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Cognitive Dissonance as a Function of Internal-External Locus of Control

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COGNITIVE DISSONANCE AS A FUNCTION OF INTERNAL-EXTERNAL LOCUS OF CONTROL

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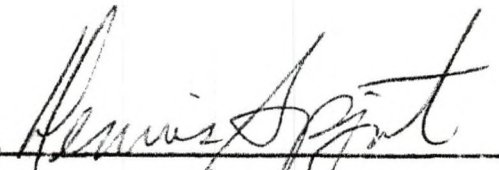
Signature 

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ABSTRACT

According to cognitive dissonance theory engaging in behavior inconsistent with one's beliefs arouses dissonance. When individuals choose to engage in a boring and repetitious task they tend to positively reevaluate the task. Recent research (Pallak, et al. 1967) using an incidental verbal learning paradigm indicates that subjects who voluntarily commit themselves to performing a boring task reduce dissonance via enhanced task performance rather than through positive task reevaluation. Both the arousal of dissonance and its reduction can be expected to vary with individual differences. The present study investigated the individual differences of sex and internal-external locus of control as related to cognitive dissonance.

Casual observation of subjects in experiments have indicated that those individuals who tend to perceive events and reinforcements as being determined by factors under their control (Internals) evidence greater interest in their surroundings and in tasks in which they involve themselves than do those individuals who tend to perceive events and reinforcements as being determined by choice or factors extrinsic to themselves (Externals). This study was a 2 X 2 X 2 design with personality (I-E), sex, and choice-

no choice as the independent variables. The dependent variables were the number of incidentally recalled words in a situation where the subjects were instructed to copy words but received no instructions to retain the words, and attitudes towards the task.

The data obtained did not support the hypotheses regarding task reevaluation or incidental learning. That is, there were no statistically significant differences in attitude toward the task or in incidental learning as a function of sex, I-E, or choice. There was evidence indicating that the task used in this study may not have fulfilled the forced-compliance paradigm's theoretical requirement of unequivocal aversiveness. It is not so surprising, therefore, that measures which are considered to be sensitive to differential dissonance reflected no such differences. Recall of words in an incidental learning paradigm showed a curvilinear relationship to concreteness and a strong recency effect.

CHAPTER I

INTRODUCTION

Although several theories dealing with cognitive consistency were introduced into psychological theorizing within a short period of time (e.g., Heider's (1944) balance theory, Osgood and Tannenbaum's (1955) congruity theory), it was Festinger's book, "A Theory of Cognitive Dissonance" (1957), that caught the attention and imagination of a large number of researchers. Festinger's cognitive dissonance theory appears to be the most productive social psychology theory to date. As an indication of its productivity, Margulis and Songer (1969) were able to present a bibliography including "319 separate, published, theoretical, critical and/or research publications on cognitive dissonance theory (p. 923)" which appeared in print during the years 1957-1967. A casual perusal of the journals since 1967 indicates that articles are appearing at least as frequently as they appeared during that first decade.

It is with the theory of cognitive dissonance as it relates to the internal-external locus of control personality

construct and incidental learning that the present investigation is concerned. This chapter will present a brief overview of dissonance research and a more complete discussion of the internal-external personality dimension and incidental learning.

THEORY OF COGNITIVE DISSONANCE

As Festinger (1957) stated, the core of dissonance theory is extremely simple. It holds that: (1) Dissonant or "nonfitting" relations may exist among cognitive elements. (2) The existence of dissonance gives rise to pressures to reduce the dissonance and to avoid further increases in dissonance. (3) Manifestations of these pressures include behavior changes, changes in cognition, and circumspect exposure to new information and new opinions. In other words, if an individual holds two cognitions--opinions, beliefs, attitudes, ideas-- that are inconsistent, he will experience psychological discomfort. Two cognitions are considered to be inconsistent, therefore dissonant, if the opposite of one of them follows from the other (Aronson, 1968). The discomfort the individual experiences will motivate him to try to reduce the dissonance; that is, he will attempt to establish "fitting" relations among the cognitive elements.

Research in dissonance theory has been classified into three major categories (Festinger, 1957; Brehm and Cohen, 1962): free-choice studies, exposure-to-information studies, and forced-compliance studies. In the free-choice situation individuals choose between alternatives which usually are seen as differing minimally in attractiveness. Dissonance is said to be aroused by and is a function of the attractive elements of the rejected alternative. That is, an individual experiences dissonance between the cognitions "the rejected alternative is attractive" and "I didn't choose it." Dissonance also arises from the cognitions "the chosen alternative has negative aspects" and "I chose it." To reduce dissonance in this situation, individuals generally emphasize the positive aspects and deemphasize the negative aspects of the chosen alternative while emphasizing the negative and deemphasizing the positive aspects of the unchosen alternative (Aronson, 1968).

Exposure-to-information studies entail subjects being exposed to information which is discrepant with their prior attitudes, beliefs or information. In this type of study four basic propositions have been tested: They are: (1) People seek supportive information. (2) People avoid nonsupportive information. (3) With increased dissonance

both tendencies occur more frequently. (4) Both tendencies occur more frequently when the individual has little confidence in his initial opinion. Exposure-to-information research has been reviewed by several authors (e.g., Freedman and Sears, 1965; Katz, 1968; Mills, 1968; Sears, 1968). Freedman and Sears, for example, conclude that the available evidence does not support the contention that people generally seek out supportive information and avoid nonsupportive information.

In the forced-compliance situation an individual chooses between engaging or not engaging in some act or behavior which is discrepant with his prior attitudes or beliefs. Several research studies, for example, have dealt with the concept of inadequate justification for engaging in the discrepant behavior. In this type of study the subjects have been given the choice of performing or not performing a dull and repetitious task with little justification (e.g., Freedman, 1963). This type of study has usually found that those who choose to perform the dull and repetitious task subsequently evaluate the task in a more favorable fashion than those who were given no choice and forced to engage in the activity. Deciding to engage in such an activity, of course, requires that an individual commit himself in some manner.

Brehm and Cohen (1962) cite several studies which emphasized the role of perceived degree of choice in committing oneself to performing the discrepant behavior. They concluded that dissonance is dependent upon the degree of choice individuals perceive in making their commitment. Brock (1968) also concluded that volition is more effective than other determinants of dissonance arousal.

Another example of this general type of research design is the experiment which involves the subjects either preparing or presenting a communication which is discrepant with their beliefs. Probably the best known study in this area is that of Festinger and Carlsmith (1959) in which subjects were "hired" for either $20.00 or $1.00 to tell the next subject (actually a stooge) that the dull and repetitious task they had just performed was enjoyable and interesting. The subjects who were paid less expressed a significantly more favorable attitude toward the dull and boring task than those who were paid more. Using rewards of smaller denomination, Cohen (1962) obtained similar results in an experiment in which subjects wrote an essay discrepant from their point of view. Also, Lependorf (1964) found more attitude change following a bribe of five cents than following one of fifty cents.

CRITICISMS OF THE THEORY

Cognitive dissonance theory and research based on derivations from it have been subjected to a great deal of criticism. Some of these questions stem from the generality of the statements of various aspects of the theory, while other criticisms have been leveled at general methodology and interpretation of the data. Several statements in Festinger's book (1957) have been viewed suspiciously. For example, in one place he says "where no dissonance exists there should be a relative absence of motivation to seek supportive or new information at all (p. 30)." This is in direct opposition to the body of research evidence accumulated by such workers as Berlyne (1960, 1965) regarding curiosity motivation.

Brehm and Cohen (1962) anticipated a possible criticism of dissonance theory to the effect that dissonance theory is actually no different from conflict theory as developed by Miller (1944). In their analysis of the two theories they pointed out that conflict theory appears to deal with pre-decision phenomena, while dissonance theory is relevant to post-decision phenomena. Two studies dealing with this issue (Davidson and Kiesler, 1964; Jecker, 1964) conclude that reevaluation of alternatives takes place post-

decisionally. Cognitive dissonance theory, then, deals with attempts to reduce dissonance or discomfort following decisions.

Probably the best known critique of the theory of cognitive dissonance is that of the Chapinises (Chapanis and Chapanis, 1964). They raised two general criticisms of the theory. First, they noted that cognitive dissonance is an intervening variable concept which is dependent upon the internal cognitions of a person. In some cases they questioned whether the experimenters had actually aroused dissonance and in other cases they felt that other nondissonant cognitions might better explain the results. The second general criticism that the Chapanises leveled at the then available research was primarily methodological in nature. They cited studies containing sampling bias errors and studies in which the researcher conducted multiple *t* tests on the same data, thus affecting the per comparison error rate.

In their analysis of the Aronson and Mills (1959) study, the Chapanises used the argument that data cited by dissonance researchers can be interpreted by relying on intervening variables other than cognitive dissonance. In this study, volunteer female subjects underwent an initiation test,

reading descriptively erotic passages in the presence of a male experimenter, in order to participate in a group discussion on the psychology of sex. The discussion itself was designed to be rather dull and uninteresting. Aronson and Mills found that those subjects who underwent the more severe initiation subsequently evaluated the group discussion more favorably than did the mild initiation subjects. Chapanis and Chapanis felt that the findings were determined by a feeling of successful accomplishment on the part of the severe initiation group, and argued that "there is no need to postulate a drive due to dissonance if a pleasure principle can account for the results quite successfully (p. 5)." Aronson (1968) cites research conducted by Gerard and Mathewson (1966) as a refutation of the Chapanises' argument. Gerard and Mathewson conducted a study similar to that of Aronson and Mills, except they used severe and mild shock as initiation before the subjects were exposed to a taped group discussion. Their findings definitely supported dissonance theory. Aronson concluded that the two experiments taken together "eliminate most possible alternative explanations (p. 13)."

In a recent paper, Bem (1967) took the position that "the appeal to hypothetical internal states of the organism

for causal explanations of behavior is often heuristically undesirable (p. 198)." He suggested that data obtained in cognitive dissonance research is explicable in terms of self-descriptive attitude statements based upon the individual's observations of his own behavior and the conditions under which it occurs. Bem presented several replications of dissonance research utilizing this concept of self-perception, which appear to support his contention.

The Chapanises' second criticism of cognitive dissonance research, the presence of methodological inadequacies, also bears consideration. They pointed out that when subjects are rejected without explanation from the analyses of the data, conclusions are subject to skepticism. In addition, in the forced-compliance design subjects frequently refuse to participate. These two factors may bias the results. An adequate number of control groups and some measure on subjects refusing to participate would obviate this criticism. Another frequent methodological inadequacy, multiple *t* tests, can be obviated by utilization of techniques discussed by Winer (1962) and others for conducting a posteriori tests.

In his review of exposure to information studies, McGuire (1968) noted that although the evidence for the

critical selective avoidance prediction is quite poor, none of the researchers has completely rejected the postulate. While many researchers attribute their nonsupporting data to the presence of confounding variables, McGuire caustically concluded that this only shows that "with determination and a little ingenuity one can survive experimental disconfirmations with one's hypothesis still intact (p. 799)." He does not feel that all this research was futile, however, since "at worst, it may have served to demonstrate that the selective exposure postulate is invalid (p. 800)." He suggested that future research should be directed toward the broader question of the tactics of perceptual selectivity rather than the question of defensive avoidance.

INDIVIDUAL DIFFERENCES AND COGNITIVE DISSONANCE

Festinger (1957) surmised that individuals likely differ in their reactions to situations producing dissonance. A number of studies have been directed at elucidating the relationships between individual differences and cognitive dissonance. In a study dealing with alternative responses to dissonance, Steiner and Rogers (1963) obtained correlations between Minnesota Multiphase Personality Inventory (MMPI) scales and responses to dissonance. Subjects could resolve

dissonance by conforming to contrary judgments, rejecting the source of the contrary judgments, underrecalling the disagreements, or devaluating the importance of the topics of disagreement. Their approach was a somewhat loosely structured attempt at isolating individual differences in the resolution of dissonance. Of the ninety correlations obtained between MMPI scales and responses to dissonance, only three reached a probability level of .05. These results would be anticipated on a chance basis alone! Steiner and Rogers also reported that Manifest Anxiety Scale (MAS) scores correlated positively with conformity and tolerance of dissonance and negatively with rejection for female subjects. For males MAS scores were negatively correlated with underrecall. In their dissonance producing situation where individuals could conform, reject, devaluate, or forget in order to reduce dissonance, anxious males avoided the use of underrecall while anxious females avoided rejection. Anxious males didn't emphasize any single response method, while females tended to conform or to tolerate dissonance. Steiner (1960), in an earlier study, also observed marked sex differences in preference for responses which might reduce dissonance.

Crowne and Marlow (1964) reported a study which used the same task, spool packing for a twenty-five minute period, as that used in the Festinger and Carlsmith study. Following this monotonous task, the subjects were given an opportunity to evaluate the task. Crowne and Marlow found, as they had predicted, that individuals with high need for approval expressed a more favorable attitude toward the task than did subjects with a lower need for approval. Although Crowne and Marlowe did not have choice and no-choice conditions in their study, therefore not a strict dissonance situation, the relationship of their study to the exploration of the relationship between individual differences and cognitive dissonance can readily be seen. It would be worthwhile to replicate their study using choice and no-choice conditions.

In his paper on individual differences and resolution of cognitive dissonance, Glass (1968) developed a theoretical approach in which he predicted that repressors and sensitizers, as measured by Byrne's (1961) Repression-Sensitization (R-S) scale, would differ in their response to inconsistency. He subsequently reported a study (Glass, Canavan, and Schiavo, 1968) which indicated that sensitizers were better able to tolerate feelings of tension and anxiety, and were more likely to hold incongruent percepts than were repressors. Hamil-

ton (1969) recently reported a study in which he explored the relationship between scores on the R-S scale and resolution of dissonance. In his study, the response measure of underrecall seemed to be most relevant to the R-S dimensions, in that people may differ in the extent to which they attempt to avoid or repress inconsistencies. Although the mean differences in his study were in the predicted direction, with repressors obtaining higher underrecall scores than sensitizers, they were not statistically significant.

Using the embarrassment test devised by Aronson and Mills (1959), Fillenbaum (1964) obtained a significant correlation between dogmatism and amount of dissonance reduction. There was also a tendency for the dogmatic subjects to rate themselves as being more embarrassed. However, the correlation obtained for the control group was higher than for the experimental group, so Fillenbaum was forced to state that the question of dogmatic subjects being less able to tolerate inconsistency was still open. Crano and Sigal (1968) found that highly dogmatic subjects resolved conflicting information in an internally consistent manner when they were exposed to an attitudinally discrepant communication. Undogmatic subjects were much more inconsistent in resolving dissonance. Hunt and Miller (1968) instructed their subjects

to advocate a belief-discrepant position. They concluded that closed-minded subjects demonstrated greater attitude change in the direction of the advocated belief than did open-minded subjects.

Bishop (1967) explored the hypothesis that anal characters, anal-retentive as measured by Grygier's (1956) Dynamic Personality Inventory, would not conform to predictions based on dissonance theory but would instead make judgments based on internalized standards. He used the Festinger-Carlsmith task in which individuals are paid to tell another subject that the dull and boring task they have just completed is interesting and enjoyable. In addition, Bishop's subjects participated in a rigged lottery which initially led them to expect payment of $20 for telling the next subject that the boring task was interesting. Later, they were forced to relinquish either $1 (low privation) or $19 (high privation). Bishop's prediction that attitudes expressed by high anal subjects would contradict a dissonance theory prediction were confirmed. High anal subjects under conditions of dissonance and high privation responded to the boring task by expressing a more disgruntled attitude than did low anal subjects.

Christie (1962) developed a scale, the Mach Scale, containing statements relevant to a Machiavellian philosophy.

High Mach scorers agree with the statements and are regarded as not being concerned with conventional morality. Epstein (1967) reasoned that the task of advocating a position contrary to one's own belief would be less dissonant for high Mach subjects than for low Mach subjects. This prediction was confirmed in a role-playing situation. However, when subjects were exposed to a persuasive communication, high Mach subjects showed greater opinion change than did low Mach subjects. In another study using the Mach scale (Bogart, 1968), high Mach subjects frequently avoided dissonance by refusing to cheat with a low prestige partner. Low Mach subjects showed no such difference in avoiding dissonance producing conditions. In interpreting the results obtained from all those subjects who did choose to enter the dissonance producing situation (cheating), Bogart concluded that high Mach subjects don't feel dissonance as readily, are better able to tolerate dissonance, or reduce dissonance differently than do low Mach subjects. Until research techniques are designed so that these alternatives can be discriminated, similar suggestions could be made for any research indicating individual differences are influential in a dissonance producing situation.

INTERNAL-EXTERNAL LOCUS OF CONTROL

James (1957, 1965) suggested that learning tasks can be ordered according to the degree that reinforcements are controlled by the subject or by external factors. He also suggested that people are describable in terms of their generalized perception of reinforcement as being either a function of luck or chance, or dependent upon factors intrinsic to oneself. The James Internal-External (I-E) scale is a measure of the extent to which a person perceives himself as controlling his reinforcements. The scale consists of thirty scored items plus filler items. The test is scored in the external direction and scores may range from zero to ninety. A high score indicates that a person is externally oriented and perceives events and their reinforcements as being determined by fate or chance. Those with low scores tend to consider events and their reinforcements as being under their own control. The scale does not appear to be affected by response sets since correlations between filler and relevant items are nonsignificant. In addition, correlations with the Crowne-Marlowe Social Desirability Scale are minimal. James (1957) found split-half reliabilities between .84 and 96, and retest reliabilities between .71 and .86. The mean for intro-

ductory psychology students is approximately 40 with a standard deviation of approximately 10. There is no significant sex difference on the scale.

The I-E personality dimension has been useful in differentiating various groups. For example, several studies (Lefcourt and Ladwig, 1965a and b; Battle and Rotter, 1963; Graves, 1961) have shown that Negroes are more externally oriented than whites. Other research (Gore and Rotter, 1963; Strickland, 1965; Carlson, James and Carriere, 1965) has indicated that social activists are more internally oriented than non-activists.

In a study by Julian, Lichtman, and Ryckman (1968), subjects were placed in a situation where they had little control over their performance; they were blindfolded prior to a dart-throwing contest. Externally-oriented subjects expressed a greater degree of embarrassment, irritation, and distraction than did internally-oriented subjects. Although this was opposite to the researcher's predictions, the results can be interpreted as showing that Externals are more easily frustrated under chance conditions, while Internals are more easily frustrated under skill conditions. This interpretation receives support from an earlier study conducted by Rotter and Mulry (1965), who measured decision times for

Internals and Externals in both a skill-defined task and a chance-defined task. They interpreted the interaction effect they obtained as indicating that Internals were more highly motivated in the skill task while Externals were more highly motivated in the chance task. Although neither of the above studies allowed subjects a choice to participate or not, it would be interesting to attempt replications with both choice and no-choice conditions. Casual observations of Internals and Externals in experimental situations indicates that, generally, Internals are more interested in the task they are involved in than are Externals. It would seem, then, that under choice conditions, externally-oriented subjects would engage in positive reevaluation of a boring task, while internally-oriented subjects would likely show no alteration in their evaluations, since they generally find interesting aspects in whatever situation they find themselves.

Festinger (1957) used the example of an individual who believes that cigarette smoking causes cancer but continues to smoke as an illustration of a dissonance producing situation. In order to reduce this dissonance the individual can either quit smoking or else work on the other cognition; i. e., that cigarette smoking causes cancer. Relevant to this discussion is research conducted by Straits and Sechrest (1963)

and James, Woodruff, and Werner (1965) relating the I-E personality dimension to smoking behavior. Straits and Sechrest found that nonsmokers were significantly more internally-oriented than were smokers. James, et al. (1965) obtained the same results and, in addition, found that those male smokers who found the Surgeon General's report on smoking credible and subsequently stopped smoking had significantly lower external control scores than those who were not convinced by the report and did not stop smoking. This would seem to indicate that individuals who are internally-oriented tend to reduce the dissonance aroused by the discrepancy between the fact that they smoke and the knowledge that smoking causes cancer by taking direct action on their overt behavior. In like manner it could be argued that externally oriented individuals tend to reduce dissonance by altering their covert cognitions.

Of relevance to the present study is research evidence which indicates that Internals are more likely to be better informed and more aware of their surroundings than are Externals. The Gore and Rotter (1963) results could be interpreted as support for this conclusion. Carlson, et al., (1965) also found that internally oriented subjects possessed more information about Viet Nam and the United States' in-

volvement there than did externally oriented subjects. Seeman and Evans (1962) found that tubercular patients whose scores were in the internal range were better informed about tuberculosis in general and knew more specifics about their own condition than did those patients scoring in the external direction. Additional support for the conclusion comes from studies employing an incidental learning paradigm (Seeman, 1963; Spjut and James, 1969).

INCIDENTAL LEARNING

Incidental learning (INC) can be operationally defined as learning which occurs when subjects receive no instructions to learn the material for which retention will be tested, while intentional learning (INT) can be defined as learning which takes place when subjects are instructed to learn the material for which retention will be tested (Postman, 1964). McLaughlin (1965) maintains that differences between INT and INC are quantitative in nature rather than qualitative. Postman (1964) also stated that free recall following INT and INC is describable by the same set of principles. Although INC may be less efficient than INT, Berlyne (1960) is of the conviction that what can be called incidental learning makes up the majority of man's learning experience.

INC has been explored as a function of various experimental and subject variables; McLaughlin's extensive review (1965) covers much of this literature. He cites research evidence that INC is a function of such experimental variables as practice, amount of material, exposure time, and serial position. The meaningfulness of the learning material has received a great deal of experimental attention. McLaughlin concluded: "The slope of the functions relating meaningfulness to recall is consistently steeper under INC than under INT conditions (p. 368)." That is, the lower the association value of the stimuli the greater the differences between INT and INC.

INC has also been explored as a function of individual differences. While Cohen and Nelson (1965) found no significant sex differences in INC, both Cohen (1966) and Sp[illegible] and James (1969) found that females show significantly more INC than do males. Cohen and Nelson were also led to the tentative conclusion that personality differences account for some of the differences they noted in INC. In a follow-up study, Cohen (1966) correlated INC and the personality traits measured by the Guilford-Martin Inventory of Factors. The obtained correlations were not very promising. More impressive results were obtained in the research relating INC and

the variable field-dependence. Messick and Damarin (1964) found that field-dependent subjects showed significantly better incidental recall of photographs than did field-independent subjects. Using incidental presentation of words conveying social implications, Fitzgibbons, Goldberger and Eagle (1965) found that field-dependent subjects showed greater recall than did field-independent subjects.

Using an INC paradigm, Seeman (1963) found that internally-oriented subjects showed greater retention than did externally-oriented subjects. He used a reformatory population where inmates rated information regarding the immediate reformatory situation, parole information, and long range opportunities as being interesting or not interesting. Following this rating procedure, the subjects were tested for retention of the information. The results supported the conclusion that Internals are more likely to gather information from their environment than are Externals.

Spjut and James (1969) conducted a more direct study of the relationship between I-E and INC. In their study the major dependent variable was the number of incidentally learned items in a situation where university students were instructed to learn a list of words but received no instructions to learn the two-digit numbers which accompanied each

word. The words were ten nouns randomly selected from the Thorndike-Lorge list which were of equal concreteness, imagery and meaningfulness as determined by Paivio, Yuille, and Madigan (1968). They were paired with randomly selected two-digit numbers and projected onto a screen. At the end of each trial subjects were allowed time to free recall the words. The dependent variable for incidental learning was the number of correctly recalled numbers following the final recall period. The results supported the prediction that Internals would show greater incidental learning than would Externals.

Research exploring the relationship between INC and motivation has yielded a complex picture of the role that motivation plays. Motivation can be conceptualized as stemming from various sources such as monetary incentive, anxiety conceived as a drive state (as measured by the Taylor MAS), the intentional arousal of emotional responses via differing instructions, or cognitive dissonance. Apparently the type of results to be expected vary depending on which of the various theoretical conceptions of motivation the experimenter chooses to use (McLaughlin, 1965). For example, Paradowski (1967) argues that aversive stimulation serves to reduce INC due to a reduction in the range of cue utilization while

an increase in the range of cue utilization occurs with arousal conditions which are characterized by positive affect and interest. In an experiment using pictures of "common" and "novel" animals on different backgrounds with different colored borders, he found that both INT and INC were significantly increased for the novel material. He attributed the increase to curiosity arousal.

Weick (1964) suggested that individuals may reduce dissonance by enhancing their task performance as well as by positively evaluating the task. Waterman and Katkin (1967) explored the dynamogenic effect of dissonance. They found that dissonance facilitated performance on both simple and complex digit symbol tasks. As compared to Weick's suggestion that dissonance arousal leads both to task enhancement and task reevaluation, Pallak, Brock and Kiesler (1967) and Pallak and Kiesler (1968) suggested that subjects may avoid dissonance rather than reduce it via reevaluation. Their experiments entailed giving subjects either high choice (high dissonance condition) or low choice (low dissonance condition) to perform a dull paired-associate copying task. Although the subjects were not instructed to retain the paired-associates, a measure of retention was obtained at the end of the experiment. They, therefore, were using an

INC paradigm. Their results confirmed their preduction that more paired-associates would be retained by the high-choice subjects than by the low-choice subjects. That is, subjects experiencing high cognitive dissonance showed greater INC than did subjects in the low dissonance condition.

PURPOSE

The purpose of the present study was to examine the relationships between cognitive dissonance, individual differences, and INC. The individual difference variables were sex and I-E classification. The subjects were given either high-choice (high dissonance) or low choice (low dissonance) to continue to participate in a word-copying task conceptualized as being dull and boring. Attitude and INC measures were obtained after the copying task was completed. The words employed varied in concreteness and serial position, permitting an analysis of these variables in relation to INC.

Several hypothesis were formulated on the basis of the literature and previous experimentation by the writer. These are:

Hypothesis I: Internals will evaluate the task equally favorably under both choice conditions; Externals will evaluate the task more favorably in the high-choice condition than in the low-choice condition.

Hypothesis II: Internally-oriented subjects will show more INC than externally-oriented subjects.

Hypothesis III: Females will show more INC than males.

Hypothesis IV: A curvilinear relationship will be obtained between concreteness and recall, with the most abstract and the most concrete words recalled better than words of intermediate character.

Hypothesis V: A strong recency effect will appear in the serial position analysis of recall.

CHAPTER II

METHOD

Subjects

The subjects used in the present study were enrolled in the introductory psychology course at the University of North Dakota. Each student enrolled in the course had taken the James I-E scale, called the DeKalb Student Opinion Survey-Form I-E, at the beginning of the semester. Subjects were selected on the basis of their I-E scores. Only subjects whose scores deviated approximately 1.0 standard deviation from the mean were used. Externals had scores of 48 or higher and Internals had scores of 32 or lower. Subjects were contacted by phone relative to participation in the study. Those who participated in the study received credit to fulfill the research requirement for the course. If they already had earned the required number of research credits they were allowed extra credit.

Material and Apparatus

Nouns used in the experiment were obtained from Paivio, Yuille and Madigan (1968), who presented concreteness-abstractness values for 925 nouns. The values were obtained

from subjects who rated each word on seven-point scales. Four sets of 45 words each were made. The words were selected to represent four different levels of concreteness. Levels are defined by the following ranges on the seven point scale: 1.18-2.20 (most abstract), 3.00-4.00, 5.00-600, 6.76-7.00 (most concrete). Each set contained 24 words of AA or A frequency and 21 words of lower frequency.

The words were typed on onion skin paper from which slides were made. The order of presentation of the complete list of 180 words was randomized with the stipulation that each consecutive group of 12 words contain 3 words from each set. A Kodak Carousel 800 slide projector was used to project the stimuli onto a screen. The projector was operated automatically so that a different slide was projected each 5 sec. Total projection time was 15 minutes.

Design and Procedure

The present study was a 2 X 2 X 2 factorial design. The independent variables were choice-no choice, sex, and personality (I-E). Eighty subjects participated in the study in groups ranging in size from 8 to 17. Subjects were randomly assigned to either the choice or the no-choice condition and the following instructions were read to them.

This is part of an experiment dealing with developing ways of studying handwriting. It has been found that in order to analyze a person's handwriting completely, a fairly large sample of his handwriting is required. This sample should include many letter combinations and words, and yet this sample should be obtained in a controlled and scientific manner. This is why a projector which projects words automatically and for a specified time period has been selected for this experiment. All that is required of you is that you copy the words as they are projected onto the screen into a little booklet provided for this purpose. There are ten lines per page and you should write just one word per line. Throughout the entire experiment try to write each word as naturally as possible. When you have filled any one page in the booklet, fold it back and continue on the next page. A very long list of words is being used in this experiment and some groups of students have described the task of copying the words as very monotonous due to the length of the word list. Others have thought the task of copying the words was dull and uninteresting. In spite of this do your best to write as naturally as possible.

Please do not talk at all during the entire experiment.

After 10 slides had been presented the projector was stopped and, depending on the group, the following instructions were read.

Choice

You have fulfilled your research requirement by reporting for the experiment and participating this far. Further participation is not required in order for you to receive your research credit. You are under no further obligation to remain and you can leave now if you wish (pause). Some previous subjects have chosen to leave at this time and you have the same right to make that decision (pause). Do you want to continue? Are you sure?

No choice

In previous research with this same task some groups of subjects were given the choice to leave or to continue at this point. They could do so and still receive research credit for participating in the experiment. You will NOT be given that choice. In order for you to receive your research credit for participating in this experiment you are required to stay and complete it. I want to emphasize that you are obligated to continue at this time.

Following the reading of the choice or no-choice instructions, the task continued for the no-choice group and for those in the choice group who chose to remain. Provision was made so that subjects from the choice group would fill out forms similar to those all other subjects filled out at the end of the copying task. After all subjects had completed the attitude questionnaire (see Fig. 1), administered at the end of the copying task, they were requested to write down all the words that they could remember. They were encouraged to guess. Following this, all subjects in the choice condition were requested to write their reason(s) for staying when they were given the choice of leaving and still receiving research credit.

INSTRUCTION

To answer the questions, make a mark on the line at the point which represents your true feelings. The labelled points are provided to serve as a guide for your judgments. Your marks do not have to be at any one of the labelled points unless one of these points actually represents your feelings. Feel free to use any point of the line.

1. Considering that you volunteered for this experiment, how much choice did you feel that you had to complete the experiment or to leave without completing it?

---

complete choice very much choice some choice very little choice no choice

2. Was the task involved in this experiment interesting or was it boring?

---

extremely boring very boring somewhat boring neither interesting nor boring somewhat interesting very interesting extremely interesting

3. How do you feel about having taken part in this experiment?

---

extremely satisfied moderately satisfied neither satisfied nor dissatisfied moderately dissatisfied extremely dissatisfied

Fig. 1.--Attitude Questionnaire

CHAPTER III

RESULTS

Attitude Measures

Perceived choice means, standard deviations, and three-way analysis of variance are shown in Table I. It can be seen that the choice instructions were effective. Individuals who were told that they had the choice to leave the experimental setting perceived a significantly greater freedom of choice than did those subjects who were told they had no choice to leave and had to remain in the experimental setting. While the individuals who were told they had the choice to leave did perceive this choice, it is remarkable that not one of them actually did leave. Subsequent to the gathering of all the dependent measures, the individuals in the choice condition were requested to give their reason(s) for staying when they had been given the choice to leave. Each subject gave at least one reason for staying. The reasons given included curiosity and interest in the experiment, a feeling that he had nothing else to do, a feeling he wasn't a quitter, a feeling that he had already expended effort to get to the experiment, and a feeling that he

should work longer to deserve receiving his research credit. It is interesting to note that of the 24 responses including a reference to an interest or curiosity regarding the experiment, internally-oriented Ss gave 16, while externally-oriented Ss gave only 8. Only one subject made reference to a feeling of group pressure and a need to conform, and then only following a statement regarding his curiosity.

A second look at Table I indicates that both the I-E factor and the Sex X I-E interaction effect also reached significance. It can be seen that Internals perceived a greater degree of freedom than did Externals in both the choice and no-choice conditions. In addition, for both the choice and no-choice conditions and for all groups male Internals perceived the greatest freedom of choice, while male Externals perceived the lowest freedom of choice. The males provide the greatest variance on this variable. While the same directional difference holds for females, the differences are not nearly as great.

TABLE I

MEANS, STANDARD DEVIATIONS, AND ANALYSIS OF VARIANCE OF PERCEIVED CHOICE

	Choice			
	Male-I	Male-E	Female-I	Female-E
Mean	63.50	44.70	60.10	58.90
S.D.	13.28	17.68	13.49	12.30

	No Choice			
	Male-I	Male-E	Female-I	Female-E
Mean	47.20	26.90	36.60	33.40
S.D.	23.87	18.90	21.19	22.89

Source	Sum of Squares	df	Mean Squares	F	P
Choice	8632.0	1	8632.0	25.36	<.01
Sex	56.1	1	56.1	0.16	NS
I-E	2365.3	1	2365.3	6.95	<.01
Choice x Sex	277.5	1	277.5	0.81	NS
Choice x I-E	15.3	1	15.3	0.04	NS
Sex x I-E	1505.1	1	1505.1	4.42	<.05
C x S x I-E	0.3	1	0.3	0.01	NS
error	24501.7	72	340.3		
total	37353.4	79			

TABLE II

MEANS, STANDARD DEVIATIONS, AND ANALYSIS OF VARIANCE OF INTEREST

Choice				
	Male-I	Male-E	Female-I	Female-E
Mean	41.30	35.40	41.00	43.90
S.D.	11.31	15.67	8.26	15.35

No Choice				
	Male-I	Male-E	Female-I	Female-E
Mean	38.60	38.90	43.60	40.80
S.D.	8.08	16.56	15.15	9.54

Source	Sum of Squares	df	Mean Squares	F	P
Choice	.1	1	.1	.01	NS
Sex	285.0	1	285.0	1.70	NS
I-E	37.8	1	37.8	.23	NS
Choice x Sex	2.1	1	2.1	.01	NS
Choice x I-E	.3	1	.3	.01	NS
Sex x I-E	40.6	1	40.6	.24	NS
C x S x I-E	177.0	1	177.0	1.06	NS
error	12038.7	72	167.2		
total	12581.7	79			

TABLE III

MEANS, STANDARD DEVIATIONS, AND ANALYSIS OF VARIANCE OF SATISFACTION

	Choice			
	Male-I	Male-E	Female-I	Female-E
Mean	45.60	47.50	44.60	49.00
S.D.	8.95	12.86	8.64	10.01

	No Choice			
	Male-I	Male-E	Female-I	Female-E
Mean	42.30	42.70	50.20	47.50
S.D.	13.06	8.76	12.04	9.24

Source	Sum of Squares	df	Mean Squares	F	P
Choice	20.0	1	20.0	.18	NS
Sex	217.8	1	217.8	1.94	NS
I-E	20.0	1	20.0	.18	NS
Choice x Sex	186.1	1	186.1	1.66	NS
Choice x I-E	92.4	1	92.4	.82	NS
Sex x I-E	.4	1	.4	.01	NS
C x S x I-E	39.2	1	39.2	.35	NS
error	8083.6	72	112.3		
total	8659.6	79			

TABLE IV

MEANS, STANDARD DEVIATIONS, AND ANALYSIS OF VARIANCE OF TOTAL RECALL

Choice				
	Male-I	Male-E	Female-I	Female-E
Mean	13.90	13.10	14.90	15.90
S.D	6.17	6.28	5.55	4.40

No Choice				
	Male-I	Male-E	Female-I	Female-E
Mean	12.80	10.30	14.30	13.30
S.D.	7.83	5.36	7.52	6.36

Source	Sum of Squares	df	Mean Squares	F	P
Choice	63.0	1	63.0	1.60	NS
Sex	86.1	1	86.1	2.18	NS
I-E	13.6	1	13.6	.34	NS
Choice x Sex	.6	1	.6	.01	NS
Choice x I-E	17.1	1	17.1	.43	NS
Sex x I-E	13.6	1	13.6	.32	NS
C x S x I-E	.2	1	.2	.01	NS
error	2839.5	72	39.4		
total	3033.7	79			

TABLE V

MEANS, STANDARD DEVIATIONS, AND ANALYSIS OF VARIANCE OF RECALL BY CONCRETENESS

	1		2	
	Male	Female	Male	Female
Mean	3.65	4.62	2.85	2.75
S.D.	2.34	2.93	2.15	1.79
	3		4	
	Male	Female	Male	Female
Mean	2.52	2.62	3.45	4.50
S.D.	2.06	2.03	2.32	2.73

Source	Sum of Squares	df	Mean Squares	F	P
Between subjects	799.00	79			
Sex	20.50	1	20.50	2.05	NS
error	778.50	78	9.98		
Within subjects	1071.75	240			
Concreteness	152.96	3	50.99	13.31	<.01
Sex x Concreteness	20.96	3	6.99	1.82	NS
error	897.83	234	3.83		

TABLE VI

MEANS, STANDARD DEVIATIONS, AND ANALYSIS OF VARIANCE OF RECALL BY SERIAL POSITION

	1		2	
	Male	Female	Male	Female
Mean	1.62	2.22	2.70	3.08
S.D.	1.59	1.93	1.83	1.76

	3		4	
	Male	Female	Male	Female
Mean	2.92	3.15	5.25	6.12
S.D.	2.14	2.30	2.90	2.89

Source	Sum of Squares	df	Mean Squares	F	P
Between subjects	771.98	79			
Sex	21.53	1	21.53	2.24	NS
error	750.45	78	9.62		
Within subjects	1413.75	240			
Serial Position	624.11	3	208.03	62.10	<.01
Sex x Serial Position	4.81	3	1.60	.48	NS
error	784.83	234	3.35		

Table II presents means, standard deviations, and three-way analysis of variance for degree of interest expressed in the task of copying the words. All mean scores on this scale are in the mid-range, in the neither interesting nor boring range. None of the main effects or interactions reached statistical significance. There was virtually no difference between the choice and no-choice conditions. Although females rated the task as being slightly more interesting than did the males, this difference is far from being statistically significant. The difference associated with the I-E dimension was negligible.

Means, standard deviations, and three-way analysis of variance of satisfaction-dissatisfaction are presented in Table III. The mean ratings of satisfaction-dissatisfaction fall within a narrow range, in the neither satisfied nor dissatisfied part of the scale. There are negligible differences associated with the choice, no-choice condition and the I-E dimension. Females tended to express greater satisfaction, but this difference is also far from being statistically significant. None of the interactions were of any consequence.

Recall Measures

Table IV shows means, standard deviations, and three-way analysis of variance of the INC recall scores. The mean number of words recalled ranged from 12.80 to 15.90, or approximately 8 per cent of the total number of words presented. From the analysis of variance it may be seen that none of the main effects or interaction effects reached statistical significance. While choice subjects and females recalled a greater number of words than did their counterparts, these differences were not statistically significant.

The INC data were also analyzed to determine if recall was a function of the variables concreteness and serial position. Although none of the effects from the analysis of variance total recall achieved significance, the sex variable showed the largest difference and was carried along in the subsequent analyses. Means, standard deviations, and the repeated measures analysis of variance for the variable abstractness-concreteness are presented in Table V. The concreteness effect reached statistical significance ($p < .01$). The most abstract and most concrete words were more frequently recalled than were the words from the middle of the range. The words which were of medium concreteness (sets 2 and 3) were recalled nearly equally well, as were the most

abstract (set 1) and most concrete (set 4) words.

Table VI presents the means, standard deviations, and analysis of variance for serial position. The serial position effect was statistically significant and the pattern of means indicates this is a recency effect. Recall was highest for the words nearest the end of the list.

CHAPTER IV

DISCUSSION

The theory of cognitive dissonance claims that when an individual maintains "nonfitting" cognitions, a state of discomfort is aroused, resulting in behavior changes, cognitive changes, or exposure to new information. In forced-compliance studies, the general finding has been that those who choose to engage in a dull and repetitious task with little justification subsequently evaluate the task more favorably than do those who were forced to engage in the activity. That is, dissonant subjects in this paradigm resort to cognitive changes. In the present study subjects were given the choice of continuing or ceasing the task of copying a long list of words which were presented singly. From dissonance theory it would be expected that choice subjects would evaluate the tasks more favorably than would the no-choice subjects. This basic expectation was revised somewhat by both experimental findings and casual observations that individuals scoring in the internal direction on the internal-external locus of control personality dimension frequently respond differently in experimental settings than do those scoring in the external direction. Internals seem

to find a greater element of interest in experimental tasks under almost all conditions. In this study, therefore, it was expected that while Externals were likely to engage in positive task reevaluation, Internals would evaluate the task equally favorably under both conditions. The data presented in Table II indicate that while no such reevaluation occurred in Externals, Internals did evaluate the task equally favorably under both choice and no-choice conditions. The basic hypothesis was, however, that an interaction effect would be obtained, so it cannot be said that Hypothesis I received experimental support. Not only was Hypothesis I not confirmed, but there was no overall difference between choice and no-choice conditions, a finding which is not consonant with other dissonance research. This failure cannot be attributed to a failure of the choice instruction, since from Table I it can be seen that these instructions were effective. Neither can it be argued that dissonant subjects felt greater satisfaction in their performance, since the data presented in Table III indicate no significant differences on this variable. From the data obtained it appears that if differential dissonance was aroused in this study, it was not differentially reduced via the mechanism of task reevaluation.

Pallak, Brock and Kiesler (1967) and Pallak and Kiesler (1968) are convinced that subjects may avoid dissonance in the forced-compliance paradigm. They state that dissonant subjects will evidence enhanced task performance rather than positive task reevaluation. Their data indicate that high dissonance subjects showed greater INC than did low dissonance subjects in an experimental situation where subjects copied paired associates. Their findings can be compared with those of the present study since both utilized an INC paradigm. In addition, the present study can be considered to be a partial replication of the Spjut and James (1968) study, which found that females and Internals showed greater incidental learning than did their respective counterparts. Hypotheses II and III present the predictions made in the present study. From Table IV it can be seen that these hypotheses were not supported. That is, there were no statistically significant differences in incidental learning as a function of sex, I-E, or choice. These results do not support the findings of others mentioned above. It would appear that despite the previous research, the effect of these variables on incidental learning has not been unequivocally resolved.

This apparent failure to obtain differences in response measures which are usually sensitive to dissonance reduction is somewhat puzzling since the present study definitely has a certain degree of face validity. A reexamination of dissonance theory statements relative to forced-compliance may help. A general statement regarding this paradigm is that subjects who choose to engage in a dull and repetitious task with little justification subsequently evaluate the task more favorably than do those who were forced to engage in the activity. There are three basic elements in the statement: choice, dullness, and justification. While the data indicate that a marked difference in freedom of choice was perceived in the present study, data relevant to the two additional elements are not so unequivocal.

All subjects participating in this experiment were contacted by phone and informed that they would either receive regular research credit for their participation in the experiment or extra credit if they had already earned the required amount of research credits. The personal contact, as well as the research credit arrangement, may have increased subjects' perceived justification for participation in the experiment. In addition, the introductory instructions stated that their handwriting would be analyzed.

Although it was not stated they would be informed of the analysis, several subjects later intimated they would like to receive such an analysis. That the instructions likely facilitated an alteration in perceived justification for participation may be inferred from the relatively large number of statements regarding curiosity and interest in the experiment, 24 in all, given by those subjects who did not leave when given that choice. The prospect of having their handwriting analyzed may have served as a potential justification for participation in the experiment. Although it seems reasonable to assume that a uniformly low level of perceived justification would be essential in a forced-compliance paradigm, Brock (1969) presented evidence which appears to argue against this assumption. He varied both degree of volition and justification in an effort to determine the relative efficacy of these two elements in arousing dissonance. In the high-justification condition, subjects received eight relevant reasons, in the medium-justification condition they received three relevant reasons, and in the low-justification condition they were given eight factual statements regarding lung cancer. The relevant reasons generally appealed to the subject's dedication to science, the psychology department, the researcher, etc. Although

there were nearly no differences in enjoyment scores across the three levels of justification for subjects in the high or medium-volition conditions, degree of enjoyment decreased with increased justification for subjects in the low-volition condition. The difference between the high and medium trends, and the low-volition trend approached marginal reliability ($p. < .12$). The groups which appear to be of particular relevance to the present study are those in the high-justification condition, where the largest differences in enjoyment were found between low-volition subjects and high and medium-volition subjects. It is felt that the present study was essentially a high-justification condition because of the previously discussed factors of personal contact, promise of research credit or extra credit, and the interest and curiosity aroused by the prospect of having handwiting analyzed. From the above it would have been expected that differences would have been obtained between the choice condition and the no-choice condition. Why no such differences were obtained may be explicable in terms of the third essential element of the forced-compliance paradigm; i.e., dullness of the task. First of all, it is remarkable that not one subject found the sample portion of the task dull enough to choose to leave when the

opportunity was given, even though they clearly believed they had this option. In addition, the means presented in Table II indicate that none of the groups considered the task of copying the words to be extremely boring. Actually, all groups averaged in the neither interesting nor boring range of the attitude scale, as compared with the overall mean of enjoyment scores in the Brock study which was only somewhat greater than enjoyment to a very slight extent. In retrospect, it appears that, in addition to possible dissonance reduction via curiosity arousal, too much emphasis was placed on the "scientific" aspect of handwiring analysis, with the result that the tedious aspect of the copying task was too successfully masked. In other words, this task may not have fulfilled the paradigm's theoretical requirement that the task be aversive. While a low level of justification may not be essential in a forced-compliance paradigm, it appears that for differential dissonance to be aroused the task utilized should be uniformly evaluated as dull and boring. Since the task used in this study was not considered so aversive by those who participated, it is not so surprising that measures which are considered sensitive to differential dissonance reflected no such differences.

Before moving on to further considerations of the recall data it should be pointed out from Table I that for both choice and no-choice conditions, and for all groups, male Internals perceived the greatest freedom of choice and male Externals perceived the lowest freedom of choice. Although the same directional difference holds for females, the difference is not nearly as great. This finding suggests that the I-E scale is successful in measuring a broad continuum of a personality construct for males, but may not be as successful for females.

Previous research (e.g., Dukes and Bastion, 1966) has indicated that free recall of words is a linear function of concreteness, with concrete words being recalled better than abstract words. Free recall as a function of concreteness has not been explored using an INC paradigm. Although extrapolation from INT studies would predict that recall of words in an INC paradigm should also show a linear relationship to concreteness, the pilot data collected for the present study indicated a curvilinear relationship. Accordingly, Hypothesis IV predicted a curvilinear relationship with the expectation that the most abstract and the most concrete words would be recalled better than words of intermediate concreteness. From Table V it can be seen that

such a curvilinear relationship was replicated. Perhaps in a university setting where abstract reasoning ability is prized this finding is not surprising.

A strong recency effect generally occurs in free recall. The INC task in the present study is essentially a one-trial free recall task in which the presentation of words takes 15 minutes. Therefore, it was not surprising, as anticipated in Hypothesis V, that the most recently copied words were the most likely to be recalled.

APPENDICES

APPENDIX A

Words List

Level 1

attitude
anger
anxiety
blessing
chance
democracy
devotion
disposition
fate
freedom
glory
hatred
honor
hope
idea
impulse
ignorance
intellect
jealousy
joy
knowledge
love
loyalty
malice
method
mood
necessity
nonsense
obedience
opinion
panic
passion
pride
quality
recognition
sensation
sentiment
shame
soul
tendency
theory
thought
truth
vanity
virtue

Level 2

agony
amount
array
comedy
conquest
cost
crime
direction
drama
dream
event
evidence
excuse
fact
formation
fortune
goddess
health
hearing
hint
history
incident
joke
law
legislation
length
lord
majority
marriage
menace
month
occasion
patent
position
poverty
prayer
quantity
reflection
reminder
research
session
shock
style
tribute
warmth

Level 3

air
angle
baron
bloom
breeze
charter
chief
circle
colony
convention
dawn
decoration
dell
disease
examination
exhaust
gift
queen
headquarters
hide
industry
injury
institute
item
leader
link
master
odor
oxygen
party
plain
product
property
salary
salute
settlement
square
tempest
twilight
university
vapor
volume
victim
winter
world

Level 4

alcohol
ankle
apple
baby
book
bullet
cane
cigar
craille
diamond
door
elbow
engine
flag
flash
fork
grass
geese
harp
hoof
house
ink
inn
kettle
lake
library
letter
moss
mountain
mule
nail
pole
pepper
plank
rock
slinger
string
table
toast
tree
umbrella
vessel
water
wheat
wine

APPENDIX B

Raw Data

		Attitudes			Concreteness				Position				
CMI	Subject	1	2	3	1	2	3	4	1	2	3	4	Recall
	01	68	28	52	3	2	3	1	1	4	2	2	9
	02	73	48	77	9	4	7	4	6	3	7	8	24
	03	37	47	38	4	4	2	5	2	1	6	6	15
	04	73	32	51	6	1	1	2	1	3	2	4	10
	05	73	34	37	4	5	2	4	1	2	2	10	15
	06	58	45	36	7	5	2	9	1	9	5	8	24
	07	43	48	45	4	2	2	2	1	2	2	5	10
	08	67	65	61	4	1	8	3	3	3	4	6	16
	09	73	33	43	2	2	1	1	1	2	1	2	6
	10	70	33	56	4	3	0	3	1	1	2	6	10
CME	11	45	18	36	9	2	7	9	4	3	10	10	27
	12	38	48	52	2	2	3	0	0	1	2	4	7
	13	68	49	20	4	4	2	3	3	1	2	7	13
	14	6	22	51	4	2	0	3	3	2	1	3	9
	15	40	35	42	4	1	1	3	1	2	2	4	9
	16	38	47	52	4	6	3	5	1	3	5	9	18
	17	46	29	59	2	1	1	3	0	2	1	4	7
	18	69	33	53	6	3	5	4	1	5	6	6	18
	19	44	61	44	3	1	2	6	1	4	2	5	12
	20	53	12	66	2	3	2	4	3	2	3	3	11

Abbreviations:
- CMI - Choice-Males-Internals
- CME - Choice-Males-Externals
- CFI - Choice-Females-Internals
- CFE - Choice-Females-Externals
- NCMI - No Choice-Males-Internals
- NCME - No Choice-Males-Externals
- NCFI - No Choice-Females-Internals
- NCFE - No Choice-Females-Externals

		Attitudes			Concreteness				Position				
CFI	Subject	1	2	3	1	2	3	4	1	2	3	4	Recall
	21	69	48	37	2	0	7	3	3	3	3	3	12
	22	67	35	59	0	3	2	10	1	5	2	7	15
	23	31	47	50	11	4	1	3	1	6	6	6	19
	24	68	45	44	7	2	4	3	3	3	6	4	16
	25	55	47	37	4	2	1	2	1	3	1	4	9
	26	73	33	53	8	4	4	7	3	6	6	8	23
	27	57	47	54	3	4	4	6	3	4	7	4	18
	28	44	25	38	10	4	3	3	0	6	8	7	21
	29	68	35	36	1	2	1	6	2	3	2	3	10
	30	69	48	38	4	0	0	2	1	1	0	4	6
CFE	31	52	21	52	3	2	1	4	0	1	1	8	10
	32	71	48	36	7	3	2	13	4	5	6	10	25
	33	73	19	56	1	5	3	5	1	2	2	9	14
	34	69	60	52	8	3	3	3	4	3	2	8	17
	35	44	47	52	9	1	5	4	1	3	5	10	19
	36	68	49	53	6	1	6	4	3	5	3	6	17
	37	44	34	37	5	2	1	9	4	2	4	7	17
	38	69	48	65	5	0	0	6	0	3	4	4	11
	39	55	49	34	5	3	3	6	0	3	1	10	17
	40	44	54	53	4	4	1	3	0	3	2	6	12

NCMI	Subject	Attitudes 1	2	3	Concreteness 1	2	3	4	Position 1	2	3	4	Recall
	41	63	26	37	5	5	7	5	4	4	2	12	22
	42	69	42	37	3	4	2	3	1	1	3	7	12
	43	43	34	36	0	1	2	8	1	3	3	4	11
	44	6	48	21	1	2	2	2	0	2	0	5	7
	45	42	41	44	3	4	2	4	3	2	3	5	13
	46	50	32	52	4	4	2	1	2	5	1	3	11
	47	67	49	51	0	3	4	5	2	4	2	4	12
	48	7	33	65	0	1	1	1	0	1	1	1	3
	49	51	48	52	8	12	6	4	5	6	8	11	30
	50	72	33	28	5	1	0	1	0	2	3	2	7
NCME	51	27	48	52	3	2	2	0	1	1	4	1	7
	52	32	60	55	3	3	2	5	0	5	1	7	13
	53	6	48	34	7	7	1	8	6	2	4	11	23
	54	61	31	38	5	1	2	0	1	0	4	3	8
	55	52	34	36	4	1	1	1	0	4	1	2	7
	56	36	21	52	5	1	5	4	1	5	3	6	15
	57	6	48	52	1	1	3	4	1	4	2	2	9
	58	20	47	37	2	2	1	3	1	2	0	5	8
	59	21	48	36	0	2	2	4	1	0	2	5	8
	60	8	4	35	1	3	0	1	0	0	3	2	5

		Attitudes			Concreteness				Position				
NCFI	Subject	1	2	3	1	2	3	4	1	2	3	4	Recall
	61	61	48	49	0	1	2	1	1	1	1	1	4
	62	36	48	52	10	5	3	4	5	4	3	10	22
	63	38	21	52	1	2	1	4	0	3	1	4	8
	64	52	21	53	1	1	1	2	2	1	0	2	5
	65	38	53	64	6	2	0	5	2	1	4	6	13
	66	12	48	45	8	5	1	1	3	4	3	5	15
	67	8	52	46	4	2	0	4	2	1	3	4	10
	68	70	68	66	5	4	4	8	7	8	4	2	21
	69	11	29	53	5	8	7	6	7	6	3	10	26
	70	40	48	22	4	4	7	4	3	1	7	8	19
NCFE	71	63	29	46	9	3	2	1	1	4	8	2	15
	72	37	48	38	3	3	2	7	2	2	2	9	15
	73	12	44	43	2	5	2	6	1	1	2	4	15
	74	6	48	51	2	1	2	0	0	1	0	4	5
	75	46	26	37	2	2	4	2	0	2	3	5	10
	76	38	27	48	3	2	1	4	3	4	0	3	10
	77	14	42	37	4	4	5	3	5	2	3	6	16
	78	68	48	52	4	1	4	3	1	2	2	7	12
	79	6	48	64	7	6	6	9	6	3	6	13	28
	80	44	48	59	2	0	1	4	0	2	0	5	7

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