people by having them judge them against descriptive scales. Please make your judgements on the basis of what these words mean to you.

Several different words to be judged are presented down the center of each page of the booklet. Beneath each word are two scales. On the first scale, rate the degree to which the word above it has a pleasant or unpleasant meaning to you. On the second scale, rate the degree to which you feel that word describes or characterizes you—the degree to which it is like you or unlike you. Try to be frank, and rate the degree to which each word describes you as you are, not as you would like to be.

Here is how you are to use these scales:
If you feel that the word is very closely related to one end of the scale, you should place your check-mark as follows:

pleasant ✓:____:____:____:____:____:____:unpleasant

OR

pleasant:____:____:____:____:____:____:✓ unpleasant


If the word seems quite closely related to one or the other end of the scale (but not extremely), you should place your check-mark as follows:

like me___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:___:
look up and down the page or back and forth through the
booklet. Do not try to remember how you checked similar
items earlier in the test. Make each item a separate and
independent judgment. Work at fairly high speed through
this test. Do not worry or puzzle over individual items.
It is your first impressions, the immediate "feelings" about
the items, that we want. On the other hand, please do not
be careless, because we want your true impressions.
APPENDIX II
THE 121 WORDS USED IN THE WORD MEANING SCALES
IN ORDER OF APPEARANCE

PLEASANT                  HOT-TEMPERED
ACTIVE                    INTELLIGENT
ABSENT-MINDED             EXUBERANT
WELL-READ                 CYNICAL
HOSTILE                   SOPHISTICATED
SELF-CONSCIOUS            RELIGIOUS
LONELY                    SYMPATHETIC
UNSELFISH                 NEUROTIC
DEPENDENT                 UNINDUSTRIOUS
CONSIDERATE               AGGRESSIVE
CONSCIENTIOUS             INHIBITED
FORGETFUL                 BRAGGING
TALKATIVE                 ANGRY
AUTHORITATIVE             ADVENTUROUS
SENSITIVE                 HAPPY
UNINTELLECTUAL            NEGLECTFUL
SELF-DISCIPLINED          INDIVIDUALISTIC
ANXIOUS                   DEPRESSED
MORALISTIC                FRUSTRATED
ENTHUSIASTIC              TACTLESS
EXPERIENCED               CLUMSY
UNLUCKY                   SELFISH
PROUD INDECISIVE
COWARDLY RADICAL
CONSERVATIVE HIGH-STRUNG
MATHEMATICAL PERFECTIONISTIC
ILL-TEMPERED OBNOXIOUS
WITTY PHONY
DAYDREAMER PROGRESSIVE
GROUCHY BOISTEROUS
SELF-CENTERED REBELLIOUS
POPULAR UNSTUDIOUS
UNWISE LIAR
CREATIVE INTERESTING
MELANCHOLY UNSOCIABLE
UNHAPPY IRRITABLE
AMBITIOUS CONCEITED
SCIENTIFIC LUCKY
DEPENDABLE STUDIOUS
SHY OUTSPOKEN
UNGRACEFUL INHERENTLY UNHEALTHY
CHEERFUL Refined
COOPERATIVE DECISIVE
GOSSIPY ILL-MANNERED
EDUCATED RELIABLE
PERSUASIVE EGOTISTICAL
FOOLISH DIGNIFIED
CARELESS PURPOSELESS
CURIOUS
ENTERTAINING
VIVACIOUS
STINGY
UNINTELLIGENT
DARING
SNOBBISH
SUAVE
ARGUMENTATIVE
IRRELIGIOUS
WORRYING
CHARMING
ENVIOUS
ARTISTIC
PAINSTAKING
JEALOUS
SAD
FORCEFUL
INTELLECTUAL
LAZY
HONEST
SHORT-TEMPERED
PREJUDICED
LOYAL
DISSATISFIED