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## **Social desirability, evaluative feedback, and concept attainment.**

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SOCIAL DESIRABILITY, EVALUATIVE FEEDBACK, AND CONCEPT ATTAINMENT

A Dissertation Presented

By

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Submitted to the Graduate School of the University of Massachusetts  
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PSYCHOLOGY

SOCIAL DESIRABILITY, EVALUATIVE FEEDBACK, AND CONCEPT ATTAINMENT

A Dissertation

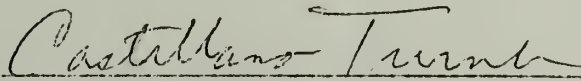
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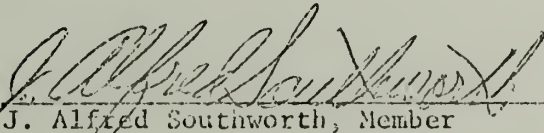
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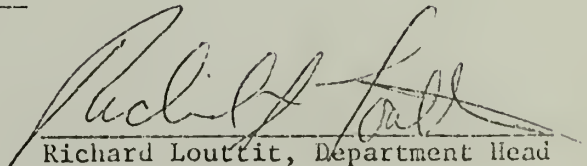
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Finally, I dedicate this dissertation and the accompanying degree of Doctor of Philosophy to two women, Patience Barry and Kathleen Barry who assisted me, in ways both tangible and intangible, through one of the more trying periods of my life.

## ABSTRACT

This investigation was concerned with how problem-solving may be influenced by personality characteristics and interactions between these characteristics and immediate environmental events which serve as background for the problem-solving task. Within this framework of personality-environmental interactive influences upon problem-solving behavior this investigation also attempted to resolve a theoretical controversy concerning a widely used personality measure, the M-C SD scale. The question to be resolved was whether this instrument measured both an approach-type need for approval and defensive avoidance of disapproval as the originators, Crowne and Marlowe, claimed, or whether the measure could be more parsimoniously interpreted as measuring avoidant, defensive behavior alone. Specifically it was posited that under approving feedback conditions the high M-C SD person would perform more efficiently than a low M-C SD person on a concept-attainment task, while under negative feedback the reverse would be true. It was also hypothesized that if the M-C SD scale does reflect n-app., the high M-C SD individual in the approving feedback condition would show a shorter average latency of response, approach behavior, than high M-C SD individuals in a control, neutral feedback condition. The results of an analysis of variance for the dependent variable measuring problem-solving efficiency were contrary to what had been hypothesized as the high M-C SD individuals, under the approving feedback condition, were less efficient than the other sub-groups. A distractability factor was offered as an explanation for the unexpected results. The findings

with the dependent measure used to assess approach or avoidance, response latency, were inconclusive due to an inability to establish a neutral or control group. It was concluded that though there is indeed some type of evaluative dependency measured by the M-C SD scale that this investigation was unable to more specifically clarify the nature of this orientation.

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A description of the research context of this proposed investigation would state that it is concerned with the effects of the interaction between personality and immediate environmental variables and how this interaction may influence problem-solving behaviors of an individual. This focus upon the interactive effects between the individual's personality and his immediate environment and how these effects influence behavior is a reflection of the increasing recognition that accurate behavioral prediction requires knowledge of conditions which are impinging upon an individual in a given situation. A leading proponent of the cross-situational specificity of behavior is Walter Mischel. In evaluating current efforts to theorize upon the nature of personality, he notes that:

Sophisticated dispositional personality theories increasingly have come to recognize that behavior tends to change with alterations in the situations in which it occurs. They note, however, that the same basic underlying disposition (or genotype) may manifest itself behaviorally in diverse ways in different situations so that heterogeneous behaviors can be signs of the same underlying trait or state (Mischel, 1968, p. 38).

A more specific example of this increased emphasis upon the importance of the personality-environment interaction in predicting behavior is illustrated in the following recent study.

Kates and Barry (1970) showed that successful problem-solving is dependent both on personality factors and on interactions between these factors, task-related demands, and environmental conditions. It was demonstrated that individuals assessed as high on the personality characteristic failure-avoidance, under task conditions which required verbalization of the correct solution of a concept-attainment problem and which involved

negative experimenter feedback, in contrast to individuals low on failure-avoidance, developed a handicapping caution which significantly impeded task-solution. However, when conditions were changed so that (1) task-solution required a non-verbal criterion, (2) there was a subtle omission as to what the tempo of solution should be, and (3) the mode of experimenter feedback was of a more neutral, much less censuring nature, it was the high failure-avoidant who excelled.

The results of this study delineate a personality characteristic, failure-avoidance, which when prominent in an individual under conditions of social censure elicits avoidance responses which hinder conceptual problem-solving. Further, the findings of Kates and Barry demonstrate unequivocally that the same basic underlying disposition, failure-avoidance, manifests itself behaviorally in apparently diverse ways, relative success or non-success in concept-attainment, given different task-related situations. In doing this, it empirically reaffirms Mischel's statement concerning dispositional personality theories. Finally, this study in part lends substantiation to the contention that more focus is needed upon the specific conditions of different test situations and the interaction between these conditions and motivational and/or personality factors.

This proposed investigation, then, is a continuation, in terms of its principal assumptions, of the perspectives on personality expressed and the study just described. It assumes that problem-solving behavior is functionally related to personality dispositions and interactions between these dispositions and the immediate environment. Specifically,

we shall be investigating the personality construct measured by the Marlowe-Crowne Social Desirability Scale (M-C SD) and which is described in the literature as need for approval (n-app.). This proposal shall be concerned with assessing the influence of a high or low score on the M-C SD scale upon problem-solving behaviors utilizing concept-attainment tasks and various types of experimenter feedback. In addition, and no less importantly, this investigation shall attempt to resolve a controversy surrounding the M-C SD scale, which, briefly, is whether the scale can be taken as a measure of both need for approval and defensiveness, as is claimed by its originators, or whether the scale measures simply defensiveness alone. This investigation represents an initial effort to study the possible interrelationships between high or low scores on the M-C SD scale with conceptual tasks under different types of experimental feedback.

### THE PERSONALITY VARIABLE

Crowne and Marlowe (1960) have devised a scale which measures the degree to which individuals evaluated themselves in a socially desirable fashion. Scores on this scale initially represented response sets of individuals in a test-taking situation. Later, based upon certain empirical findings, they posited that this social desirability measure reflected a personality variable, need for approval. Finally, the Marlowe-Crowne Social Desirability (M-C SD) Scale was further described as evaluating not only need for approval (n-app.) but defensiveness also.

The M-C SD scale is distinguished from its popularly used predecessor, the Edwards Social Desirability Scale, in that it uses items that were either (1) culturally acceptable but probably untrue or (2) culturally unacceptable but probably true of most people. In either case, these items, unlike those of the Edwards SD scale, were not clinically oriented. An example on the M-C SD scale of a culturally acceptable and probably untrue item would be "I have never intensely disliked anyone," while an example of a culturally unacceptable and probably true item is "I like to gossip at times." On the other hand, items on the Edwards SD Scale were derived from the M.M.P.I. and, as has been stated, were clinically oriented. As a consequence, Crowne and Marlowe felt that though the Edwards SD items have been represented as measuring the wish to appear socially desirable, in truth it may only be assessing whether an individual will or will not acknowledge whether he does or does not possess the maladaptive behaviors described in the

scale. In summary, the original purpose of the M-C SD scale was to serve as a "pure" measure of a person's tendency to portray himself in a socially desirable fashion regardless of his degree of psychological adjustment.

As was mentioned, the M-C SD scale, at first a response-bias measure, came to be interpreted as a more personality-related instrument. Crowne and Marlowe contend that a high score on their instrument has broader personality implications than merely representing a social-desirability response set. They feel that the high M-C SD individual is greatly dependent upon the acceptance, recognition, and approval of others; thus, the M-C SD scale is an indirect measure of need for approval (n-app.). In addition to a n-app. interpretation of their scale, Marlowe and Crowne later posited defensiveness as being reflected by their instrument. This contention that the M-C SD scale reflects dual personality dispositions of n-app. and defensiveness is disputed, however, by Jacobson and Ford (1966) and Ford and Herson (1967), who believe that the M-C SD scale measures defensiveness only. First we will examine how Marlowe and Crowne arrived successively at the n-app. and defensiveness interpretations. Then we shall take up the evidence in support of defensiveness as the sole personality trait tapped by their instrument.

Marlowe and Crowne (1961) hypothesized that during an experiment, high M-C SD subjects would try to maintain the favorable evaluation of the experimenter. To test this hypothesis, a number of subjects participated in a tedious, boring experimental task. Following the

completion of the task, those subjects who attained a high M-C SD scale score described their experiences more favorably. The investigators felt that this favorable evaluation was prompted by a wish to ingratiate themselves with the experimenter and portray themselves in a favorable, socially sanctioned manner. They inferred that this was due to a need on the part of high M-C SD individuals to obtain approval from others.

A common assumption made by Marlowe and Crowne and associates was that high M-C SD scale persons enter into psychological experiments with a strong desire to do well and be positively regarded. Because of this entering set, in a triad of studies of verbal conditioning it was both predicted and confirmed that high M-C SD subjects would show more significant conditioning effects. In the first two experiments, utilizing direct operant verbal reinforcement, the high M-C SD subjects produced more plural nouns and positive self-reference (Crowne and Strickland, 1961; Marlowe, 1962). The third study employed a vicarious reinforcement paradigm. High and low M-C SD subjects were given the opportunity to observe others in the experiment prior to their own participation. It was hypothesized that, because of their need to do well in the eyes of the experimenter, the high M-C SD would focus, in a self-reinforcing manner, on the subtle verbal social rewards given to the observed subject. As was stated, the high, as contrasted with the low M-C SD subjects, did show more rapid conditionability when it was time for their own participation (Marlowe, Beecher, Cook, and Doob, 1964).

Further evidence that the M-C SD scale reflects need for approval was demonstrated by Olsen (1967). She found that individuals high on the M-C SD scale had a higher volunteering rate for psychology experiments and that this high rate was pronounced when the high M-C SD individual had positive expectations as to his performance during the experiment. This finding illustrates the ingratiating behavior of the high M-C SD subject and his fear of "looking bad" during an experiment. Consonant with a n-app. interpretation of the M-C SD scale, other investigations indicate that the high M-C SD individual has been found to be more field-dependent (Rosenfield, 1967), has more difficulty in recognizing and expressing hostility toward others (Schill and Black, 1967; Conn and Crowne, 1964), and, if prevailed upon by the experimenter, would cheat in order to please him (Lanyon and Drotar, 1968).

As has been described, Crowne and Marlowe later added defensiveness as an additional personality characteristic reflected by the M-C SD measure. In their joint publication (Crowne and Marlowe, 1964), they outline several studies whose findings cumulatively suggest that the high M-C SD person is likely to evince self-protective defensive behaviors. This dual interpretation of the M-C SD score began with Barthel's investigation of the relationship between goal-setting in a game situation and M-C SD scores (Barthel, 1961). Barthel first hypothesized that high M-C SD persons would conform more to normative social standards for goal-setting in a competitive game situation. In attempting to account for his positive findings, Barthel included defensiveness as well as n-app. in his explanations, equating the behavioral restriction of the high M-C

SD individual in goal-setting with "defensive rigidity." It was in commenting upon Barthel's findings and "defensive rigidity" explanation that Crowne and Marlowe first mentioned defensive behavior as an additional correlate of high M-C SD scores.

Strickland and Crowne (1963) further document the "defensiveness hypothesis" as an aspect of the M-C SD scale. They hypothesized that high M-C SD individuals, manifesting an avoidant type of resistance, would seek early termination of psychotherapy sessions. They reasoned that the need for the high M-C SD person to maintain the approval of the psychotherapist would cause him to find the demands for personal revelations, involving self-demeaning characteristics, to the therapist as too threatening. This hypothesis was borne out and further confirmed by the therapist's rating of the high M-C SD individual while in therapy as being more defensive than the low M-C SD person. Tutko (1962), utilizing an institutionalized population, predicted that under stressful instructions the high M-C SD person would give constricted, defensive, unproductive, and ostensibly less pathological projective test protocols. This prediction was found to be accurate. A recent variation of Tutko's study with college students, using Rorschach's M as a measure of expressiveness, essentially corroborated his findings and also delineated the importance of considering the interaction between n-app., defensiveness, and the specific situation in making behavioral predictions (Lefcourt, 1969).

Follow-up studies by other investigators utilizing the M-C SD scale tend to further illustrate that this scale taps both n-app. and defensiveness.

In practically all of these studies it is assumed by the investigators that defensive behavior is a consequence of high n-app. In a study investigating the effects of high and low scores on the M-C SD scale on willingness to participate in a group discussion, it was found that when high M-C SD individuals were offered a choice between taking a salient role involving greater evaluative threat or a less prominent role offering little opportunity for approbation, they would significantly more often choose the latter role (Efran and Boylin, 1967). Another investigator reasoned that in a group setting, by varying the conditions under which evaluative feedback is given (either public or private), the high M-C SD person, because of a need for approval, would manifest significantly greater sensitivity when feedback was accomplished via public announcement. His predictions were accurate (Nicholson, 1967), and, in addition, it was found that high M-C SD persons were significantly more cautious and conservative in setting goals or choosing difficulty levels in order to ensure success and ward off negative evaluative feedback. This is a replication of the findings of an earlier investigation in which it was demonstrated that high M-C SD persons under conditions of "ego-threat" take precautions to guarantee success in a competitive game situation (Barthel, 1963). Yet a third study replicated the cautious goal-setting behavior of high M-C SD individuals and also supported the hypothesis that approval-oriented individuals are viewed by their peers as socially defensive (Thaw and Efran, 1967).

On the other hand, some studies have used the M-C SD instrument

as a measure of defensiveness only. In order to employ the Taylor Manifest Anxiety Scale most effectively, the M-C SD scale was used to pinpoint and eliminate those defensive Ss who are prone to anxiousness but may have refused to admit it on the TMAS. A significant difference on digit symbol performance favoring low-anxious Ss was found only when the defensive (high SD low-anxious Ss (low TMAS) were eliminated from analysis (Boor and Schill, 1967). In another study concerned with defensiveness and anxiety, it was hypothesized that highly defensive Ss (high M-C SD scale score) would have less variance on the Cattell Anxiety Scale than those Ss low in defensiveness. The rationale was that highly defensive Ss would be restricted in the extent to which they could admit to behaviors both socially undesirable and implicative of psychopathology, whereas Ss low in defensiveness would include Ss who suffered from psychopathological conditions and admitted to them as well as Ss who did not suffer from such conditions. The prediction was found to be accurate (Fisher and Kramer, 1963). Breger, in citing the fact that the high M-C SD subject displays more covert hostility on the T.A.T. and also the fact of a strong inverse relationship between the M-C SD scale and a measure of insightfulness, supports the interpretation of the scale as a measure of "repressive ego-defensiveness" (1966). Another study found a significant but low negative correlation between the M-C SD scale and the Byrne Repression-Sensitization measure. The high M-C SD individual scores on the low end of the Byrne R-S. Since this end of the Bryne R-S assesses repressive avoidance and denial-of-threat types of defenses, these results augment

and tend to validate the findings thus far described. The investigators in this study, on the basis of this relationship and additional results which indicate that defensive repressors (high M-C SD, low Byrne R-S) had a significantly higher auditory perceptual threshold for sexual sentences than either sensitizers or non-defensive repressors, conclude that the M-C SD scale "might be a better instrument for assessing approach and avoidance behaviors to threatening stimuli than the Byrne scale" (Schill and Althoff, 1968).

This focus upon the relationship between a repressive denial-avoidant type of defensiveness and the M-C SD scale is both reaffirmed and taken one step further by those individuals who have been cited earlier as advocates of a defensiveness only interpretation of the instrument, Jacobson and Ford (1966) and Ford and Herson (1967). Jacobson and Ford (1966) feel that their findings indicate that the high M-C SD person, who is supposed to possess a need to take account of such cues to gain social approval, is not more sensitive to subtle cultural cues. They feel instead that the high M-C SD individual has an "evaluation-orientation" and that their results indicate "the orientation is away rather than toward and involves a repressive rather than a sensitizing type of response." Ford and Herson (1967) hypothesized that if high M-C SD scale responding represents defensiveness, following personal failure the high M-C SD person would manifest less intropunitiveness, as measured by the Rosenzweig Picture Completion Test. The confirmation of their hypothesis led them to reiterate the speculation that the "popular interpretation of the M-C SD scale in terms of

n-app. may need to be revised".

The theoretical differences as to what is measured by the M-C SD scale are relatively clearly outlined. The originators, Crowne and Marlowe, postulate a need for approval with a concomitant interpersonal defensiveness as being reflected in their instrument. Others imply, however, that empirical evidence does not justify a need-for-approval construct but supports defensiveness only. A major focus of this proposed investigation will be an attempt to clarify this area of controversy. It is felt that this clarification can be achieved by setting up certain experimental conditions, involving approving and censuring experimenter feedback, within which individuals shall be required to solve a conceptual task and, by using latency of responses to task stimuli as a dependent measure, to assess need for approval (approach) and/or defensiveness (avoidance) tendencies.

## THE PERSONALITY-ENVIRONMENTAL INTERACTION

Experimental conditions set up to achieve the goal of clarifying what the M-C SD scale measures have been mentioned. In order to understand how these experimental conditions and a dependent measure, latency of response, may resolve this theoretical controversy, it may be helpful to briefly review pertinent background research in two areas. The first area concerns itself with how personality characteristics effect success or failure in problem-solving and performance tasks, Strickland and Jenkins (1964) hypothesized that the high M-C SD scale score individual's desire to do as well as possible in social situations would be generalized to performance on motor tasks. Their results indicated that the high M-C SD scale individual showed a significantly better performance rate than the low M-C SD individual with a rotary-pursuit, time-on-target type of task. These investigators concluded that, in general, high M-C SD Ss tend to perform as well as possible in order to maintain the favorable evaluation of others; hence, they responded to the perceived demands of E and the situation in a cooperative, achieving manner. Wellington and Strickland (1965) confirmed that the high M-C SD individuals would perform significantly better on a series of motor tasks, which led them to posit a general relationship between desire to achieve favorable evaluations and motor and social behavior. Rosenfield (1967) predicted that because of the high M-C SD individual's omnipresent fear of being negatively evaluated, a delayed auditory feedback task, which is highly conducive to eliciting errors, would be especially threatening to these individuals and that

they would consequently have a slower rate of speech in the D.A.F. to guard against errors in the form of speech disruption. The results of the study confirmed Rosenfield's predictions. Finally, Crandall (1968) found that high M-C SD persons required fewer trials to learn a paired-associates task because, as he states, of their strong ego-involvement.

Representative of the second body of research, concerned with the effects of experimenter feedback upon human problem-solving, are the early studies of Hulon and Katz (1935) and Silleck and Lapha (1937). Both investigations, in assessing the relative effects of emphasis upon right or wrong responses in human maze-learning, demonstrated inferior performances for those individuals who learned via an experimenter focus upon their mistakes. Sechrest and Wallace (1962), on the basis of their findings, speculated that experimenter feedback may be interpreted by subjects as either an informational response or as an aversive appraisal. Later, Wallace (1964) found that hypothesis-inhibition occurred significantly more often with negative verbal feedback ("wrong" or "incorrect") than when in impersonal auditory tone of low intensity was used. He concluded, in a definite manner, that human verbal feedback may take on aversive properties and thus has a motivational as well as informational potential. Byers (1965) noted that subjects increasingly delayed responding and offered fewer responses, or hypotheses, about the concept as they progressed through a series of concept-attainment problems. He suggested that the subjects inhibited hypothesis-verbalizations to avoid experimental invalidations which they

interpreted to be punitive and delayed these verbalizations until they obtained what they believed to be the necessary supportive evidence.

In the above investigations, as with that of Kates and Barry (1970), reluctance to respond on the part of the subject has either been speculated upon or directly interpreted as an avoidance tendency prompted by verbal experimenter invalidations which have aversive properties. Buss (1956), utilizing latency of response to conceptual stimuli as an explicit dependent measure, conducted an especially relevant experiment since, in addition, he used the specific types of corrective verbal feedback ("right" or "wrong") which shall be used in this proposal. He found that groups exposed to a preponderance of corrective "rights" had significantly shorter response latencies than groups who underwent verbal feedback consisting primarily of "wrong." What is important to glean from these studies (Buss, 1956; Sechrest and Wallace, 1962; Wallace, 1964; Kates and Barry, 1970) is that negative verbal experimenter feedback appears to be an important factor with respect to response-delay shown by subjects. Consequently, for this proposal response latency has been chosen as a dependent variable to measure the length of time taken by subjects to respond under different verbal feedback conditions. It is hoped that this latency measure will reveal whether high M-C SD subjects delay longer under negative feedback (show avoidant defensive characteristics) and/or respond more quickly (show approach tendencies) when positive evaluation is anticipated. This use of latency of response as a measure of

approach-avoidance behavior is not without research precedence. Marlett and Watson (1968), demonstrating that failure feedback over trials increased the strength of avoidance behavior, used latency of response as a measure of avoidance. It is not too much of an inferential leap to say that if increased response latency is taken as a measure of avoidance, then decreased latency of response can be used to indicate approach.

In this section so far we have briefly reviewed background studies on the effects first of personality characteristics and then of experimental feedback variables upon performance in problem-solving and performance tasks. To conclude this section of the proposal, it may be most appropriate to describe a couple of studies which have special relevance in that both personality and experimental feedback variables are manipulated concurrently, as shall be done in this proposed investigation.

Heilbrun, Orr, and Harrell (1966) demonstrated a relationship between different patterns of parental child-rearing and vulnerability to cognitive disturbance when mistakes in a cognitive task resulted in social censure. They found that a group of college students in the parent-rejected group (high control-low nurturance) demonstrated significant impairment of conceptual performance under censuring conditions (a verbal response "wrong"). In explaining the significant learning inefficiency of the parent-rejected group, these investigators offered an interpretation of an internal, interfering, avoidant-type response which was incompatible with

effective task-behavior. Thus, in this study an interaction between differing family antecedents, conditions of nurturance and control, and censuring experimenter feedback results in individual differences in perception of experimenter feedback and apparently causes differential cognitive functioning on a concept-attainment task. Strickland (1965) found that of four experimental groups, the high M-C SD subjects run under positive, approving conditions showed the greatest improvement in motor performance over trials, while the high M-C SD subjects, under negative-feedback conditions, showed the poorest performance. This study demonstrates the greater disposition of the high M-C SD individual to be influenced, for better or worse, by positive and negative verbal feedback.

To sum up this section of the proposal, it has first been an attempt to describe a number of research studies which serve as the background from which this investigation shall be a logical extension. More specifically, two of the primary experimental conditions shall consist of a personality variable, high or low M-C SD scale scores, and three types of experimenter feedback, approving, censuring, and neutral. In establishing the research precedence for these experimental conditions, the results of the findings of these studies shall also be influential in determining the content of the formal hypotheses which shall be stated. Secondly, within this section several studies have been cited which serve as the empirical rationale for the use of latency of response as a measure

of approach and avoidance. The following section of the proposal pertains to the third and last experimental condition, level of problem-difficulty.

## THE CONCEPTUAL TASK

The tasks which shall be used in this proposed investigation fall within the realm of conceptual learning. As is pointed out by Bourne (1966), the term "concept" has a number of definitions. Roughly paraphrasing, it can mean an idea, refer to an abstraction, or perhaps be synonymous with a mental image. With respect to this investigation, Bourne's operational definition of a concept "as a category of things" or "a concept exists whenever two or more distinguishable objects or events have been grouped or classified together and set apart from other objects on the basis of some common feature or property characteristic of each" is quite appropriate.

Haygood and Bourne (1965) have demonstrated that conceptual learning can be analyzed into two major components, attribute or value identification and recognition of the conceptual rule. As an example of the first component, utilizing the dimension geometric forms, the attributes or values of this dimension which may have to be identified might involve squareness, roundness, or triangularity. Secondly, in order to attain a concept, an individual must also be able to recognize the conceptual rule by which the values are combined to form the concept. As defined by Bourne (1966), "Conceptual rules are rules for grouping. They specify how the relevant attributes are combined for use in classifying stimuli." As examples of conceptual rules, the two types which shall be used in this investigation and which will create the third and final independent variable, level of problem-difficulty, can be briefly described.

The first type of rule is that of conjunctiveness, in which examples of a particular concept involve the "joint presence of" two or more attributes. For example, if the concept is that of a red square, then all examples (or instances) which contain both redness and squareness together would be representative of the concept. The second, and more difficult, type of rule is that of disjunctiveness, in which examples of a particular concept involve the presence of "either one or the other of two or more attributes." Again, if the concept is that of a red square, then all instances which contain either redness or squareness (and both together in the case of inclusive disjunctiveness) would be representative of the concept.

Various writers have speculated as to why disjunctivity in conceptual learning results in much greater problem-difficulty as contrasted with conjunctiveness. In delineating the reasons for these differences in difficulty, Bruner, Goodnow, and Austin (1962) point out that there is an "asymmetry of inference from defining attributes to class membership and from class membership to defining attributes" that is existent with disjunctiveness but not with conjunctivity. Knowing the definitions of the disjunctive class (red squares) can lead only to probabilistic predictions about the properties of exemplars (either red or square). As Shore (1967) points out, on the other hand, with conjunctive concepts, certainty statements may be made, since deduction of the concept (red squares) depends on the presence of the relevant features (redness and squareness)

in all instances of the concept. Thus, one can make absolute predictions about the relevant attributes of an example of a conjunctive concept while there is uncertainty in this respect with disjunctive concepts. Bruner suggests that this certainty of prediction is responsible for the preference which people demonstrate for conjunctive conceptualization as contrasted with disjunctiveness.

In the study by Kates and Barry (1970), it was demonstrated that a personality variable which was influential in determining efficiency in attaining disjunctive concepts did not have as pronounced effects with conjunctive problems. By including this independent variable, level of problem-difficulty, it is hoped that the generalizability of these findings can be assessed under different experimental conditions, utilizing the M-C SD scale.

To summarize, a broad aim of this investigation is to attempt to ascertain in what manner problem-solving behavior may be related to personality characteristics and interactions between these characteristics and varying surroundings within which the problem is presented.

Specifically stated, a prime concern is whether high-or-low scoring M-C SD individuals are differentially affected in their concept-attainment efficiency under various types of experimenter feedback, censuring, approving, and neutral, with two different levels of problem-difficulty, disjunctive and conjunctive. Within this framework of possible personality-environment influences upon concept-attainment behavior, this investigation shall also attempt to resolve a theoretical controversy extant concerning the widely used personality measure, the

M-C SD scale. Simply stated, the problem to be resolved is whether this instrument measures both an approach-type need for approval and defensive avoidance of disapproval, as the originators, Crowne and Marlowe, claim, or whether the measure can be more parsimoniously interpreted as measuring avoidant defensive behavior alone. It is hoped that with the aid of the three types of experimenter feedback described and utilizing a second dependent measure, latency of response, this question may be clarified.

## MAJOR HYPOTHESES

The first set of hypotheses which pertain to the independent variable, type of experimenter feedback, and the dependent variable, average latency of response, is as follows:

1. The approving type of experimenter feedback will generate approach responses generally among high and low M-C SD subjects, resulting in shorter average response latencies than under the neutral feedback condition.
2. A disapproving type of experimenter feedback will generate avoidance responses generally among both high and low M-C SD subjects, causing the average response latency to be significantly longer than for the neutral feedback condition.
3. The significant effects predicted above for the latency of response and type of experimenter feedback shall hold under both levels of problem-difficulty, disjunctive and conjunctive.

The second set of hypotheses pertaining to the independent variable, high or low M-C SD scale score, and the dependent variable, average latency of response, is as follows:

4. Reflecting the consensus of opinion as to a defensive avoidant component associated with a high M-C SD scale score, individuals in this group under the disapproving condition shall have a

significantly longer average latency of response than the high M-C SD control group. In addition, this longer latency shall be longer than that for any group or subgroup in the design.

5. Relevant to response latency of the M-C SD groups under approving feedback, if a high M-C SD scale score is in fact reflective of a high n-app., then approval-seeking, approach types of behavior among the high M-C SD group shall result in a significantly shorter average response latency as contrasted with the control. In addition, this significantly shorter latency should be shorter than that for any other group or subgroup in the design.
6. The significant effects both predicted and conditionally hypothesized as occurring with respect to the dependent measure latency of response and the variable high or low score on the M-C SD scale shall hold under both levels of problem-difficulty, disjunctive and conjunctive.

The third and final set of hypotheses pertains to the number of instances to solution, the dependent variable measuring efficiency of problem-solving, and the independent measure of high and low M-C SD scale score and type of experimenter feedback:

7. If we can generalize from previously cited studies, it can be hypothesized that the efficiency of the high M-C SD person under censuring feedback will be impaired, resulting in a significantly higher number of trials to solution than that of the low M-C SD individual.
8. Conversely, and again making a tentative generalization from prior studies, the high M-C SD group under the approving condition will be more efficient than the low's, requiring fewer number of trials to criterion.
9. The final hypothesis is that the differences in efficiency hypothesized for the personality variable high or low M-C SD will be most pronounced under the higher level of problem-difficulty involving the disjunctive task.

## METHOD

SUBJECTS

The M-C SD scale was administered to a group of 365 students at the University of Massachusetts. There were two criteria for selection for the experimental groups. First an individuals scale score had to fall at either extreme of the distribution. Those individuals who fell in the high M-C SD scale group had a mean of  $\bar{X} = 21.03$ . Those individuals in the low M-C SD scale group had a mean of  $\bar{X} = 4.78$ . For both the extreme groups on the personality measure, either high or low, those sub-groups in the three feedback conditions did not have M-C SD scale means which differed significantly from the total mean for their particular extreme group.

The second criterion for selection involved sex as each of the sub-groups at either extreme was balanced for this variable. Studies both past (Crowne and Marlowe; 1960) and more recent (Cosentino and Kahn, 1967) had found no significant differences between the means and variances of male and female M-C SD distributions however it was felt that it might have been presumptuous to assume a between-sex personality equivalence for individuals with similar M-C SD scale scores.

From the sample of students pre-administered the M-C SD scale, and on the basis of the above criteria, a total of 72 subjects were chosen and participated in the experiment; 12 high M-C SD scale people and 12 low M-C SD people for each of the three feedback conditions.

DESIGN

The experimental design was a 2x3x2 (two between and one within)

analysis of variance. The first, two-leveled condition was the personality variable represented by either a high or a low score on the M-C SD scale. The three-leveled variable was the different types of corrective feedback conditions consisting of negative (social censure), positive (approving), and the neutral reinforcement schedules. The within variable the two tasks were incorporated in the design in counter-balanced fashion in order to control for possible sequential effects.

#### MATERIALS AND APPARATUS

The M-C SD scale, which is a true-false questionnaire, 33 items long, was administered in conjunction with a computer scoring sheet. The standard instructions for this instrument preceded the test items along with additional information describing the correct spaces to fill in on the scoring sheet representing either a true or false response.

The stimulus patterns used for the two concept-attainment tasks were geometric designs prepared on slides for use in a slide projector. These geometric designs varied along four three-value dimensions. The dimensions and their values were: form (square, diamond, and triangle) color (orange, yellow, and green), Arabic number inside of each form (1, 2, and 3), and type of border around form (none, dotted and solid). Total number of instances (slides) generated by the four three-valued dimensions described was 81. During the performance of the two concept-attainment tasks each slide was presented to each subject one at a time (reception strategy) in exactly the same random order.

A sample chart showing all possible values of each dimension was left exposed at all times. The subject and the experimenter sat in the same room, with the subject's back toward the experimenter. Two specially built electric consoles with lights and toggle switches were used for subject choice and experimenter feedback. Presentation of stimuli was performed by remote-control of two slide-projectors situated directly in back of the subject with the slides being projected directly on the wall in front of him. Response latency was recorded on graph paper of a single-needle chronograph which traveled at the rate of 1 millimeter per 0.7 second.

#### PROCEDURE

At the outset of the concept-attainment tasks, all subjects were given detailed oral instructions describing the stimulus population. These instructions were worded as follows:

In this experiment we are interested in how various individuals go about solving conceptual tasks. These tasks use a series of illustrated slides which will be displayed, one at a time, on the wall in front of you. Each of the slides contains one geometric figure representing four different dimensions, with three values for each dimension. On the wall in front of you, you will see a chart illustrating the four dimensions and the three values for each dimension.

- Dimension #1 is form, and its three values, shown to the right of it, are diamond, square and triangle.
- Dimension #2 is color, the geometric shapes just mentioned can be colored green, orange, or yellow.
- Dimension #3 is the Arabic number inside each form, and its values are the numbers 1, 2, and 3.
- Dimension #4 is the kind of border around each shape; a solid border, a dotted border, or no border.

Following this description of the task materials and an elicitation of the subject's comprehension of these materials, each subject was required to participate in a practice task consisting of a simple unidimensional concept of only one value. In the practice task, each subject was required to move a switch to a "yes" or "no" position if he believes a stimulus card does or does not include the correct value no border and the conceptual rule (any card having the value no border on it was an example of the correct concept). In this practice task, the other three dimensions were irrelevant to solution.

The rationale for the inclusion of a preliminary task was to (1) reduce unwanted inter-individual variability (error variance) due to differences in acclimatization to the task materials, procedures, and equipment and (2) to present an opportunity for the assimilation by S

of the particular type of experimenter corrective feedback conditions (neutral, censuring, or approving) which he underwent.

The instructions for the practice task read as follows:

Let's do a simple practice problem first.

In it I will be thinking of only one of the values on the chart, and you must find out which value I am thinking of. After the slide is exposed on the wall in front of you, you shall indicate whether the slide does or does not contain the value I am thinking of. If you think it does, push the switch in front of you to the "yes" position; if you think it doesn't, push it to the "no" position.

At this point the content of the instructions varied depending upon the particular experimenter feedback condition the S had been assigned to.

For the neutral feedback condition the instructions stated:

If you are correct in your choice, then the white light directly in front of you shall flash on. If you are incorrect, the amber light will flash on.

For the censuring feedback condition, the instructions stated:

If you are correct in your choice, then the white light directly in front of you shall flash on and we shall go on to the next card. If you are incorrect in your

choice, I shall inform you of this by saying "wrong" and the amber light will flash on.

For the approving feedback condition, the instructions stated:

If you are correct in your choice, I shall inform you of this by saying "right" and the white light will flash on. If you are incorrect in your choice the amber light will flash on.

After allowing for this instructional variability, which specified the particular corrective feedback condition to which the subject belonged, the instructions for the practice task continued along, exactly the same for all subjects as follows:

Before we begin this practice task, I am going to give you a clue and state that the one value I am thinking of is associated with one of the two dimensions of border or number. The two other dimensions, and their associated values, form and color, do not have to be considered. A last word is that in order for this practice task to be considered successfully solved, you must be correct

in your choice of "yes" or "no" for ten consecutive slides.

After successful completion of this simple practice task, the instructions for the main experimental tasks was worded as follows:

Now we shall go on to the main task. In this task, as in the practice task, the sequence in which the slides appear is not important, since they are randomly presented on the wall. The task is different from the practice task in important ways. The first difference is that now not one but two values are important, and you must discover which these two values are.

As before, I am going to give you a clue and state that the two values I am thinking of are associated with the two dimensions of form and color. The two other dimensions and their associated values, number and border, do not have to be considered.

The reason for the introduction of these clues, which gave the subject a correct dimensional focus, was founded upon the experience of this writer with this type of concept-attainment task. Just as a minimum difficulty level is required, so too was an optimal level desired. This

optimal level should be such that a reliably long sampling of subject behavior can be obtained while at the same time there would not be any sizeable attrition of N due to too many subjects who cannot solve the problem within a practically feasible time. The clues as to the correct dimensions enhanced the goal of an optimum difficulty level for this type of concept-attainment task.

The first dependent measure was response latency which was averaged for each individual while the second was a record of the number of instances (slides) which the subject required to solve the problem, with the criterion of problem-solution requiring 10 consecutive correct responses. Further after the subject had achieved this operational criterion he had to verbally state the two correct values and also the rule which governed their relationship: ex; for the conjunctive task "both together", "always on the same slide", etc. For the disjunctive task "can be either one or the other", "can be by themselves" "doesn't have to be together", etc.

The inter-trial interval for presentation of the task stimuli was automatically set at 5 seconds. It was found that this interval allowed ample time for the experimenter to record the subjects response and give the appropriate feedback. Of those individuals selected for the experiment only three proved unable to understand the procedure even after completion of the practice task and were disqualified from the experiment and replaced by three others. This experimenter during presentation of the task stimuli verbalized the feedback, either approving or disapproving, with a studied monotone neither varying the intensity or

the inflection throughout a particular sequence of presentations.

It should be noted however, that for those individuals who took, relatively speaking, an excessive amount of time in responding to the stimuli this investigator was aware of subjective feelings of impatience which may have influenced adversely his attempt at standardizing the verbal feedback.

## RESULTS

With respect to the hypotheses which have been made, and taking them in the order in which they have been presented, the statistical analysis indicated the following results.

1. The first hypothesis pertains to the relationship between the independent variable type of experimenter feedback and the dependent variable latency of response. This hypothesis was not supported; the approving type of experimenter feedback did not result in shorter response latency as compared to the length of latency under the neutral condition.

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Insert Table 1 and 15  
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2. The second hypothesis was not confirmed. The disapproving type of experimenter feedback was not associated with a significantly longer average response latency than was the neutral experimental feedback condition.

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Insert Table 1 and 15  
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3. The third and last hypothesis which pertained to the type of experimenter feedback and average latency of response was predicated upon statistically significant findings occurring between these independent

and dependent variables and stated that these significant findings would hold under two levels of problem difficulty, disjunctive and conjunctive. Needless to say the lack of significance described invalidates this particular hypothesis.

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 Insert Table 5 and 15  
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The second set of hypotheses pertained to the independent variable high or low M-C SD scale score and the dependent variable average latency of response. The statistical analysis indicated the following:

4. It was hypothesized that if in fact there is a defensive avoidant component associated with a high M-C SD scale score, individuals in this group under the disapproving condition would have a longer average latency of response than high M-C SD people in the control or neutral feedback condition. Reference to Table 4 indicates that this did occur; however, Table 15 demonstrates no significant differences between these two means. Therefore this fourth hypothesis is rejected.

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 Insert Table 4 and 15  
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5. This hypothesis was concerned with the average response latency of the high M-C SD individuals in the approving

condition vis-a-vis high M-C SD people in the neutral feedback condition. The rationale was that if the high M-C SD scale score is in fact reflective of approval-seeking this would arouse approach types of behavior. Hence there would be shorter average response latencies of the highs under the approving condition versus the highs under the neutral condition. As indicated in Table 4 this did not occur and in fact the high M-C SD people under the approving condition had a somewhat longer average latency of response than those under the neutral though the difference was not significant as indicated by Table 15.

6. This hypothesis was concerned with whether the predictions made earlier (involving hypotheses four and five) would hold under the two levels of problem difficulty, the disjunctive task versus the relatively easier conjunctive task. Since the predictions were not confirmed this particular hypothesis is rendered invalid.

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 Insert Table 7 and 15  
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The third and last set of hypotheses pertained to the dependent variable measuring efficiency of problem solving, that is the number of trials

needed to reach a criterion of problem solution, and to the two independent variables involving the personality measure of high and low M-C SD scale scores and the three experimentally manipulated feedback conditions; neutral, approving, and disapproving.

7. Based upon the findings of prior research it was hypothesized that the efficiency of the high M-C SD person under censuring feedback would be impaired resulting in a significantly higher number of trials to solution than that of the low M-C SD individual. Both Tables 11 and 16 indicate respectively first the means and second there are no significant differences between these means.

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Insert Table 11 and 16  
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The efficiency of both personality groups high and low M-C SD under the disapproving feedback condition is approximately the same.

8. This hypothesis again was based upon prior studies and stated the converse of the seventh hypothesis namely that high M-C SD groups under the approving condition will be more efficient than the lows and would require fewer number of trials to criterion. The statistical analysis indicates just the opposite. The high M-C SD subjects were less efficient in solving the problems under the approving feedback.

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Insert Table 11  
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9. The final hypothesis pertained to the level of problem difficulty and differences in problem solving efficiency as a function of the personality variable. It was generated by the prior two hypotheses, seven and eight, and by a study cited in the introductory section of this investigation. It stated that the effects predicted for hypotheses seven and eight would be most pronounced with the more difficult disjunctive conceptual task. Referring to Table 14 and 16 it can be seen that the feedback X personality scale X task interaction was not significant.

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Insert Table 14 and 16  
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The nonsignificant differences between the high and low M-C SD groups under the censuring feedback condition hold up under both the difficult disjunctive task and the easier conjunctive task and the same is true for the approving feedback condition.

## DISCUSSION

One primary focus of this investigation was to attempt to ascertain whether a high score on the Crowne-Marlowe Social Desirability Scale (M-C SD scale) was indicative of both a high need for approval (n-app.) and a high level of defensiveness as the originators of the scale claim or whether, as other investigators hypothesized, a high scale could only be interpreted as measuring defensiveness alone. The initial portion of this investigation outlined research findings first supporting the high (n-app.) and defensiveness point of view and then included a review of that literature which substantiated a defensiveness only hypothesis.

After the presentation of conflicting opinions and review of literature cited as evidence by both sides this investigator set forth an experiment which he felt might contribute to the resolution of the opposing views regarding this personality measure. This experiment was founded upon certain assumptions and research findings. Though these assumptions and findings are intertwined with each other, for the sake of clarity it is best to consider them separately.

In order to define defensiveness and approval seeking it was first assumed that terms which could be substituted, and which had the advantage of being more measurable were, respectively, avoidance and approach. Using avoidance as an operational measure of defensiveness does not appear to be that unwarranted since personality theories, research findings, and everyday life experience all offer evidence that avoidance behavior can be and is used in this manner. Likewise, although approval-seeking can take many behavioral forms within the human context, approach-types

of behavior may be one of the more prominent of these forms. Avoidance and approach can be measured spatially or temporally, that is in terms of amount of distance or of time. It was with respect to amount of time elapsed between presentation of a stimulus, in this case conceptual task stimuli, and subject response that this experiment quantified avoidance and approach. More specifically the dependent measure, response latency, was reflected in seconds with decimal places rounded off to one-hundreth of a second.

The above is a description of the assumptions underlying the selection of the dependent measure, response latency. Another primary assumption related to the design of the experiment and was responsible for the selection of the particular feedback conditions described in the methodology. It was assumed that three feedback conditions could be established which, in general, without consideration of personality variables, would result in average response latencies which were shortest for a positively reinforcing verbal feedback, longest for a negatively reinforcing verbal feedback, and intermediate when non-verbal visual cues, specifically lights, were used as feedback. It was felt that this last condition, by dint of its intermediate average response latencies, could be characterized as "neutral" with respect to the other two feedback conditions. More specifically it was assumed a "neutral" feedback condition could be established since there is research precedence for the predictions of the ordinal rankings of the average response latencies for the two verbal feedback conditions (Buss, 1956).

The rationale for the attempt to establish a "neutral" condition was two-fold. First it was hoped that within the confines of this experiment

establishing this intermediate response latency condition would lend empirical substantiation to the assumption described earlier that is brief response latency can indicate approach behavior which in turn can be taken as a manifestation of approval seeking. And, also, prolonged response latency under negative feedback would give confirmation to the labeling of the slower reaction time as avoidance behavior which in turn can be considered as indicative of defensiveness.

In addition to attempting to justify the labeling of two verbal feedback conditions, a second reason for attempting to set up a "neutral" condition resides in the usage of the control group in psychological research. In the design of this particular experiment the neutral feedback condition was also intended to function as a control group. The procedure of this feedback condition was exactly that of the other two with the sole exception of the verbalizations "right" or "wrong" being omitted.

The last few paragraphs have been devoted to a description of the logical assumptions underlying the selection of the dependent variable, response latency. Additionally there was focus upon the necessity for the establishment of a "neutral" feedback condition both in terms of lending accuracy semantically, to the labeling of the two verbal feedback conditions, and also in terms of its' functioning as a control group which would put to stringent test the acceptance or rejection of a need for approval construct associated with the M-C SD scale.

However, a statistical trend did not occur in which response latencies in the so-called neutral condition were, on the average, intermediate with those of the verbal feedback conditions. In this experiment, the lack of statistical results, both in terms of significance and the desired mean

trend for the average response latencies indicate a failure in establishing a neutral feedback condition and consequent adequate control group. Therefore this experiment cannot offer any resolution of the theoretical controversy.

Perhaps one of the first, most obvious speculation, which could be made as to the failure in establishing significant findings with the dependent measure, response latency, was that it was correlated with the second measure, trials to criterion. That is that the tendency of an individual to respond quickly or slowly to the task stimuli is influenced by the ability of the individual to solve the problem efficiently.

A simultaneous comparison of the group means for the two dependent variables indicates no such correlative relationship. No clearcut pattern can be observed whereby average reaction time can be established as a co-factor in either a more efficient or less efficient solution of the problem. While the efficiency of the low M-C SD group is approximately the same across feedback conditions there is relatively greater variability in average response latency. Conversely we find relatively substantial variability across feedback conditions for the high M-C SD group in trials to solution while, compared to the lows, the variability of mean response latencies is less. A Pearson product moment calculated between the two dependent measures for the 72 subjects indicates an  $r = + .15$  which is nonsignificant.

Comparative observations of the means of the two dependent variables, and a statistical calculation indicate no correlative trend. Instead the relationship appears to be random which in turn tends to invalidate the speculation that the lack of significant findings among groups for average

latency of response was due to differing capabilities of the groups in problem solving efficiency.

Focusing upon the methodology as the problem area the appropriateness of the modalities of the feedback conditions, verbal and an impersonal visual cue, could be questioned. In the methodology of those studies of most relevance, in terms of examining response inhibition as a function of different types of feedback, we find that the procedural differences outweigh the similarities with this experiment. Direct comparison of the results of other studies with this one is rendered difficult because others (Buss, A. 1950, Byers, J. L., 1965, Marlett, N. J. and Watson 1968, Sechest, L., and Wallace, J., 1962, Wallace, J. 1964) did not establish a third or neutral feedback condition.

Further the combinations of feedback modalities used, were, for the most part distinctly different, with the exception of one study (Kates S. and Barry W. 1970) which used both verbal and visual feedback. In two studies which most closely approximated this one in terms of the use of a precise time measure, response latency, only verbal feedback ("right or wrong") was used in one (Buss A. 1950) or impersonal auditory feedback (a buzzer) was used in the other (Marlett N. and Watson D. 1968). Despite the lack of precedence in attempting to establish a neutral condition and the dissimilarities in the types of feedback modalities or dependent measures used it is important to note that the results of this experiment are not contradictory with other findings. That is the mean trend, specifically with respect to the failure feedback condition, was congruent in that this type of feedback result in greater response inhibition. However, it should be noted the results of this study did not

indicate statistically significant response inhibition.

What has been established by this investigation is that a neutral condition and its defining attributes are difficult to establish. In analyzing the inability to establish a neutral condition for latency of response one can conjecture that perhaps some other type of feedback would have been more appropriate. Perhaps the utilization of an impersonal auditory signal at an intensity level just sufficient for discrimination, as was done by Wallace (Wallace J. 1964) would have facilitated the establishment of a neutral condition. Several post hoc conjectures can be made regarding what might be a more appropriate type of feedback; however, this essentially is an empirical question best answered by further experimentation.

Another consideration concerning the inability to establish a neutral condition is prompted by the average response latencies for those individuals under the verbal feedback conditions. They attained a consistently longer reaction time than those in the visual feedback condition for both the easy (conjunctive) and the difficult (disjunctive) task. One could speculate that subjects in this experiment inhibited responding whether the verbal feedback was approving or disapproving relative to an impersonal visual one. The above is not meant as a generalization but as a statement specific to this experiment. It is important to note this specificity since it is obvious that if the modality of the neutral feedback were intense enough, a glaring light, a loud aversive noise, etc. then response inhibition would have been much more likely under this circumstance.

Finally it is possible that the results of this investigation, with respect to response latency indicate the difficulty of quantifying

approach behavior. Because of the problem of controlling for the subjective state of the individual response, latency, used to assess approach could be measuring disparate, if not contradictory, modes of behavior. For example, it may well have been that of the group of individuals under the approving condition some may have responded more quickly to gain approval while others may have responded more slowly in order to insure an approving response from the experimenter.

The thrust of this experiment encompassed two broad areas of inquiry. The first, which has just been discussed, involved an attempt to resolve a theoretical controversy in the realm of personality research and this attempt, for any one or all (or none) of the reasons speculated upon, produced unsatisfactory findings. The second broad area was concerned with ascertaining possible personality environmental interactive effects which may affect problem solving behavior. Specifically this investigator was interested in whether groups having extremely high or low scores on the M-C SD scale would exhibit differences in problem-solving efficiency with concept attainment problems under different verbal conditions, approving and disapproving.

A number of findings described earlier served as a foundation for the conjecture that the high M-C SD groups, under censuring feedback would be more impaired than the lows in efficiently solving concept-attainment problems, while just the reverse would occur under approving feedback conditions. It also seemed logical to this investigator that if an individual scored high on a scale designed to assess how much he wished to present himself in a socially desirable

light, that especially with college students who would be more keenly attuned to intellectual accomplishment relative to the general population, their cognitive functioning would be more vulnerable to disruptive impairment under censuring feedback conditions. Obversely it also seemed logical that the supportive environment of a strictly approving feedback condition would have more positive impact with respect to the cognitive functioning of the high M-C SD vis-a-vis that of the lows.

The results of this experiment did not lend support to the hypotheses. The high M-C SD individuals under the censuring feedback condition did not perform in any significantly inferior fashion than the lows in efficiency of problem-solution, and, paradoxically in light of aforementioned empirical results and logical inferences made, the high M-C SD people were inferior to the lows in problem-solving efficiency under the approving feedback condition.

The analysis of variance and the means for trials to solution indicated that the significant main effect for the feedback conditions were the result of the significant interactive effects between the feedback conditions and the personality variables. Statistical tests conducted to assess which pair of means made the primary contribution to the significant interactive effect yielded a  $t = 2.16$  which was significant at  $p < .05$  for the groups of high M-C SD individuals under the neutral and approving conditions. The next largest difference between group means, the high M-C SD individuals in the approving and disapproving condition, yielded a  $t = 1.77$  which was not significant

making further tests of significance between subgroups with smaller mean differences unnecessary.

In essence then results which were expected to occur with the high M-C SD people under the "positive" unconditionally approving feedback situation occurred under a neutral condition which was free, relatively speaking, from an intense evaluative atmosphere. To explain these somewhat paradoxical findings the procedural similarities of this study with the more relevant experiments described in the first part of this paper should be commented upon. Factually the similarities prove to be almost nil for whereas the feedback in the prior studies were either inferred as a self-regulatory mechanism, conveyed in a covert, subtle manner so that S was at best dimly aware of it, or made quite overt but with relatively long time intervals interspersed in between delivery, the feedback in this experiment was methodologically quite different. In this study the verbal feedback was almost intrusive in that it occurred quite explicitly every time S made a response and, as a consequence, had a relatively high frequency of occurrence within a brief span of time.

Keeping this in mind it should be recalled that the theoretical controversy, which was not resolved by this study, focused upon the validity of the two hypothetical constructs which were inferred from a high M-C SD scale score, high n-app. and defensiveness and it was the former construct, high n-app., that was viewed quite dubiously. However there did not seem to be any quarrel with the more general association of a high M-C SD score with a need to present oneself in a socially desirable light. It is this investigators, albeit quite speculative,

contention that this consensually agreed upon "evaluative dependency", as Crowne and Marlowe call it, of the M-C SD person in conjunction with the particular verbal feedback procedure utilized in this study, may have interacted and engendered a state of distractability which impaired functioning in those abstract skills requisite for efficient conceptual problem solving. It could be hypothesized that when the interpersonal evaluative aspect of the feedback is modulated, as was done under the neutral feedback condition, the experiment does yield results somewhat consistent with those of prior findings with the M-C SD scale and paired-associate learning (Crandall, 1968) and motor skill tasks (Strickland and Jenkins, 1964; Wellington and Strickland, 1965; Strickland, 1965).

If this speculation of a state of distractability as an intervening variable has any veracity then both specific and general questions are posed. Specifically the initial perspectives assumed by this experiment on the nature of reinforcement, and of its effects, have to be modified. The complexity of a reinforcement procedure is that even that procedure which ostensibly appears quite simple may contain parameters such as modality, frequency of occurrence, and degree of intensity acting in some unknown interrelated fashion which must be recognized and taken into account if one is to make accurate predictions as to its effects. This statement is especially true when an experimenter attempts to ascertain or predict how a procedure is going to influence the behavior of a complex organism such as an adult human being.

Generally, if there is any validity to the speculation advanced as

an explanation for the outcome of this investigation then broader implications are generated for that aspect of Behavioristic Psychology having to do with principles of reinforcement. As is well known, these principles were formulated and developed in the psychological laboratory primarily with infra-human organisms. These principles have been frequently applied with empirically documented success with emotionally disturbed, exceptional, and retarded children and chronic, institutionalized, populations being perhaps the most notable examples. The results of this experiment do endorse to a small degree a prevailing opinion among many social exientists that these principles of reinforcement are not as simply applied with any high degree of efficacy and/or predictability when one is dealing with an adult human being who possesses complex and intricate capacities for thought and reflection. However the most obvious criticism which can be made of the hypothesized explanation derives from an examination of the results for the group high on the M-C SD scale under the disapproving feedback condition.

The question arises as to why wasn't an efficiency, impairing state of distractability evident under this feedback condition, which, if anything should be considered more distracting because of the negative, evaluative connotation of the verbal feedback ("Wrong"). These particular results pose a rather critical refutation of the post hoc theorizing in which this investigator has been engaging and it is difficult to reconcile them with the causal explanation of the findings under the "neutral" and "approving" feedback conditions.

Perhaps the answer to this seemingly inherent contradiction resides again in what personality characteristics the M-C SD scale purports to measure. Earlier it was noted that it was the consensus of practically all researchers that people who obtained a high score have more of a tendency to be concerned about what others think of them. In addition it was also agreed by most, if not all, that defensiveness was a ramification of this dependency upon the opinions of others. It was the construct, need for approval, which generated disagreement among investigators.

Substantiating the defensiveness construct was a wealth of empirical findings. The high M-C SD scale person has been described as, rigidly defensive in goal-setting (Barthel, 1961), terminates psychotherapy early in order to avoid the disapproval of the therapist (Strickland and Crowne, 1963), gives constricted, defensive, low Rorschach M projective test protocols (Tutko, 1962; Lefcourt 1969), and, under various types of social situations behaves, in defensive fashion. Further evidence includes studies which have used the scale as a measure of defensiveness (Fisher and Kramer, 1963; Boor and Schill, 1967; Schill and Althoff, 1968).

Though this reasoning may appear specious a thought which has occurred to this investigator was that because of this defensive aspect of his personality the high M-C SD person was not caught off guard, distracted if you will, by non-supportive, negative responses from E when he committed an error. Phrased differently, since evidence indicates he is predisposed to expect the worst and therefore adopts a

defensive stance in a variety of interpersonal situations, then a learning task in which verbally punitive responses from E were used did not pose any unexpected surprise. Because of this, unlike under the approving condition, his concentration on the task was not impaired and he performed as well as the other groups.

It is obvious that in attempting to account for results with the dependent measure, trials to solution, this investigator has engaged in a network of speculations. Whether or not a case can be made for more viable explanations this investigator hopes that the results obtained will of themselves have some provocative or heuristic value.

To conclude a brief summary is in order. First the results of this experiment do not controvert but do in fact lend some credence to the notion that the high M-C SD scale individual has an "evaluation-orientation" or dependency upon the opinions of others. However a more ambitious goal of this study, to analyze the nature of this orientation was not realized. Further there was some evidence offered of the importance of the interaction between personality and environmental variables upon an individuals cognitive functioning. Finally broader implications were alluded to pertaining to certain principles of Behaviorism . The unexpected results of this study offer some small endorsement to the conception that attempts to predict human response on the basis of systematic manipulation of external reinforcement is difficult even when certain personality characteristics are taken into account.

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TABLE 1

Means and standard deviations for average response latencies for the three feedback condition.

	<u>NEUTRAL</u>	<u>APPROVING</u>	<u>DISAPPROVING</u>
MEANS	4.66	5.15	5.69
STANDARD DEVIATIONS	1.92	2.12	2.96

TABLE 2

Means and standard deviations for average response latencies for the two personality conditions high or low score on the M-C SD scale.

	<u>HIGH M-C SD</u>	<u>LOW M-C SD</u>
MEANS	5.24	5.10
STANDARD DEVIATIONS	2.12	2.48

TABLE 3

Means and standard deviations for average response latencies for the two concept attainment tasks.

	<u>CONJUNCTIVE</u>	<u>DISJUNCTIVE</u>
MEANS	5.48	4.86
STANDARD DEVIATIONS	2.57	2.13

TABLE 4

Means and standard deviations for average response latencies of the two personality groups under the three feedback condtions.

		<u>HIGH M-C SD</u>	<u>LOW M-C SD</u>
NEUTRAL	MEANS	5.11	4.21
	STANDARD DEVIATIONS	2.03	1.75
APPROVING	MEANS	5.16	5.15
	STANDARD DEVIATIONS	1.81	2.37
DISAPPROVING	MEANS	5.45	5.93
	STANDARD DEVIATIONS	2.58	3.35

TABLE 5

Means and standard deviations for average response latencies of the two tasks under the three feedback conditions.

		<u>CONJUNCTIVE</u>	<u>DISJUNCTIVE</u>
NEUTRAL	MEANS	5.02	4.31
	STANDARD DEVIATIONS	1.60	2.06
APPROVING	MEANS	5.41	4.90
	STANDARD DEVIATIONS	1.82	2.13
DISAPPROVING	MEANS	6.01	5.37
	STANDARD DEVIATIONS	1.81	3.01

TABLE 6

Means and standard deviations for average response latencies for the two personality conditions with the two tasks.

		<u>CONJUNCTIVE</u>	<u>DISJUNCTIVE</u>
HIGH M-C SD	MEANS	5.58	4.89
	STANDARD DEVIATIONS	2.23	3.07
LOW M-C SD	MEANS	5.37	4.82
	STANDARD DEVIATIONS	2.79	3.32

TABLE 7

Means and standard deviations for average response latencies of the two personality groups under the three feedback conditions for the two tasks.

			<u>CONJUNCTIVE</u>	<u>DISJUNCTIVE</u>
NEUTRAL	HIGH M-C SD	MEANS	5.51	4.71
		STANDARD DEVIATIONS	2.34	1.69
	LOW M-C SD	MEANS	4.52	3.91
		STANDARD DEVIATIONS	2.12	1.30
APPROVING	HIGH M-C SD	MEANS	5.25	5.06
		STANDARD DEVIATIONS	1.55	2.11
	LOW M-C SD	MEANS	5.57	4.73
		STANDARD DEVIATIONS	2.53	2.20
DISAPPROVING	HIGH M-C SD	MEANS	5.99	4.91
		STANDARD DEVIATIONS	2.80	2.33
	LOW M-C SD	MEANS	6.03	5.84
		STANDARD DEVIATIONS	3.68	3.14

TABLE 8

Means and standard deviations for trials to solution for the three feedback conditions.

	<u>NEUTRAL</u>	<u>APPROVING</u>	<u>DISAPPROVING</u>
MEANS	17.69	26.52	18.52
STANDARD DEVIATIONS	20.19	22.72	19.20

TABLE 9

Means and standard deviations for trials to solution for the two personality conditions high or low score on the M-C SD scale.

	<u>HIGH M-C SD</u>	<u>LOW M-C SD</u>
MEANS	21.07	20.75
STANDARD DEVIATIONS	18.75	22.23

TABLE 10

Means and standard deviation for trials to solution for the two concept attainment tasks.

	<u>CONJUNCTIVE</u>	<u>DISJUNCTIVE</u>
MEANS	12.21	29.61
STANDARD DEVIATIONS	9.09	24.31

TABLE 11

Means and standard deviations for trials to solution of the two personality groups under the three feedback conditions.

		<u>HIGH M-C SD</u>	<u>LOW M-C SD</u>
NEUTRAL	MEANS	13.88	21.50
	STANDARD DEVIATIONS	15.84	22.74
APPROVING	MEANS	32.17	21.72
	STANDARD DEVIATIONS	23.75	21.72
DISAPPROVING	MEANS	17.17	19.88
	STANDARD DEVIATIONS	16.52	21.91

TABLE 12

Means and standard deviations for trials to solution of the two tasks,  
under the three feedback conditions.

		<u>CONJUNCTIVE</u>	<u>DISJUNCTIVE</u>
NEUTRAL	MEANS	10.75	24.63
	STANDARD DEVIATIONS	8.11	25.63
APPROVING	MEANS	16.04	27.00
	STANDARD DEVIATIONS	10.01	24.60
DISAPPROVING	MEANS	9.83	27.21
	STANDARD DEVIATIONS	9.01	22.36

TABLE 13

Means and standard deviations for trials to solution for the two personality conditions with the two tasks.

		<u>CONJUNCTIVE</u>	<u>DISJUNCTIVE</u>
HIGH M-C SD	MEANS	13.36	28.78
	STANDARD DEVIATIONS	11.41	24.36
LOW M-C SD	MEANS	11.06	30.44
	STANDARD DEVIATIONS	8.98	23.75

TABLE 14

Means and standard deviations for trials to solution of the two personality groups under the three feedback conditions for the two tasks.

			<u>CONJUNCTIVE</u>	<u>DISJUNCTIVE</u>
NEUTRAL	HIGH M-C SD	MEANS	10.08	17.67
		STANDARD DEVIATIONS	9.25	20.19
	LOW M-C SD	MEANS	11.42	31.58
		STANDARD DEVIATIONS	10.17	27.30
APPROVING	HIGH M-C SD	MEANS	20.50	43.83
		STANDARD DEVIATIONS	11.84	27.24
	LOW M-C SD	MEANS	11.58	30.17
		STANDARD DEVIATIONS	11.43	25.84
DISAPPROVING	HIGH M-C SD	MEANS	9.50	24.83
		STANDARD DEVIATIONS	8.21	19.37
	LOW M-C SD	MEANS	10.17	29.58
		STANDARD DEVIATIONS	7.17	27.32

TABLE 15Analysis of Variance for the dependent measure Average Response Latency

<u>SOURCE</u>	<u>S.S.</u>	<u>d.f.</u>	<u>M.S.</u>	<u>F</u>
A (Feedback Conditions)	25.60	2	12.80	-
B (M-C SD scale)	0.67	1	0.67	-
C (Tasks)	13.89	1	13.89	-
AB	11.74	2	5.87	-
AC	0.25	2	0.12	-
BC	0.18	1	0.18	-
S(AB)	512.72	66	7.77	-
ABC	3.59	2	1.80	-
SC(AB)	247.64	66	3.75	-

TABLE 16

Analysis of Variance for the dependent measure Trials to Criterion

<u>SOURCE</u>	<u>S.S.</u>	<u>d.f.</u>	<u>M.S.</u>	<u>F</u>
A (Feedback Conditions)	2,283.56	2	1,141.78	3.18*
B (M-C SD scale)	3.67	1	3.67	-
C (Tasks)	10,902.84	1	10,902.84	30.85**
AB	2,312.06	2	1,156.03	3.22*
AC	301.06	2	150.53	-
BC	142.01	1	142.01	-
S(AB)	23,685.04	66	358.86	-
ABC	450.72	2	225.36	-
SC(AB)	23,328.88	66	353.47	-

\*  $p < .05$   
 \*\*  $p < .001$

