OPEN AND CLOSED BELIEF SYSTEMS AS CORRELATES OF THE ACCEPTANCE OF NEW MUSIC AND ITS COMPOSERS

by

BERNARD MIKOL

AN ABSTRACT

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ABSTRACT

Three interrelated experiments were undertaken within the conceptual framework of Rokeach on open and closed belief systems. The purpose of Experiment I was to investigate the relationship between open and closed belief systems and response to new music. From the theoretical model it was hypothesized that those with closed belief systems would be less accepting of new music than those with open belief systems. It was further hypothesized that those with closed belief systems would be less accepting of the composer than those with open belief systems.

One hundred and thirty-three sophomore students who had taken the Dogmatism Scale, the measure of open and closed belief systems, were exposed to two unfamiliar samples of music, one conventional as exemplified by Brahms, and the other extremely modern as exemplified by Schonberg. The results support the hypotheses that those with closed belief systems are less accepting of the new music and of the composer than those with open belief systems. No significant differences were found between these groups in age, intelligence as measured by the ACE, acceptance of conventional music, or knowledge about music as measured by a composer-composition matching test.

Experiment II was designed to re-test the previous hypotheses and to test two additional ones: given successive exposures to new music, those with relatively open belief systems would show a significantly larger gain in acceptance of the new music than those with closed belief systems. A parallel hypothesis was made concerning composer acceptance.

Brahms and Saint-Saens were used as samples of conventional music and Schonberg and Bartok as samples of new music. The results supported the hypotheses as they relate to Schonberg and his music but not to Bartok or his music. Schonberg's music was interpreted as being more extremely new than Bartok's music.

In Experiment III, the relationship between affect and cognition was explored. A cognitive task requiring both the overcoming and the integration of sets was used, and hypotheses were formulated that individuals most negative in their feelings about a new musical system would be slower in solving the problem and would find greater difficulty in integrating the sets into a new belief system than individuals extremely positive in their feelings about new music.

On the basis of their responses to a musical situation modeled after Experiment II, two groups of subjects were chosen to perform individually in the cognitive task. The groups were matched on acceptance of conventional music but as different as possible in the acceptance of new music. Though no significant differences were found, they were in the direction predicted by the hypotheses, suggesting that a low order relationship may exist between acceptance of new music and performance in a cognitive task.

Failure to confirm the hypotheses was explained in terms of the differences in the nature of the two tasks, i.e., reacting to music vs. solving a problem, and in terms of statistical considerations given the results of the previous study. An alternative hypothesis positing a parallelism between the range of affect and the range of

cognitive functioning was suggested. Affective narrowing is hypothesized to co-occur with cognitive narrowing and conversely, affective openness to co-occur with cognitive openness.

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CHAPTER I

INTRODUCTION

Purpose of the Study

The present investigation is concerned with the relationship between closed and open belief systems and the acceptance of new music and its composers. Considerations leading to hypotheses concerning the nature of these relationships stem from the theoretical model of Rokeach (19, 21, 22). The set of experiments presented here is part of a larger body of ongoing research which is cast within this framework.

The Concept of the Belief-Disbelief System

The model of cognitive organization developed by Rokeach is a three dimensional one consisting of belief-disbelief, central-peripheral, and time perspective dimensions. Each of these dimensions has additional properties. All are, however, reducible to one single dimension, namely, organization along a continuum from open to closed. In the following account, the belief-disbelief and central-peripheral dimensions alone bear on the present research and will be discussed. For a fuller account, the reader is referred to Rokeach (19, 21, 22).

The Belief-Disbelief Dimension

The basic construct of the conceptual model is the belief-disbelief system. The belief system is conceived to represent or

contain all the beliefs, sets, expectancies or hypotheses, conscious or unconscious, which a person at a given time accepts as true of the world he lives in. The counterpart of a belief system is not one single disbelief system but several disbelief sub-systems representing multiple disbeliefs rather than one single disbelief. Within each of these sub-systems is represented all the disbeliefs, sets, expectancies or hypotheses, conscious or unconscious which a person at any given time rejects as false to one degree or another. For example, a person who believes that the Classic period in history produced the greatest music, may in varying degrees believe that Romantic, Impressionistic, Neo-Classic and Jazz music are less great. In the limiting case, he might believe that only the music of the Classic period is worthwhile, the music of other periods to be rejected as unworthy to one degree or another.

The belief-disbelief dimension is conceived to have several additional properties in terms of which it may vary. Important in the present context is the property of isolation. This refers to the degree of communication or interconnectedness existing between and within the belief and disbelief system. One manifestation of isolation is the accentuation of differences and minimization of similarities between belief-disbelief systems. For example, some may insist that Jazz and Classical music have nothing in common or that oriental and occidental music are completely different. As pointed out by Rokeach (19), at one level, such accentuation of differences may be viewed as attempts to ward off threat to the validity of one's own system. From a structural standpoint, they

may be viewed in terms of an underlying isolation between belief and disbelief systems.

The belief-disbelief system is conceived to include the entirety of all beliefs about the physical world, ideological beliefs, and pre-ideological beliefs (i.e., highly personalized beliefs about the physical world, nature of self, etc.). The disbelief system is assumed to be arranged on a continuum of similarity with the belief system. In operational terms, this would mean that, were an individual to change from one belief system to another, he would be expected to change to a belief system which is more similar rather than less similar to his belief system. Parallel to and isomorphic with the belief-disbelief system is conceived to be a series of positive and negative authorities. As an example, an individual who believes strongly that only Beethoven wrote great music would see Schonberg, Stravinsky, Ravel, and Bartok as negative musical authorities.

The Central-Peripheral Dimension

The belief-disbelief system is conceived as organized along a central-peripheral dimension. The central region has to do with beliefs, the specific content of which pertains to the nature of physical reality and the nature of the social world--benign or hostile, i.e., whether parental authority figures are kindly or threatening.

The intermediate region has to do with the beliefs concerning the nature of authority. The interest here is in the formal, rather

than the specific, content of a belief. Important here are the formal similarities in thought and belief among persons adhering to different ideologies, i.e., the manner of believing rather than the content of the belief. By analogy, what arithmetic is to specific content, algebra is to formal content. Thus two persons may agree that there is such a thing as absolute authority, one true cause, one true Bible, only one kind of art. They may differ sharply as to who is the absolute authority, what is the true cause, the true Bible and the one kind of art. The style of believing is the same for both individuals, though the content of their beliefs may be quite opposed.

Beliefs about authority often color beliefs and feelings about people in general. People are sometimes evaluated according to the authorities they follow, so that the accepting and rejecting of people is tied to the accepting or rejecting of their ideas. This tie manifests itself in (1) opinionated rejection - which refers to the use of phrases which imply rejection of a belief and at the same time, rejection of persons who accept it. "You'd have to be stupid to believe that . . ." (2) Opinionated acceptance - which refers to the acceptance of a belief and at the same time a qualified acceptance of those who agree with it. "Any well-informed person knows that . . ."

The peripheral region represents beliefs and disbeliefs which derive from positive and negative authority, with or without awareness on the part of the individual believer.

It may be said that it is the nature of the content of the central region of beliefs which leads to more generalized styles or forms of belief about authority (intermediate region) and the beliefs which derive from authority (peripheral region). As Rokeach (22) points out:

> What is of major concern here is not so much the ideological content but rather the structural interconnections among peripheral beliefs and in turn, then the structural interconnections with those beliefs which have been represented as being within the intermediate and central region.

As stated at the outset, the entire model is reducible to one dimension, i.e., from open to closed. We quote below Rokeach's (23) definition of open and closed belief systems including only those aspects which are pertinent to the present research.

A belief-disbelief system is

OPEN	CLOSED
to the extent that, with respect to the organization along the disbelief continuum,	
there is communication of parts within and between the belief and disbelief system.	there is isolation of parts within and between the belief-disbelief system.
to the extent that, with respect to the organization along the central-peripheral dimension,	
the formal content of beliefs about authority and about people who hold to systems of authority is to the effect that authority is not absolute and that people are not to be evaluated (if they are to be evaluated at all) according to their agreement or disagreement with such authority or according to their agreement or disagreement with the beliefs such authority represents.	the formal content of beliefs about authority and about people who hold to systems of authority is to the effect that authority is absolute and that people are to be accepted or rejected according to their agreement or disagreement with the beliefs such authority represents.

Review of the Literature: Closed-to-Open Belief System

The Closed-to-Open dimension of the theoretical model has been reliably measured by the Dogmatism Scale (22) and empirically validated in several researches (23, 27). Typically the experimental strategy has been to invent, within the context of a problem, a fictitious world in which the laws are at variance with those of the every day world. The subject is required to break away from his present belief system and acquire a new belief system if he is to solve the problem. If his present belief-disbelief system is relatively closed, he would be expected to be slower in acquiring the new belief system.

That the Dogmatism Scale is a measure primarily of difficulty in acquiring systems of beliefs rather than individual beliefs has been shown in a study by Rokeach, McGovney and Denny (23). In a problem situation involving the overcoming of three separate sets or beliefs and the integration of these sets or beliefs into a new belief system, persons high in rigidity, as measured by the Sanford-Gough Rigidity Scale were found to be slower in overcoming each of the individual sets than persons low in rigidity. There was, however, no difference between individuals with relatively closed and relatively open belief systems, as measured by the Rokeach Dogmatism Scale, on the time taken to overcome the individual sets. By contrast, subjects scoring high on the Dogmatism Scale were found to be significantly slower than those with low scores in Dogmatism in integrating the three new sets once

they had overcome the three older sets. No differences were found between the high and low rigid groups with respect to the integration process. On the basis of these findings, the authors conclude that the greater difficulty shown by the subjects high in Dogmatism in integrating the new beliefs into a new system is a function of the stronger operation of systems of older beliefs which are organized into a relatively closed matrix. One of the theoretical implications drawn from these findings is that, while rigidity as a form of resistance to change, refers to the way a person solves or learns specific tasks, resistance to change as measured by the Dogmatism Scale refers to total cognitive organizations and systems of ideas and beliefs.

Vidulich (27) hypothesized that the greater difficulty in integration shown by subjects high in Dogmatism is a function of two factors: (a) greater rejection of the problem situation, and, consequently (b) poorer memory for the individual beliefs which must be integrated or brought into relevance to each other to solve the problem. Using the Dogmatism Scale and the same problem situation used by Rokeach, McGovney and Denny (23) the results indicate that those low in dogmatism accepted the problem and the beliefs significantly more than those high in dogmatism. Individuals low in dogmatism manifest at the end of the experiment a better incidental recall for the new beliefs than do individuals high in dogmatism.

The Problem

Theoretical Considerations Concerning the Use of Music

One of the basic assumptions guiding the formulation and conceptualization of the open-to-closed belief-disbelief system is the implied unity of style of believing, i.e., whether in a relatively open or closed manner, with a diversity of contents of belief. The belief-disbelief system is conceived as a form of belief organization which manifests itself regardless of the specific content of an ideology, whether religious, political or aesthetic. Thus, for example, the closedness aspect of two such diverse ideological contents as Catholicism and Communism were measurable with the same scale (21). It would appear that the greater the diversity among ideological contents, beliefs concerning which can be measured along the open-to-closed dimension by the same measuring scale, the more must the scale be tapping the style of believing rather than the specific content of a belief. Thus, music as different in content from any previously investigated within the present framework, allows a test of the basic assumption concerning the generality of the phenomena to which the notion of the closed or open belief system applies. Another way to state the basic assumption is that individuals with closed belief systems are assumed to render diverse belief contents as equivalent to the extent that the prerequisite for the acceptance of such beliefs is the shaking loose of previous patterns of belief.

Music affords an opportunity to expose subjects found to differ on the open-to-closed dimension of belief to a world of sound in which the laws governing its organization differ radically from those in the everyday world of music. The music of Arnold Schonberg written in the 'twelve tone technique'[1] seems particularly well-suited since the principles governing its construction differ radically from those involved in conventional music. For example, Schonberg's music is atonal, that is, written so that a key center[2] is avoided, while conventional music, as exemplified by the music of the nineteenth century has a definite key center and is therefore tonal. In Schonberg's music, the melodies are based upon the twelve tone row constructed according to certain rules[3] while conventional melodies are based on major and minor scales. Schonberg's harmonies are based on the tone row, i.e., the tones of the row used not only in succession but simultaneously as well. In conventional music, the harmonies are based on the triad, i.e., chords built by

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[1]The twelve tone technique involves, among other things, the use of the twelve tones of the scale in a pre-determined succession called a 'row'.

[2]Key center refers to that tone which serves as a focus for the organization of a piece or a section. In twelve tone music, there are assumed to be twelve such foci of equal importance rather than a single one.

[3]An example of such a rule would be that the composer decides in advance in which order he will use the twelve tones. Should he decide, for his own aesthetic reasons that the order will be e.g., C, E flat, E, G#, B, D, C#, F#, F, G, A, B flat, this sequence of tones, called a tone row, is maintained either in its original form or is varied according to still other rules (e.g., played backward or inverted).

superimposing tones a fixed distance from each other, viz. the second tone adjacent on the staff.

The music of Bartok, though less rigorously systematized than some of Schonberg's music, differs in many respects from conventional music by virtue of the use of polytonality, i.e., the simultaneous use of two key centers as contrasted with the single key center of conventional music. Bartok's melodies are extremely angular (movement by leap) while conventional melodies are more linear (movement by step). Bartok's music is characterized by the frequent use of dissonance and rhythmic complexity, while the conventional music is relatively consonant and rhythmically less complex.

Because of its diversity as content from previously investigated contents of belief within the present framework, thereby allowing a test of the generality of the closed belief-disbelief system, and because it allows exposure of subjects to a new system of reality, music is chosen as the experimental medium with which to study the problem of this research, namely, the relationship between open and closed belief systems and acceptance of a new musical belief system on the one hand and acceptance of its innovator on the other hand. Having chosen music as the experimental medium, a review of the pertinent literature on the relationship between belief and music is in order before a definitive statement of the problem can be made.

Review of the Literature: Music and Belief

The literature here is extremely sparse. It appears that most experimenters in the area of music have dealt with the properties of the music itself rather than with individual differences in response to the music and the determinants or correlates of these differences. Thus, for example, the affective characteristics of the major and minor mode (10), the mood characteristics of speed (14), and of register and tonality (15) have been studied as have the pleasantness of musical intervals (26), and music as communication (18). Of the studies which have focused on individual differences in background, music preferences as a function of age and socio-economic groups in unstructured situations (6), and of age, intelligence and training in relation to classic and modern music (24) have been investigated.

Of the personality-centered studies, reaction to music as a function of personal insecurity (7), personality and behavior disorders (2), masculinity-femininity (5), and mood (25) have been investigated. Since none of the above treats the relationship between belief and musical preference, they would appear to only peripherally relevant to the present investigation.

Only one experiment could be found which deals with the relationship between belief and music preference. Rigg (16) found that when Wagnerian music was given an association with Hitler and German nationalism, it was preferred significantly less than when given either romantic or no associations. This experiment contrasts

with the present research in two important ways: (1) Rigg dealt with a single belief, i.e., that Wagnerian music is associated with Hitler and German nationalism, while the present research is concerned with the organization of a belief network along the open-to-closed dimension, and (2) the belief was induced by the experimenter in Rigg's study while the present research is focused upon the organization of beliefs which the subjects bring with them to the experimental situation.

Though few experimenters have addressed themselves to the relevance of belief to musical preference, writers in the area of aesthetics and art criticism have been concerned with the problem of the aesthetic relevance of belief. Aiken (1) writes:

> The sensory and imaginal content of a work of art does not establish its own unity as an aesthetic whole; nor does it fit together simply because they co-exist. What is required if the elements are to be composed into an aesthetic whole is the presence of an ordering system of beliefs and attitudes which make them mutually relevant to one another . . . beliefs thus have the effect of creating a sustaining, an aesthetic "world" in which an indefinite variety of elements may be held together without strain or confusion.

Meyer (12) states that individuals bring to music specifically musical experiences, associations and dispositions and important beliefs about the nature and significance of aesthetic experience in general and the expected experience in particular. Concert program notes aim to enhance belief thereby aiding appreciation by creating a willing attitude.

Williams (28) found experimentally that, given sufficient training, program notes aided significantly a groups' liking or enjoyment of a musical program. Riemann (13) asserts that "practice

and good will are required for the understanding of a great and complicated musical work of art."

The observations of these writers seems to parallel the findings in the work of Vidulich (27). The "ordering system of beliefs and attitudes which make sensory and imaginal content relevant to each other" of which Aiken (1) speaks in the aesthetic situation is akin to the integration of beliefs in the problem used by Vidulich. The difficulty in integration was found to be a function of greater rejection of the problem situation and poorer memory for the individual beliefs. The "willing attitude" of which Meyer (12) speaks and the "good will" of which Riemann(13) speaks are considered to be essential in the aesthetic experience of a work of art, apparently no less than in the solution of a problem.

Statement of the Problem

It is assumed that individuals bring with them to the listening situation a set of beliefs concerning the nature of music, expectations of how music should sound, beliefs about good and bad music and beliefs about what is and what is not music. For example, in 1913, at the premiere of Stravinsky's Rites of Spring, an actual riot resulted, so strongly polarized were the beliefs concerning whether or not this could even be considered to be music. Forty-five years later there is little doubt as to the extreme importance of this work in the history of music. Is there a basis for making predictions as to how beliefs will

polarize in such situations, i.e., who will be receptive and who rejecting of such innovation? This is the problem of the present research.

From considerations of the theoretical model and its several properties, predictions concerning the reactions of individuals to music which is at variance with expectations and beliefs can be made. The closed belief-disbelief system is characterized by the property of isolation manifested by an overemphasis of differences between the belief and the disbelief system. Applied to music, if there are individuals who have the same beliefs about conventional music, i.e., who are accepting of it to the same degree (the belief system), it would be expected that when exposed to music which is strange and unexpected and perhaps even somewhat unpleasant (the disbelief system) the individuals with closed belief systems would be more rejecting of the new music than those with relatively open belief systems. These expectations are in line with the findings of Rokeach, McGovney and Denny (23) and Vidulich (27).

From considerations concerning the central-peripheral dimensions of the model, i.e., the intermediate region, in which acceptance and rejection of people is tied to the acceptance and rejection of their beliefs, expectations are that the rejection of a composer's beliefs as exemplified in his music are tied to the rejection of him to the extent that the belief-disbelief system is closed.

Specific Hypotheses

From the above considerations, the following specific hypotheses are formulated for testing:

(1) Given two groups equally accepting of conventional music, individuals with relatively closed belief-disbelief systems will be less accepting of new music than individuals with relatively open belief-disbelief systems.

(2) Given two groups with equal acceptance of the composer of conventional music, individuals with relatively closed belief-disbelief systems will be less accepting of the composers of new music than individuals with relatively open belief-disbelief systems.

Overall Plan

The above hypotheses are tested in Experiment I, the first of the two experiments with music and open-closed belief systems described below. In Chapter II, the methodology common to both experiments is described. In Chapter III, the instructions, experimental sequence, and results of Experiment I are followed by the rationale, instructions, experimental sequence, and results of Experiment II. Chapter IV presents an experiment with music and problem solving. Chapter V is the summary and conclusions of

Experiments I, II, and III, with suggestions of an alternative hypothesis in future research.

CHAPTER II

METHOD

The Choice of Music

The choice of music was dictated by three considerations:

(1) The music selected should be equally unfamiliar to all subjects. Thus, previous experience would not be a contaminating variable requiring exclusion of the subject from the experiment. To help meet this requirement, chamber works, assumed to be less well known by the general listener, were chosen.

(2) Any conclusion that group differences in response to new music are mediated by open versus closed belief systems is warranted only if it can be shown that the groups do not differ in their response to conventional music of the same general type. Thus, a work constructed along the conventional lines of the Nineteenth Century was paired with an unconventional work of similar type written in the Twentieth Century.

(3) There should be no gross differences between the conventional and unconventional works in instrumentation or tempo. While pairs of works with the same instrumentation are easily located, tempo is less easily matched. We may state that whatever differences in tempo exist may be considered random error since conditions are the same for both groups.

With these considerations in mind, in Experiment I, the Brahms C Minor String Quartet, written in the Nineteenth Century,

was paired with the Schönberg Fourth Quartet, written in the Twentieth Century. The former is written within the conventional musical framework; the latter is in the unconventional twelve tone framework. In Experiment II, to the above are added the conventionally written Sonata for Piano and Violin in D Minor of Saint-Saens and the First Sonata for Piano and Violin of Bartok. The latter deviates from conventionality in several important aspects viz. use of polytonality, angularity of melodic line, and rhythmic complexity.

Measurement of Open-Closed Belief Systems

The Dogmatism Scale[1] consisting of 40 items, with 22 filler items was used to measure the degree to which belief systems are open or closed (Appendix A). For a discussion of the characteristics of this scale, the reader is referred to Rokeach who reports split-half reliabilities of .78 and .81 (21), while Vidulich (27) reports a split-half reliability of .78. On this basis, the scale was assumed to be sufficiently reliable for group research.

The Measurement of Acceptance of the Music and the Composer

In the two experiments to be reported here, two adjective checklists, one applicable to music and the other to composers, were

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[1] In Appendix A, the 22 filler items are numbered as follows: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 61, 62.

used. Each list consisted of 15 pairs of adjectives, one of each pair assumed to be valid for positive and the other for negative feelings, in the case of the first list about music and in the case of the other, about composers. That the assumption of validity was not wholly warranted is indicated by the fact that unanimous agreement among judges as to the sign of the adjective, whether positive or negative, could be obtained in each of the two sets for only 10 of the 15 adjective pairs. Judges were six graduate students in psychology. Consequently, only responses to these two sets of 10 pairs were scored in both Experiments I and II.

For the music, the adjectives were: beautiful, ugly; melodious, noisy; refined, vulgar; graceful, clumsy; creative, gibberish; interesting, dull; imaginative, simple minded; profound, senseless; attractive, superficial; stimulating, repulsive.

For the composers, the adjectives were: genius, crackpot; brilliant, dull; sensitive, insensitive; inspired, disorganized; alert, apathetic; profound, shallow; playful, muddle headed; democratic, autocratic; tolerant, intolerant; witty, fearful.

The score was the difference between the number of positive and the number of negative adjectives, with a constant of 10 added to eliminate negative scores. Thus, a subject for any given excerpt or for any given composer might score between zero (low acceptance) to 20 (high acceptance).

Estimate of Formal Musical Background and Training

To determine the relationship between training in serious music and receptivity to new music, an information sheet was filled out by each subject giving the extent of instrumental or vocal study, time spent listening to music, the number of concerts attended in the last eighteen months and preference for types of music (Appendix B).

Estimate of Subject's Acquaintance with Serious Music

To gain an estimate of knowledge about serious music and its composers, the subjects were asked to match 25 composers with 29 musical compositions in the standard concert repertoire. The score was the number of correct matchings (Appendix B).

Subjects and Procedure

Experiments I and II were anonymous group experiments. The 133 subjects of Experiment I and the 147 subjects of Experiment II were mainly sophomores enrolled in the introductory psychology courses at Michigan State University in the spring of 1956. They were American born white students with the exception of one Negro in Experiment I and two foreign born and two Negro students in Experiment II. All of the subjects had already filled out the Dogmatism Scale on a previous occasion without giving their names. They were later identified by matching date and place of birth.

The general procedure for Experiments I and II, though similar in many respects, differ in several important aspects to be pointed out later. In both experiments, the subjects, after giving information on their formal musical background, listened to musical excerpts presented by a tape recorder. They then expressed how they felt about the music and the composer by checking adjectives from a checklist. After the presentation of the excerpts, the subjects completed the composer-composition matching test. The exact sequence for each experiment and the instructions are given in Chapter III.

CHAPTER III

EXPERIMENTS WITH MUSIC AND OPEN-CLOSED BELIEF SYSTEMS

EXPERIMENT I

Instructions and Sequence

The experiment was carried out under classroom conditions in groups of 30-50 students. The following instructions were given orally:

> "This is a musical interest survey. We are sampling the musical likes and dislikes of college students and we would like to get your reactions to the music you are about to hear. It has been said that in matters of taste there is no dispute. This is certainly the rule here. We would like you to be perfectly free in expressing how you feel about the music.
>
> A word about procedure. You are about to hear two excerpts of music. After each excerpt, write the name of the composition and the composer. If you don't know, write 'don't know'. If you have heard either of these compositions before, please indicate by circling the appropriate number. Any questions?"

Two excerpts, each of two and one-half minutes in length, the one from the opening of the Brahms C Minor Quartet and the other from the opening of the Schonberg quartet were played via tape recorder. The subjects were then asked to identify if they could the composer and composition. Then, the following additional instructions were given:

> "You will now hear the same compositions again. This time I would like your reaction to the compositions, that is, the way you feel about them as music, whether you like or dislike them. Please be as frank as you can. Remember it is your personal opinion we want. Will you please check the adjectives which you feel apply to the first composition? Do not place a check if in your opinion the adjective doesn't apply."

Following the replaying of the Brahms, subjects were given about one minute to check the adjectives. They were then asked:

> "Please check those adjectives which express your opinion about the first composer."

The same sequence was repeated for the replaying of the Schonberg. Following the playing of the excerpts, subjects were allowed up to ten minutes to complete the composer-composition matching test.

Treatment of the Data

In treating the data, the subjects were divided into two groups, those high in dogmatism called the Closed-Belief Group and those low in dogmatism, the Open-Belief Group. Whether a subject was high or low was determined by whether he fell within the top and bottom 15 percent of the distribution of subjects participating in each experiment. In this way, 40 subjects in Experiment I, 20 in each group, and 44 subjects in Experiment II, 22 in each group were obtained. Not one of those subjects reported having heard the music before nor were any of them able to identify either the composer or the composition. It was not necessary to discard any data on this account since all subjects were matched with respect to familiarity. Tests of significance for the main hypotheses were carried out by the use of t-tests for small samples (9). For our directional hypotheses, a one-tailed test of significance was used.

Results

Table 1 summarizes the main results of this experiment. In view of our directional hypotheses, a one-tailed test of significance has been utilized. As can be seen, there are no significant differences between the Open and Closed-Belief Groups in response to either the conventional music or the composer of the conventional music. On the new music, however, the groups differ significantly in the predicted direction. The Closed-Belief Group is significantly less accepting of the new music ($p < .025$) and is less accepting of the composer ($p < .005$) than the Open Belief Group.

The results of the analysis of the musical background variables are presented in Table 2. Because of the large number of zero scores implying a skewed distribution, the Chi-Square test was used. To avoid small theoretical frequencies, only two categories were used. As can be seen, the two groups do not differ significantly on years of study, frequency of attending concerts, number of courses taken in or preference for, Classical music. There is, however, a nearly significant difference between the Closed Belief and the Open Belief Groups with more subjects of the Closed Belief Group spending one or more hours per week listening to Classical music than those within the Open Belief Group. The meaningfulness of this difference is open to question for the following reasons:

(1) The difference is not a stable one. In Experiment II, Table 9, with similar data and similar subjects, the difference disappears.

TABLE 1

RELATIVE ACCEPTANCE OF THE CLOSED-BELIEF (C-B) AND OPEN-BELIEF (O-B) GROUPS OF MUSIC AND THE COMPOSERS

Variable		Group[1]	N	Mean	S.D.	t[2]	P
Music	Brahms	C-B	20	14.85	3.44	.46	NS
		O-B	20	14.35	3.20		
	Schonberg	C-B	20	5.75	3.46	2.05	.025
		O-B	20	8.25	4.01		
Composer	Brahms	C-B	20	12.65	2.17	.14	NS
		O-B	20	12.75	2.12		
	Schonberg	C-B	20	7.45	2.62	2.86	.005
		O-B	20	9.80	2.48		

[1]The following abbreviations are used in subsequent tables: C-B for Closed-Belief, and O-B for Open-Belief.

[2]In view of the directional hypotheses, a one-tailed test of significance has been utilized.

TABLE 2

FORMAL MUSIC BACKGROUND OF THE TWO GROUPS

	Years of Study Classical Music		Hours per Week of Listening to Classical Music		Concerts Attended Past Two Years of Classical Music		Courses of Classical Music		Preference	
									Classical and Semi-Classical	Jazz and No Preference
	0	1>1*	0	1>1	0	1>1	0	1>1		
C-B	13	7	5	15	9	11	20	0	15	5
O-B	16	4	11	9	12	8	20	0	13	7
χ^2	.49		3.75		0.92		--		0.47	
p	NS		.06	.05	NS		NS		NS	

* >Signifies "more than"; < signifies "less than".

(2) If the Closed Belief Group does listen to classical music more than the Open Belief Group, it has no observable effect on their liking of conventional music. From Table I it can be seen that the group means for the Brahms are almost identical.

(3) Our obtained Chi-square of 3.75 falls short of the required value of 3.84 for significance at the .05 level.

In view of the above we believe it safe to interpret this as a chance difference.

The data for the composer-composition matching test, presented in Table 3, were found to be non-homogeneous with respect to variance. This suggests that the assumptions underlying the use of normal probability statistics are not being met. Consequently, a non-parametric test by White (4, pp. 417-22) was employed. This tests the Null hypothesis that the two sets of observations are from a common population, without making any assumptions concerning the distribution of measures in this population. As can be seen, the differences in knowledge about serious music as measured by this test is not significant.

In Table 4 are shown the data on age and intelligence as estimated from the American Council on Education Psychological Examination (ACE). As can be seen, neither of these differences is significant.

Summarizing, the differences between the two groups on acceptance of new music and acceptance of the composer are not accounted for by differences in the liking of conventional music,

TABLE 3

COMPOSER-COMPOSITION MATCHING TEST

Group	N	Mean*	Sigma	Z	p
C-B	20	3.00	2.74		
				.62	N. S.
O-B	20	4.70	5.09		

*Means and S.D.'s are presented for illustrative purposes only. Significance was tested by non-parametric procedures in view of non-homogeneous variance.

TABLE 4

AGE AND INTELLIGENCE OF THE CLOSED AND OPEN BELIEF SUBJECTS

	Age		ACE	
	Mean	Sigma	Mean	Sigma
C-B	21.70	2.41	5.37	1.60
O-B	22.30	2.92	5.89	1.76
t	.69		.75	
p	N.S.		N.S.	

by musical training and background, by knowledge about music, age, or intelligence as measured by the ACE. The fact that none of these variables seem to be related to the differential response to new music, lends additional weight to the results in substantiating our hypotheses relating open and closed-belief systems as measured by the Dogmatism Scale to new musical systems and acceptance of the composer as measured by reactions to Schonberg and his music.

EXPERIMENT II

Rationale and Hypotheses

The purpose of this experiment was to enlarge the scope of the previous one by increasing the number of musical samples, to retest the hypotheses of Experiment I, and to test two additional hypotheses. Added to the Brahms and Schonberg of the previous experiment are the Violin and Piano Sonata in D Minor by the Nineteenth Century composer Saint-Saens which was paired with the First Violin and Piano Sonata by the Twentieth Century composer Bartok.

The two additional hypotheses to be tested relate to the findings of Rokeach, McGovney, and Denny (23) and Vidulich (27). These investigators found that individuals with closed-belief systems were slower than those with open-belief systems in integrating sets into a new belief system. This finding suggested the following question: if two groups of individuals were presented with two successive samples of new music, would those with closed-belief systems change in receptivity at a slower rate than those with open-belief systems? Similarly, would acceptance of the composers of the new systems show the same differential rate of change? Theoretical considerations and previous research suggested an affirmative answer. Stated in the form of hypotheses:

(1) Given successive exposures to new music, those with open-belief systems will show a significantly larger gain in acceptance to the new music than those with closed-belief systems.

(2) Given successive exposures to new music, those with open-belief systems will show a significantly larger gain in acceptance of the composer than those with closed-belief systems.

Experimental Sequence

The experimental design, including instructions to subjects, is essentially the same as that of Experiment I with modifications in the length and number of excerpts. In Experiment I, it will be recalled, the subjects listened to the same two and a half minute excerpt twice prior to checking the adjectives. In Experiment II, each excerpt was two minutes in length and subjects' reactions were obtained after a single hearing.

The number of excerpts was increased from two to eight. Two excerpts, continuous 2-minute samples taken from the opening of each of four compositions were used. The subjects were informed of this procedure. The music, ascertained to be unfamiliar to all subjects by their unsuccessful attempts to identify either the music or the composer, was presented by tape recorder in the following sequence: Brahms (excerpts 1 and 2), Schonberg (excerpts 1 and 2), Saint-Saens (excerpts 1 and 2), and Bartok (excerpts 1 and 2). Following each excerpt two measures were obtained for a total of eight excerpts. All other details of this study, i.e., measures, scoring, and treatment of the data, are the same as in Experiment I.

Results

As can be seen from Table 5 the two groups do not differ on the Brahms' and Saint-Saens' compositions for either excerpt. It is noteworthy that the response of both groups to the initial 2-minute Schonberg sample is extremely similar. Only after the second exposure is there suggestion of a difference, the Open-Belief Group becoming more accepting, the Closed-Belief Group becoming less accepting of Schonberg's music. It will be recalled that in Experiment I, with 2-two and a half minute exposures as contrasted with 2-two minute exposures here, the differences for the Schonberg music were more definitive (Table 1). Apparently, the differences are sharpened as a function of exposure time. Even though the difference is not significant at the end of Schonberg Exposure 2, in the light of the results of Experiment I (Table 1) the difference and its direction appear to be stable. Edwards (4, pp. 391-3) describes a Chi-square test for the significance of a set of results which meet the assumption of independence, an assumption likely to be justified only when different samples of subjects are used in each experiment. The Chi-square test is based upon the fact that the natural logarithm (base e) of a probability p is equal to $-\frac{1}{2}$ Chi-square with 2 degrees of freedom, and that the sum of a number of independent values of Chi-square is also distributed as Chi-square with degrees of freedom equal to the sum of the degrees of freedom for the individual Chi-square values.

TABLE 5

ACCEPTANCE OF CLOSED-BELIEF (C-B) AND OPEN-BELIEF (O-B) GROUPS OF CONVENTIONAL AND NEW MUSIC

Composition	Group	N	Excerpt 1				Excerpt 2			
			Mean	S.D.	t	p	Mean	S.D.	t	p
Brahms Quartet	C-B	22	12.91	3.40	.26	N.S.	12.73	2.82	.37	N.S.
	O-B	22	13.14	2.47			13.04	3.14		
Schonberg Quartet	C-B	22	8.40	2.71	.15	N.S.	8.00	3.15	1.06	.15
	O-B	22	8.27	3.09			9.09	3.55		
Saint-Saens Sonata	C-B	22	14.95	2.53	.11	N.S.	15.00	2.84	.28	N.S.
	O-B	22	15.04	2.88			14.77	2.41		
Bartok Sonata	C-B	22	9.04	3.50	.74	N.S.	10.14	3.49	.68	N.S.
	O-B	22	9.82	3.34			10.91	3.75		

A one-tailed test has been used for those comparisons involving a directional hypothesis.

Pooling the probabilities from these two independent experiments, Experiment I, Table 1 ($p < .025$) and Experiment II, Excerpt 2, Table 5 ($p < .15$), the Chi-square value of 11.17 with 4 degrees of freedom is significant beyond the .03 level of confidence. The Closed-Belief Group is significantly less accepting of Schonberg's music than the Open-Belief Group.

From Table 5 it is seen that though the means for the Bartok are consistently in the hypothesized direction, an acceptable significance level is not attained. Thus, hypothesis 1, Experiment I, to the effect that those with closed belief systems will be less accepting of new music than those with open belief systems is not clearly confirmed when Bartok's music is regarded as an example of new music. When Schonberg's music is taken as an example, the results of Experiments I and II considered together clearly confirm hypothesis I.

From Table 6 it can be seen that, while there are no differences between the groups on the conventional composers, the tendency for the Closed-Belief Group to be less accepting of Schonberg becomes more pronounced after the second excerpt, at which point the difference approaches significance ($p < .075$). On the basis of significant findings in Experiment I on this variable, the difference may be considered a reliable, if not a significant, difference. Pooling the probabilities of both experiments (Experiment I, $p < .005$, Experiment II, $p < .075$), the Chi-square value of 15.78 with 4 degrees of freedom is significant beyond the .01 level

TABLE 6

ACCEPTANCE OF COMPOSERS BY THE C-B AND O-B GROUPS

Composer	Group	N	Excerpt 1				Excerpt 2			
			Mean	S.D.	t*	p	Mean	S.D.	t*	p
Brahms	C-B	22	11.36	2.10	1.02	N.S.	11.68	1.94	.22	N.S.
	O-B	22	11.95	1.66			11.82	2.04		
Schonberg	C-B	22	9.09	1.95	.28	N.S.	8.73	2.51	1.56	.075
	O-B	22	9.27	2.16			9.86	2.16		
Saint-Saens	C-B	22	12.86	1.49	.33	N.S.	12.82	1.40	.28	N.S.
	O-B	22	12.68	2.05			12.68	1.79		
Bartok	C-B	22	9.04	2.28	1.03	N.S.	9.82	2.59	.51	N.S.
	O-B	22	9.77	2.30			10.23	2.66		

*The one-tailed test has been used for comparisons involving a directional hypothesis.

of confidence. Considering the results of both experiments together, the Closed-Belief Group is significantly less accepting of the composer Schonberg than the Open-Belief Group.

For composer Bartok, the difference is not significant. Thus, hypothesis 2 which states that those with closed belief systems will be less accepting of the composers of new music than those with open belief systems is confirmed only for the composer Schonberg.

To test the hypotheses concerning change in receptivity following successive exposures to new music, the mean gains from excerpt 1 to excerpt 2 were analyzed. As expected, no significant changes were found on the conventional compositions (Table 7). On the Schonberg, however, it can be seen from Table 8 that the Closed-Belief Group decreases in receptivity to Schonberg from excerpt 1 to excerpt 2 while the Open-Belief Group increases. The difference between the changes from excerpt 1 to excerpt 2 is significant ($p < .05$). On the Bartok, contrary to expectations, both groups became more receptive after a second exposure to almost an identical but not significant degree. Thus, the hypothesis which states that given two exposures to new music, those with open-belief systems will show a significantly larger gain in receptivity to the new music than those with closed belief systems is again confirmed only for the Schonberg music.

Concerning change in composer acceptance, no significant differences were found either for the conventional composers

TABLE 7

RELATIVE CHANGES IN ACCEPTANCE OF CONVENTIONAL MUSIC AFTER TWO EXPOSURES

Composition	Group	N	Mean Gain	Sigma	t	p
Brahms Quartet	C-B	22	-.18	2.075	.015	N.S.
	O-B	22	-.090	1.93		
Saint-Saens Sonata	C-B	22	+.045	1.97	.54	N.S.
	O-B	22	-.27	1.86		

TABLE 8

RELATIVE CHANGE IN ACCEPTANCE OF NEW MUSIC
AFTER TWO EXPOSURES

Composition	Group	N	Mean Gain	Sigma	t	p
Schonberg Quartet	C-B	22	-.40	1.87	1.89	.05
	O-B	22	+.82	2.30		
Bartok Sonata	C-B	22	+1.10	2.29	.15	N.S.
	O-B	22	+1.09	2.04		

(Table 9) or for Bartok (Table 10). For Schonberg, however, (Table 10) the difference in gain in acceptance is significant ($p < .05$), the Closed-Belief Group becoming less accepting, the Open-Belief Group becoming more accepting of Schonberg.

Summarizing, the hypotheses are confirmed only to the extent that they bear on the reaction to Schonberg and his music. Neither for the conventional music or composer nor for the Bartok, were there any significant differences.

As in Experiment I, the several background variables seem to bear no relationship to the response to either the music or the composers, as seen in Table 11. No significant differences are found between the two groups on years of study, hours per week of listening, number of concerts attended in the past 18 months, number of courses in or preference for classical music.

The data for the composer-composition matching test (Table 10) were analyzed by a non-parametric test, White's T (4, pp. 417-22) in view of the non-homogeneity of the variance. The Open Belief Group knows significantly more about serious music and its composers ($p < .04$) than does the Closed Belief Group. In Experiment I the difference, though not significant, was in the same direction as that found here suggesting that this tends to be a stable trend even though it appears to have little differential effect on liking for conventional music. This advantage in knowledge seems, plausibly, a characteristic of greater openness to new ideas, and experiences of individuals with relatively open belief systems.

TABLE 9

RELATIVE CHANGE IN ACCEPTANCE OF THE CONVENTIONAL COMPOSERS AFTER TWO EXPOSURES TO MUSIC

Composer	Group	N	Mean Gain	Sigma	t	p
Brahms	C-B	22	+0.045	0.25	.13	N.S.
	O-B	22	0.00	1.17		
Saint-Saens	C-B	22	+ .32	1.66	.82	N.S.
	O-B	22	- .14	1.91		

TABLE 10

RELATIVE CHANGE IN ACCEPTANCE OF THE NEW COMPOSERS AFTER TWO EXPOSURES TO MUSIC

Composer	Group	N	Mean Gain	Sigma	t	p
Schonberg	C-B	22	-.36	1.69	1.97	.025
	O-B	22	+.59	1.43		
Bartok	C-B	22	+.78	2.47	.49	N.S.
	O-B	22	+.46	1.73		

TABLE 11

FORMAL MUSIC BACKGROUND OF THE TWO GROUPS

	Years of Study of Classical Music		Hours per Week of Listening		Concerts Attended Past Two Years		Courses of Classical Music		Preference	
	0	1>1	0	1>1	0	1>1	0	1>1	Classical and Semi-Classical	Jazz and No Preference
C-B	15	7	14	8	15	7	22	0	15	7
O-B	15	7	13	9	11	11	19	3	17	5
χ^2	0.00		0.15		1.50		--		0.46	
p	N.S.		N.S.		N.S.		N.S.		N.S.	

> means "more than"

TABLE 12

COMPOSER-COMPOSITION MATCHING TEST

Group	N	Mean*	Sigma	Z	p
C-B	22	2.50	1.50		
				2.08	.04
O-B	22	6.54	5.94		

*Means and S.D.'s are presented for illustrative purposes only. Significance was tested by non-parametric procedures in view of the non-homogeneous variance.

Table 13 presents the data on age and intelligence as measured by the ACE. Neither of these differences is significant, thus corroborating the findings of Experiment I. The p value of $<.20>.10$, however, favoring the Open-Belief Group in intelligence, and the significant difference in knowledge about music again favoring the Open-Belief Group raises some issues concerning the probable influence of these variables on music preference in addition to or independent of the effects of closed or open belief systems. The following points are clearly established by the two experiments:

(1) With or without significant differences in knowledge about music and with or without a slight "edge" on intelligence, there are no differential effects on preference for conventional music (Tables 1 and 5).

(2) Similarly, knowledge about music and a slight "edge" on intelligence has no differential effects on preference for Bartok (Table 5).

(3) In Experiment I, the findings with respect to Schonberg were more definitive (music $p<.025$, composer $p<.005$) in the absence of significant differences in knowledge and intelligence. In Experiment II, the findings with respect to Schonberg are less definitive (music $p<.15$, composer $p<.075$) in the presence of the differences in knowledge and the possibly slight "edge" on intelligence by the Open-Belief Group.

(4) The correlation between ACE and response to Schonberg for the group as a whole ($N = 124$ for whom ACE scores were available) is +.056 which is not significant.

TABLE 13

AGE AND ACE OF THE OPEN AND CLOSED BELIEF GROUPS

Group	N	Age		ACE	
		Mean	S.D.	Mean	S.D.
C-B	22	21.27	2.32	5.47*	1.68
O-B	22	21.73	2.42	6.39**	1.74
t		.62		1.55	
p		.28		.20	.10

* 17/22 available scores
** 18/22 available scores

On the basis of these findings, it appears that intelligence as measured by ACE and knowledge about music as measured by the composer matching test do not function in any consistent way to determine the response to music and hence their influence is likely to be negligible. Additional weight is given to this conclusion in regard to intelligence by the work of Rubin-Rabson (24) who investigated the effects of intelligence and other variables on reactions to classical and modern music. This investigator found a non-significant average positive correlation (r +.119) between liking modern music and intelligence, with a range of correlations from -.187 to +.726 in which liking for Schonberg's music (written in his early creative period) was negatively correlated with intelligence. Rubin-Rabson concluded that the influence of intelligence is slight.

DISCUSSION OF EXPERIMENTS I AND II

The results of both experiments lend support to the hypothesis that those with closed belief systems are less accepting of new music and the composers of new music as exemplified by Schonberg but not as exemplified by Bartok. Thus, some limits are placed on the degree to which generalization is appropriate in relating closed belief systems to reactions to all new musical systems and their composers. The differences between the Open Belief and Closed Belief Groups on the Schonberg are considerably less sharp after the second exposure in Experiment II (Table 5) than after the second exposure in Experiment I (Table 1). The difference in methodology would appear to account for some of this difference. It will be recalled that in Experiment I, the groups listened to the same two and one half minute excerpts twice prior to responding. In Experiment II, the groups listened to two different excerpts from the same composition responding after each one. Here each excerpt was only two minutes in length. Rigg (16) found that, in general, repetition increased liking for music. It is striking that this held for only the Open Belief Group; for the Closed Belief Group repetition had the opposite effect.

From Table 5 it can be seen that both groups reacted more positively to the Bartok than to the Schonberg music. An examination of the musical score for the Bartok suggests some possible reasons. Although both the Schonberg and the Bartok music, as specific compositions, were equally unfamiliar to all of the subjects, there may well

have been some familiar stylistic elements present in the Bartok which were not present in the Schonberg. Bartok uses tonal combinations reminiscent of the Nineteenth Century, i.e., conventional music albeit in new ways. These occurred in the music at a time when they would be likely to exert a strong influence on the response to the music, i.e., just prior to the end of the second excerpt. Bartok uses simultaneous major and minor thirds to introduce a new section in the music in measures 103-114 of the score. It should be pointed out that the third is one of the sounds most characteristic of the Nineteenth Century and hence conventional music. Even though most Nineteenth Century composers do not juxtapose major and minor thirds simultaneously, this use of thirds in Bartok's music may well have functioned as an element of familiarity and hence increased acceptance of the whole excerpt. Another likely aspect influencing general acceptance is the fact that the mood of the music changes from one of a stormy agitation to a quiet lyricism. That point in the music at which the subjects responded by checking adjectives may well have been experienced as a reduction in tension and hence pleasant. In general, it might be said that Bartok's music is less rigorously systematized than Schonberg's.

In Experiment II, the mean gain in receptivity to the Schonberg music by the Open Belief Group coincident with a mean loss by the Closed Belief Group lends empirical weight to the notion of resistance to change as an aspect of closed belief systems. Where

previous research established a relationship between closed belief systems and functioning integratively in a cognitive task (23, 27), the present research has extended the limits of the effects of closed belief systems to the sphere of affective responses to essentially non-cognitive stimuli, i.e., music. This may well have the implication that a closed belief system is a manifestation of a more global kind of closedness, i.e., a closedness to new experience generally--experience being both cognitive and affective.

As hypothesized, those with closed belief systems were less accepting of Schonberg than those with open belief systems. This finding has relevance to that aspect of the theoretical model known as the intermediate region. According to Rokeach (20) here are represented the beliefs one has about people who hold beliefs in agreement with one's own or disagreement with one's own. One aspect of closed belief systems is the binding together of acceptance and rejection of ideas with the acceptance and rejection of people. In the present context the music written by a composer may be said to be the embodiment of his beliefs about how music should sound. The Closed Belief Group, while less accepting of the new music was also less accepting of the composer Schonberg which is in line with theoretical expectations.

Though the two groups do not differ significantly in intelligence it is reasonable to assume that intelligence may have some effect, if not on reaction to music, then upon knowledge about music. Another factor which may contribute to the difference

between the groups in knowledge about music is higher aesthetic values generally, for the Open Belief than for the Closed Belief Group. If one thinks of aesthetic values as signifying an interest in the novel ways in which artists and writers order their unique experiences and of an openness to new experience and a desire to share these new ways of perceiving and experiencing--whether in art or problem solving--then plausibly, individuals with C-B systems would be less attracted to things aesthetic. This speculation is however a problem for future research.

CHAPTER IV

EXPERIMENT WITH MUSIC AND PROBLEM SOLVING

EXPERIMENT III

Rationale and General Hypotheses

In Experiments I and II support was found for the hypotheses that those with closed belief systems would be less accepting of new music as exemplified by Schonberg than those with open belief systems. Vidulich (27) found that individuals with closed belief systems were not only slower in solving a problem requiring the integration of multiple sets but that these subjects were more rejecting of the problem situation. This rejection of the problem situation was seen as mediating a failure to remember the several sets, with consequent greater difficulty with the problem. It appears that negative feelings about things new is an aspect of the closed belief system and as such, appears to be a common factor in determining both the response to new music and the response to a problem. Apparently, how one feels about a task influences how one thinks in it.

Since closed belief systems apparently have manifestations both in the affective sphere, i.e., making an affective response to music and in the cognitive sphere, i.e., solving a problem, questions concerning the relationship between cognition and affect were raised. Is a closed cognitive system iso-morphic with a closed affective-system? In what kind of a relationship do closed cognitive

systems co-exist with affective systems? Does cognitive narrowing imply affective narrowing? Does the inability to relinquish preconceived ways of thinking stem from or derive from the inability to relinquish old ways of feeling? Put yet another way, is a cognitive resistance to change a concomitant of an emotional resistance to change?

The notion of a relationship between affect and cognition is now new. Frenkel-Brunswik (8) has posited a quasi-iso-morphic correspondence between emotional and cognitive behavior. Inability to tolerate emotional ambivalence in the emotional and social spheres is hypothesized to have its counterpart in an inability to tolerate ambiguity in cognitive tasks.

May (11, p. 224) has attempted to relate anxiety avoidance to cognitive behavior.

> The avoidance of anxiety is the purpose of many behavior traits which could be called relatively "normal" and are "neurotic" only in their compulsive forms. For example rigidity of thinking which may be observed in religious or scientific dogmatism is a way of armoring one's values so that they are protected from threat. Avoidance of anxiety is temporarily achieved, but at the price of the possibilities of discovering new truth, the exclusion of new learning, and the stunting of capacities to adapt to new situations.

According to May, the special characteristics of anxiety are feelings of uncertainty and helplessness in the face of special danger. Apparently feelings of threat may be expected to result in "rigidity of thinking . . ."

Rogers (17) speaks of "openness to experience" as a prerequisite for creative thought, the essence of which is the entertaining of new ideas and the development of novel products.

Rokeach (21) takes the view that:

> The distinction between what is cognitive and what is emotional is a convenient one but by no means a necessary one. It is possible to conceive of all emotional states as having their representation in the cognitive belief-disbelief systems . . . for all the things a person feels (and wants) must surely be represented by what he believes and knows about the world he lives in.

In the literature cited, these investigators believe that a relationship exists between affect and cognition. The extent of the relationship and its manifestations are part of the problem of this study.

The basic assumption underlying this investigation is that feelings "spill over" into the cognitive sphere. Individuals with closed belief systems were found to be more rejecting of a new problem and in the present research, of new music. Negative feelings about things new appear to be a common denominator of both situations. To what extent can behavior in one situation, i.e., the music, predict behavior in the other, i.e., the problem situation?

The general hypothesis of the present study is that individuals who are most extremely negative in their feelings about a new musical system will find greater difficulty in a cognitive task requiring the integration of beliefs into a new belief system, than individuals who are relatively positive in their feelings about a new musical system.

The Cognitive Task

The cognitive task to be employed here is the same as that used by Rokeach, McGovney and Denny (23) and by Vidulich (27). It

is called the Denny Doodlebug Problem, after M. Ray Denny, who devised it in 1945. The problem is presented to the subjects on a typed sheet of paper as follows:

THE CONDITIONS

Joe Doodlebug is a strange sort of imaginary bug.

He can and cannot do the following things:

1. He can jump in only four directions--north, south, east or west, not diagonally. (Not southeast, northwest, etc.)
2. Once he starts in any direction, that is, north, south, east or west, he must jump four times in that same direction before he can switch to another direction.
3. He can only jump, not crawl, fly or walk.
4. He can jump very large distances or very small distances but not less than one inch per jump.
5. Joe cannot turn around.

THE SITUATION

Joe has been jumping all over the place getting some exercise when his master places a pile of food three feet directly west of him. Joe notices that the pile of food is a little larger than he. As soon as Joe sees all this food he stops dead in his tracks facing north. After all his exercise Joe is very hungry and wants to get to the food as quickly as he possibly can. Joe examines the situation and then says, "Darn it, I'll have to jump four times to get the food!"

THE PROBLEM

> Joe Doodlebug was a smart bug and he was dead right in his conclusion. Why do you suppose that Joe Doodlebug had to take four jumps, no more and no less, to reach the food?

The correct solution to the problem is that Joe had to take exactly four jumps because at the moment the food was presented he had already taken one jump to the east. Therefore, it was necessary for him to first take three more jumps to the east to meet the requirement of taking four jumps before changing direction. He then takes one jump to the west and lands on top of the food, thus making a total of four jumps.

The subject must first overcome three discrete sets or beliefs to solve the Doodlebug problem:

(1) the facing set: Joe does not have to face the food in order to eat it--he can land on top of it; (2) the direction set: Joe can jump sideways and backwards as well as forwards; and (3) the movement set: Joe could have been in the middle of a sequence of jumps as well as at the beginning of a sequence when the food was presented. But overcoming these three beliefs does not automatically lead to the solution. What the subject must do after overcoming the beliefs is to integrate them into a new system to gain a solution to the problem.

Specific Hypotheses

The following interrelated hypotheses were formulated:

A. Concerning total time taken to solve a problem which involves both the overcoming of sets and their integration:

Persons low in acceptance of new music should take longer to solve the problem than persons high in acceptance.

B. Concerning the integration of sets already overcome:

Persons low in the acceptance of new music should take more time in integrating the sets already overcome, than persons high in the acceptance of new music.

Subjects and Procedure

The main purpose of the initial part of this experiment was to provide a pool of subjects from which individuals would later be drawn to perform singly in the cognitive task. Two hundred and fifty-four MSU summer session students enrolled in Communication Skills and in various courses in psychology constituted this basic pool of subjects. Due, however, to the relative heterogeneity of the subjects with respect to age, and background in psychology, an arbitrary upper limit was set at age thirty-five and three courses in psychology. With this screening, the data for twenty-six individuals were discarded, leaving a pool of two hundred and twenty-nine subjects.

These subjects participated in an anonymous group experiment modeled after Experiment II and similar in most respects except for some substitutions in the music. The 19th century violin concerto of Sibelius was substituted for the 19th century Saint-Saens Sonata for piano and violin and the 20th century violin concerto of Berg was substituted for the 20th century sonata for piano and violin of Bartok. The music, as before was presented by tape recorder in two-minute excerpts in the following order: Brahms (excerpts 1 and 2), Schonberg (excerpts 1 and 2), Sibelius (excerpts 1 and 2), and Berg (excerpts 1 and 2). Subjects were asked to identify either the composer or the composition. Not one subject could. On this basis, the music was assumed to be equally unfamiliar to all. Since none of the subjects had had the dogmatism questionnaire, the same forty item measure (Appendix A) was administered.

From this pool of two hundred and twenty-nine subjects, two groups, thirty-four in each group, were chosen to perform in the individual cognitive task. The principle guiding the selection of individuals was that there should be two groups which were as equated as conditions would allow on conventional music and as different as possible on new music. In some cases it was not possible to use the subjects who were least accepting of new music. This was so because their conventional music scores were too low to be matched by the conventional music scores of individuals who were highly accepting of new music. The problem was approached by attempting to match in pairs. Though matching in pairs was not achieved, matching in groups

was, as can be seen from Table 18. In this way, two groups, a High Acceptance and a Low Acceptance group were obtained.

To avoid bias, the data made available to the experimenter to achieve this matching was a code number for each subject, his score on conventional music and his score on new music. All other identifying information, the name or the dogmatism score, were withheld. At no time prior to, or during, the individual experiment was the experimenter aware of the music group, high or low accepting, to which a given subject belonged.

From a list of subjects' names arranged by an acquaintance of the experimenter according to course and instructor, the subjects were contacted by the experimenter. They were told that their names had been chosen at random for further participation in the experiment, on an individual basis. As an inducement, they were told that they would be given a token payment of one dollar for less than an hour of their time to be spent in some pencil and paper work. All subjects contacted agreed to participate.

Each of the individual interviews was standardized. The subject was told:

"Today you are going to be given a newly devised test of general intelligence. The problem is not a simple one but the solution can be reached by good logical analysis. Here is the problem. Read it over carefully."

The mimeographed problem was handed to the subject. After he had read the problem the experimenter continued:

"I'd like to ask you to think out loud as you work the problem so I can let you know whether you are correct or not. You may ask questions as you go along and you may refer to the problem at any time. You may use the scratch paper in any way you wish. Now let's read the problem over together."

The total time allowed for the solution of the problem was forty minutes. For the first ten minutes the subject worked continuously regardless of whether he overcame any of the three sets by himself. If he did overcome any of the three sets by himself, the time taken to do so was recorded by the experimenter. At the end of the ten minutes the experimenter asked:

"Have you figured it out yet?"

If the subject had not, the experimenter gave a hint designed to overcome one of the three sets. Which hint was given depended on which set(s) the subject had already overcome by himself. If the subject had not overcome any of the three sets, the first hint was designed to overcome the facing set. The subject was then told that he would be given an additional five minutes. If no solution was forthcoming at the end of this time, the subject was given a second hint to overcome the direction set, and was given an additional five minutes. If there was still no solution at the end of this time, the subject was given a third hint designed to overcome the movement set.

In the cases where the subject overcame one set on his own within the first ten minutes, he was given the second set at the end of ten minutes, and the third set at the end of fifteen minutes.

In the cases where the subject overcame two sets within the first ten minutes by himself, he was given the third set at the end of ten minutes. This procedure was followed for all subjects without exception.

The hints were given as needed and as follows:

1. The facing set. "I'm going to give you a hint: 'Joe does not have to face the food in order to eat it'. (Repeat hint) "O.K., I'll give you five minutes more."
2. The direction set. "I'm going to give you another hint: 'Joe can jump sideways and backwards as well as forwards'." (Repeat hint) "O.K., I'll give you five minutes more."
3. The movement set. "Here is one more hint. 'Joe was moving east when the food was presented.' You have five more minutes."

After the subject had solved the problem, or at the end of forty minutes the subject was told the solution to the problem if he had not solved it. Following this he was told that the problem was not a test of intelligence, was asked not to discuss the problem with others, was thanked for his cooperation and was paid one dollar for his time.

The following quantitative measures were obtained by the experimenter for each subject:

A. Concerning the total time taken to solve the problem:
   1. Total time taken to solve the problem.

B. Concerning the overcoming of the individual sets:
   2. Time taken to overcome the first set.
   3. Time taken to overcome the first and second sets.

4. Time taken to overcome all three sets.

5. Number of sets overcome in the first five minutes.

6. Number of sets overcome in the first ten minutes.

C. Concerning the integration of the new sets after the older sets had been overcome:

7. Time taken to solve the problem after the first set was overcome.

8. Time taken to solve the problem after the first and second sets were overcome.

9. Time taken to solve the problem after all three sets were overcome.

Treatment of the Data and Statistical Considerations

Three analyses of the data were performed:

Analysis I. For two groups, a High Acceptance group and a Low Acceptance group, 34 subjects in each, equated on acceptance of conventional music, analysis was based upon the relationship between the pooled new music scores, i.e., the sum of scores for both Schonberg and Berg, and performance on the cognitive task.

Analysis II. For two groups, a High Acceptance group and a Low Acceptance group, 34 subjects in each, equated on acceptance of conventional music, analysis was based upon the relationship between scores on Schonberg alone and performance on the cognitive task.

Analysis III. Within the groups of Analysis II were 9 females in the High Acceptance and 4 females in the Low Acceptance group

with respect to Schonberg's music. An exploratory analysis was undertaken for the males alone, 25 high and 30 low in acceptance of Schonberg, equated on their acceptance of conventional music.

In view of the time limits set on the various phases of the problem, i.e., ten minutes to overcome the first set, fifteen for the second, twenty for the third and forty for the solution of the problem, the distribution of measures cannot approximate the normal curve. Consequently a distribution-free statistic was used. A rank test, White's T (4), for the significance of the difference between groups was used. This statistic tests the null hypothesis that two sets of observations are from a common population, without any assumption being made concerning the distribution of the measures in this population. One-tailed tests of significance were utilized wherever directional hypotheses were made. For the measures of time taken to overcome the individual sets, however, chi-square was used because of the large number of tied scores and the extreme negative skew.

Results: Analysis I

Table 14 presents the resuls for time taken to solve the problem. The difference, though negligible statistically, is in the predicted direction with the High Acceptance group tending toward less time to solve the problem. Thus the hypothesis which states that persons low in acceptance of new music should take longer to solve the problem than persons high in acceptance of new music is not confirmed.

TABLE 14

COMPARISON BETWEEN GROUPS HIGH AND LOW IN ACCEPTANCE OF SCHONBERG AND BERG ON THE TOTAL TIME TAKEN TO SOLVE THE DENNY DOODLEBUG PROBLEM

Group	N	Mean Times*	Z	p
High Acceptance	34	25.91		
			.245	.42
Low Acceptance	34	26.39		

*The mean times, presented for comparison purposes, do not enter into the computation of the non-parametric statistic utilized.

Concerning time taken to solve the problem after each of the sets is overcome, as seen in Table 15, none of the results is significant. While the direction of the results favors the Low Acceptance group after the first set is overcome, the direction shifts after the second and third sets. Thus the hypothesis that persons low in acceptance of new music should take more time integrating the sets already overcome than persons high in receptivity is not confirmed.

As indicated by Table 17, no significant differences were found on the number of sets overcome either within the first five or first ten minutes. Thus the null hypothesis that the High Acceptance group will not differ from the Low Acceptance group in the number of sets overcome is not rejected.

From Table 18 it is seen that the two groups were well matched on Age, ACE ((22 of the High Acceptance and 32 of the Low Acceptance scores available) and on Conventional Music. With respect to Dogmatism, the groups differ in the direction anticipated on the basis of the findings in Experiments I and II in which individuals who were high in dogmatism were relatively less accepting of Schonberg than individuals who were low in dogmatism.

In summary, although none of the hypotheses are confirmed, the direction of the differences on problem solving time (Table 14) and in two of the three integration times (Table 15) is toward lower time scores for those high in acceptance of the Schonberg and Berg music.

TABLE 15

COMPARISON BETWEEN GROUPS HIGH AND LOW IN ACCEPTANCE OF SCHONBERG AND BERG ON MEAN INTEGRATION TIME AFTER THE FIRST, SECOND AND THIRD SETS ARE OVERCOME

Group	N	After First Set			After Second Set			After Third Set		
		Mean Time*	Z	p	Mean Time	Z	p	Mean Time	Z	p
High Acceptance	34	19.76	.263	.40	14.04	.215	.42	9.75	.343	.38
Low Acceptance	34	19.21			14.87			10.44		

*The mean times presented for comparison purposes, do not enter into the computation of the non-parametric statistic utilized.

TABLE 16

COMPARISON BETWEEN GROUPS HIGH AND LOW IN ACCEPTANCE OF SCHONBERG AND BERG ON THE MEAN TIME TAKEN TO OVERCOME THE FIRST, SECOND AND THIRD SETS

Group	N	First Set	Second Set	Third Set
High Acceptance	34	6.31	11.72	16.30
Low Acceptance	34	7.46	11.80	16.21

Tests of significance of the differences presented here were not computed because of the extreme skewness of the data and the large number of tied scores present.

TABLE 17

NUMBER OF SETS OVERCOME WITHIN THE FIRST FIVE MINUTES AND WITHIN THE FIRST TEN MINUTES BY GROUPS HIGH AND LOW IN ACCEPTANCE OF SCHONBERG AND BERG

Group	N	0	1	2	3	Chi^2	df*	p
I. Number of sets overcome within first 5 minutes								
High Acceptance	34	20	12	2	0			
						1.029	1	N.S.
Low Acceptance	34	24	9	1	0			
II. Number of sets overcome within first 10 minutes								
High Acceptance	34	17	13	4	0			
						.536	1	N.S.
Low Acceptance	34	20	12	2	0			

*To avoid small cell frequencies, data for 1, 2 and 3 sets were combined.

TABLE 18

AGE, INTELLIGENCE, CONVENTIONAL MUSIC AND DOGMATISM SCORES OF THE HIGH AND LOW RECEPTIVE GROUPS (SCHONBERG AND BERG)

Variable	Group	N	Mean	Sigma	t	p
Age	High Acceptance	34	22.94	3.20	.69	N.S.
	Low Acceptance	34	22.35	3.76		
ACE*	High Acceptance	22	5.36	2.46	.18	N.S.
	Low Acceptance	32	5.47	1.90		
Conventional Music	High Acceptance	34	17.32	7.72	.84	N.S.
	Low Acceptance	34	15.70	7.91		
Dogmatism**	High Acceptance	23	151.95	22.47	.64	N.S.
	Low Acceptance	24	156.45	24.38		

* 22 High and 32 Low Acceptance scores available.
** 23 High and 24 Low Acceptance scores available.

Results: Analyses II and III

In Experiments I and II, differences in dogmatism were found to be more closely related to Schonberg than to the other new music, i.e., Bartok. Consequently a second analysis based upon the scores on Schonberg alone rather than on the pooled scores of Schonberg and Berg was undertaken. A separate analysis was conducted for the two main groups of subjects, thirty-four in each of the groups High and Low in Acceptance of Schonberg. Another analysis was undertaken for the males alone, twenty-five and thirty in the High Acceptance and Low Acceptance groups.

Hypothesis I states that individuals low in acceptance of new music should take longer to solve the problem than individuals high in acceptance of new music. Table 19 summarizes the results on the total time taken to solve the problem. For the two main groups, though the difference is not significant ($p=.19$) it is in the predicted direction. The High Acceptance group tends to solve the problem in less time than the Low Acceptance group.

Analysis of the data for males alone seems to accentuate slightly these differences, the High Acceptance males tending toward a faster solution to the problem ($p=.14$) than the Low Acceptance males.

Turning now to a comparison between groups on time taken to solve the problem after the first, second and third sets are overcome, Table 20 summarizes the results. For the main groups,

TABLE 19

COMPARISONS BETWEEN GROUPS HIGH AND LOW IN ACCEPTANCE OF SCHONBERG ON THE TOTAL TIME TAKEN TO SOLVE THE DENNY DOODLEBUG PROBLEM

Main Groups	N	Mean Time*	Z	p
High Acceptance	34	25.70	.852	.19
Low Acceptance	34	27.00		
Males				
High Acceptance	25	24.50	1.058	.14
Low Acceptance	30	27.26		

*The mean times, presented for comparison purposes, do not enter into the computation of the non-parametric statistic utilized.

TABLE 20

COMPARISON BETWEEN GROUPS HIGH AND LOW IN ACCEPTANCE OF SCHONBERG ON TIME TAKEN TO SOLVE THE PROBLEM AFTER THE FIRST, SECOND AND THIRD SETS ARE OVERCOME

Main Groups	N	After First Set			After Second Set			After Third Set		
		Mean Time*	Z	p	Mean Time	Z	p	Mean Time	Z	p
High Acceptance	34	19.41	.325	.38	14.088	.318	.38	9.65	.503	.30
Low Acceptance	34	19.57			15.11			10.54		
Males										
High Acceptance	25	18.08	.786	.22	12.81	+1.115	.14	8.41	1.090	.14
Low Acceptance	30	19.41			15.17			10.61		

*Mean times, presented for comparison purposes, do not enter into the computation of the non-parametric statistic utilized.

the differences, though not significant, tend toward less time for the High Acceptance group in solving the problem after each of the sets is overcome.

Analysis of the data for males only slightly accentuates these differences. As can be seen, the High Acceptance males tend toward less time to solve the problem after the first set ($p=.22$), after the second set ($p=.15$), and after the third set ($p=.15$).

Summarizing, some support for Hypothesis II, which states that individuals who are low in acceptance of new music will take longer to solve the problem after the sets are overcome, is given by comparison of High and Low Acceptance males. When females are included, i.e., the main group, the differences are less sharp.

Tables 21 and 22 indicate that in none of the analyses of number of sets overcome in the first five or first ten minutes does the High Acceptance differ from the Low Acceptance group.

Table 24 presents the data on Age, intelligence as measured by the ACE, Conventional Music and Dogmatism, for the Main Group of subjects. None of the differences is significant. As anticipated, in the light of the findings in Experiments I and II, the difference in Dogmatism (21 High Acceptance and 26 Low Acceptance scores available) approaches significance, with the High Acceptance group lower in Dogmatism than the Low Acceptance group.

Table 25 presents Age, ACE, Conventional Music and Dogmatism data for males only. So far as can be determined from the incomplete

TABLE 21

NUMBER OF SETS OVERCOME WITHIN THE FIRST FIVE MINUTES BY GROUPS HIGH AND LOW IN ACCEPTANCE OF SCHONBERG

Main Groups	N	0	1	2	3	Chi^2	df*	p
High Acceptance	34	20	12	2	0	1.029	1	N.S.
Low Acceptance	34	24	9	1	0			
Males								
High Acceptance	25	15	8	2	0	1.77	1	N.S.
Low Acceptance	30	23	6	1	0			

*To avoid small cell frequencies, data for 1, 2 and 3 sets were combined.

TABLE 22

NUMBER OF SETS OVERCOME WITHIN THE FIRST TEN MINUTES BY GROUPS HIGH AND LOW IN ACCEPTANCE OF SCHONBERG

Main Groups	N	0	1	2	3	Chi^2	df*	p
High Acceptance	34	17	13	4	0	.536	1	N.S.
Low Acceptance	34	20	12	2	0			
Males								
High Acceptance	25	14	8	3	0	.305	1	N.S.
Low Acceptance	30	19	10	1	0			

*To avoid small cell frequencies, data for 1, 2 and 3 sets were combined.

TABLE 23

COMPARISONS BETWEEN GROUPS HIGH AND LOW IN ACCEPTANCE OF SCHONBERG ON THE MEAN TIME TAKEN TO OVERCOME THE FIRST, SECOND AND THIRD SETS

Main Groups	N	First Set	Second Set	Third Set
High Acceptance	34	6.31	11.60	16.05
Low Acceptance	34	7.46	11.91	16.45
Males				
High Acceptance	25	6.60	11.84	16.24
Low Acceptance	30	7.99	12.11	16.65

Tests of significance of the differences presented here were not computed because of the extreme skewness of the data and the large number of tied scores present.

TABLE 24

AGE, INTELLIGENCE, CONVENTIONAL MUSIC AND DOGMATISM SCORES OF THE GROUPS (MALES AND FEMALES) HIGH AND LOW IN ACCEPTANCE OF SCHONBERG

Variable	Group	N	Mean	Sigma	t	p
Age	High Acceptance	34	22.44	3.71	.48	N.S.
	Low Acceptance	34	22.85	3.26		
ACE*	High Acceptance	22	5.77	2.31	.30	N.S.
	Low Acceptance	32	5.18	2.10		
Conventional Music	High Acceptance	34	17.17	7.88	.69	N.S.
	Low Acceptance	34	15.85	7.48		
Dogmatism**	High Acceptance	21	148.14	21.25	1.56	.10
	Low Acceptance	26	159.19	25.27		

* 22 High and 32 Low acceptance scores available
** 21 High and 26 Low acceptance scores available

TABLE 25

AGE, INTELLIGENCE, CONVENTIONAL MUSIC AND DOGMATISM SCORES OF THE GROUPS (MALES ONLY) HIGH AND LOW IN ACCEPTANCE OF SCHONBERG

Variable	Group	N	Mean	Sigma	t	p
Age	High Acceptance	25	22.28	3.32	.205	N.S.
	Low Acceptance	30	23.20	3.31		
ACE*	High Acceptance	17	6.12	1.83	.183	N.S.
	Low Acceptance	29	5.38	2.02		
Conventional Music	High Acceptance	25	16.96	8.95	.129	N.S.
	Low Acceptance	30	15.53	7.49		
Dogmatism**	High Acceptance	15	149.33	16.077	.201	N.S.
	Low Acceptance	25	157.88	24.88		

* 17 High and 29 Low acceptance scores available
** 15 High and 25 Low acceptance scores available

ACE data, the groups do not differ significantly on intelligence. On Dogmatism, the High Acceptance group tends to have a lower mean score than the Low Acceptance group.

Discussion of Experiment III

The results, though not significant, are in the hypothesized direction and hence may be considered suggestive of a relationship between negative feelings about new music (Schonberg) and performance in a new problem situation. Reasons for failure to obtain clearly confirmatory results may be sought at three levels: (1) the nature of the two tasks, (2) statistical considerations, and (3) theoretical considerations.

(1) The Nature of the Two Tasks -- Though there is some similarity between listening to a new piece of music and working a new problem in that both situations are outside the realm of the individual's previous experience, there are also important differences. Checking adjectives is a relatively passive act while solving a problem involves initiative and activity. The problem solver has to "come to grips" with the problem so that he reaches a solution for which external criteria have been pre-determined. The music situation does not require the same degree of effort and personal involvement, nor are there external criteria for judging the correctness of the response. The tasks differ on the dimension of simplicity-complexity with a vast difference between checking adjectives and solving a problem too difficult for most individuals without help.

Thus, in addition to the cognitive-affective dimensions, the two tasks differ on the passivity-activity and simplicity-complexity dimensions so that different psychological processes would likely be invoked for the two tasks. In view of the differences in the tasks along these several dimensions, it seems surprising that any prediction, even as little as that which was achieved, was possible. A re-test of the hypotheses equating tasks on complexity as well as on the degree of coming to grips would perhaps yield more conclusive results.

(2) Statistical Considerations -- The amount of common variance between scores on the dogmatism scale and the response to new music is small, as suggested by the low relationship found in Experiment II, Excerpt 2 (Table 5). It follows that for any given score on the new music, the score on dogmatism may be high, middle low or any in between. Both Rokeach, McGovney and Denny (23) and Vidulich (27) found that performance on the problem was related to extreme scores on dogmatism, i.e., those high were slower and those low were faster in integrating sets and solving the problem. It would be expected that only that part of the response to new music which is correlated with dogmatism would affect problem solving in the same way that dogmatism does. In view of the low common variance, individuals selected on the basis of extreme music scores would include middle as well as high and low scorers on dogmatism. Given the results of Experiment II and its methodology, the results of the present experiment should have been predictable by the computation of a correlation coefficient.

(3) Theoretical Considerations -- In searching for a relationship between feeling and cognition, only a single affective dimension viz. like-dislike was considered. Theoretical considerations from another framework, psychoanalytic, suggests an alternative view of this problem. The term Isolation in psychoanalytic theory refers to a fragmentation of conscious experience that (1) either keeps apart ideas that belong together emotionally, or (2) keeps apart ideas and the affects corresponding to them. Rokeach has been concerned mainly with the first manifestation of isolation in his use of the term. In the Doodlebug studies, individuals high in dogmatism were found to have difficulty putting "ideas" (sets) together which belong together. Is it the case that both (1) and (2) are part of the same syndrome? May we expect that fragmentation of idea, i.e., cognitive narrowing, co-exists with separating feeling from ideas, a kind of affective narrowing?

We should like to reformulate our hypotheses to take into account the notion of affective narrowing and its opposite, affective breadth. The general hypothesis is that there exists an iso-morphic correspondence between affective narrowing and constriction with cognitive narrowing and constriction. Expectations are that individuals who are limited in the range of affects which they can experience will exhibit a parallel limitation in the range of ideas they can entertain. The converse iso-morphism between degree of openness, breadth and intensity of affect with openness breadth and extensity of cognition is also expected. Operationally, it would be expected that

individuals who could or could not perform well in tasks requiring sensitivity to diverse types of affect would or would not perform well in tasks requiring openness to new ideas.

CHAPTER V

SUMMARY AND CONCLUSIONS

Three interrelated experiments were undertaken, all of which are in the conceptual framework of Rokeach on open and closed belief systems. The purpose of Experiment I was to investigate the relationship between open and closed belief systems and response to new music. From the theoretical model it was hypothesized that those with closed belief systems would be less accepting of new music than those with open belief systems. It was further hypothesized that those with closed belief systems would be less accepting of the composer than those with open belief systems.

One hundred and thirty-three subjects who had taken the dogmatism scale, the measure of open and closed belief systems, were exposed to two unfamiliar samples of music, one conventional, exemplified by Brahms, and the other extremely modern, exemplified by Schonberg. Using extreme groups, the results indicate that those with closed belief systems are less accepting of the new music and are also less accepting of the composer than those with open belief systems. No significant differences were found between these groups in age, intelligence as estimated from the ACE, acceptance of conventional music or knowledge about music.

Experiment II was designed to enlarge the scope of the previous experiment by increasing the number of musical examples and by testing two hypotheses in addition to the two tested previously. The additional hypotheses were to the effect that, given

successive exposures to new music, that those with relatively open belief systems would show a significantly larger gain in acceptance of the new music than those with closed belief systems. A parallel hypothesis was made concerning the acceptance of the composer.

As before, one hundred and forty-seven subjects who had taken the dogmatism scale were exposed to eight unfamiliar musical excerpts, two each from each of two conventional (Brahms and Saint-Saens) and two modern (Schonberg and Bartok) composers. Using extreme groups, the results lend support to the hypotheses for the Schonberg composition, interpreted as being more extremely new, but not for the Bartok, the less extreme sample. The findings concerning the composer parallels that of the music. One striking finding in this study is that the open belief group knows more about serious music in the absence of any observable difference in formal training. This difference in knowledge about music was assumed to be a manifestation of higher aesthetic values of individuals with open belief systems.

In Experiment III, the relationship between affect and cognition was explored. Using a cognitive task requiring both the overcoming and the integration of sets, hypotheses were formulated that: individuals most extremely negative in their feelings about a new musical system would be slower in solving the problem and would find greater difficulty in integrating the sets into a new belief system, than individuals extremely positive in their feelings about new music.

Two hundred and twenty-nine subjects participated in an anonymous group experiment modeled after Experiment II with some modifications in the music. From this pool, two groups, thirty-four in each group were chosen to perform in the individual cognitive task. They were chosen so that they were as equated as conditions would allow on conventional music but as different as possible on new music. Though no significant differences were found, the differences were in the direction predicted by the hypotheses suggesting that a low order relationship may exist between acceptance of new music and performance in a cognitive task.

Failure to confirm the hypotheses was explained in terms of the difference in the nature of the two tasks, i.e., reacting to music vs. solving a problem, and in terms of statistical considerations, given the results of the previous study. A reformulation of the hypotheses positing a parallelism between the range of affect and the range of cognitive functioning was suggested. The notion of affective narrowing is hypothesized as co-occurring with cognitive narrowing and conversely, affective openness with cognitive openness.

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APPENDICES

APPENDIX A

THE DOGMATISM SCALE

DO NOT SIGN YOUR NAME

The following is a study of what the general public thinks and feels about a number of important social and personal questions. The best answer to each statement below is your personal opinion. We have tried to cover many different and opposing points of view; you may find yourself agreeing strongly with some of the statements, disagreeing just as strongly with others, and perhaps uncertain about others; whether you agree or disagree with any statement, you can be sure that many other people feel the same as you do.

Mark each statement in the left margin according to how much you agree or disagree with it. Please mark every one. Write +1, +2, +3, or -1, -2, -3, depending on how you feel in each case.

+1:	I AGREE A LITTLE	-1:	I DISAGREE A LITTLE
+2:	I AGREE ON THE WHOLE	-2:	I DISAGREE ON THE WHOLE
+3:	I AGREE VERY MUCH	-3:	I DISAGREE VERY MUCH

_____ 1. A person who thinks primarily of his own happiness is beneath contempt.

_____ 2. The main thing in life is for a person to want to do something important.

_____ 3.* I wish people would be more definite about things.

_____ 4. In a discussion I often find it necessary to repeat myself several times to make sure I am being understood.

_____ 5. Most people just don't know what's good for them.

_____ 6.* I don't like to work on a problem unless there is the possibility of coming out with a clear-cut and unambiguous answer.

_____ 7. In times like these, a person must be pretty selfish if he considers his own happiness primarily.

_____ 8. A man who does not believe in some great cause has not really lived.

*Filler items.

+1: I AGREE A LITTLE -1: I DISAGREE A LITTLE

+2: I AGREE ON THE WHOLE -2: I DISAGREE ON THE WHOLE

+3: I AGREE VERY MUCH -3: I DISAGREE VERY MUCH

_____ 9.* I am in favor of a very strict enforcement of all laws, no matter what the consequences.

_____ 10. I'd like it if I should find someone who would tell me how to solve my personal problems.

_____ 11. Of all the different philosophies which have existed in this world there is probably only one which is correct.

_____ 12.* For most questions there is just one right answer once a person is able to get all the facts.

_____ 13. It is when a person devotes himself to an ideal or cause that his life becomes meaningful.

_____ 14. In this complicated world of ours the only way we can know what is going on is to rely upon leaders or experts who can be trusted.

_____ 15.* The trouble with many people is that they don't take things seriously enough.

_____ 16. There are a number of persons I have come to hate because of the things they stand for.

_____ 17. There is so much to be done and so little time to do it in.

_____ 18.* It bothers me when something unexpected interrupts my daily routine.

_____ 19. It is better to be a dead hero than a live coward.

_____ 20. A group which tolerates too much difference of opinion among its own members cannot exist for long.

_____ 21.* I often start things I never finish.

_____ 22. It is only natural that a person should have a much better acquaintance with ideas he believes in than with ideas he opposes.

_____ 23. While I don't like to admit this even to myself, I sometimes have the ambition to become a great man, like Einstein, or Beethoven, or Shakespeare.

_____ 24.* I set a high standard for myself and feel others should do the same.

---

*Filler items.

+1: I AGREE A LITTLE -1: I DISAGREE A LITTLE

+2: I AGREE ON THE WHOLE -2: I DISAGREE ON THE WHOLE

+3: I AGREE VERY MUCH -3: I DISAGREE VERY MUCH

_____ 25. Even though freedom of speech for all groups is a worthwhile goal, it is unfortunately necessary at times to restrict the freedom of certain political groups.

_____ 26. If a man is to accomplish his mission in life it is sometimes necessary to gamble "all or nothing at all."

_____ 27.* People who seem unsure and uncertain about things make me feel uncomfortable.

_____ 28. Most people just don't give a "damn" about others.

_____ 29. A person who gets enthusiastic about a number of causes is likely to be a pretty "wishy-washy" sort of person.

_____ 30.* Most of the arguments or quarrels I get into are over matters of principle.

_____ 31. To compromise with our political opponents is dangerous because it usually leads to the betrayal of our own side.

_____ 32. If given the chance I would do something that would be of great benefit to the world.

_____ 33.* I don't like things to be uncertain and unpredictable.

_____ 34. In times like these it is often necessary to be more on guard against ideas put out by certain people or groups in one's own camp than by those in the opposing camp.

_____ 35. In a heated discussion I generally become so absorbed in what I am going to say that I forget to listen to what the others are saying.

_____ 36.* I think that I am stricter about right and wrong than most people.

_____ 37. Once I get wound up in a heated discussion I just can't stop.

_____ 38. There are two kinds of people in this world: those who are on the side of truth and those who are against it.

_____ 39.* It is annoying to listen to a lecturer who cannot seem to make up his mind as to what he really believes.

_____ 40. Man on his own is a helpless and miserable creature.

---

*Filler items.

+1: I AGREE A LITTLE -1: I DISAGREE A LITTLE

+2: I AGREE ON THE WHOLE -2: I DISAGREE ON THE WHOLE

+3: I AGREE VERY MUCH -3: I DISAGREE VERY MUCH

_____ 41. The United States and Russia have just about nothing in common.

_____ 42.* Once I have my mind made up I seldom change it.

_____ 43. In the history of mankind there have probably been just a handful of really great thinkers.

_____ 44. The highest form of government is a democracy and the highest form of democracy is a government run by those who are most intelligent.

_____ 45.* I always see to it that my work is carefully planned and organized.

_____ 46. The present is all too often full of unhappiness. It is the future that counts.

_____ 47. Unfortunately, a good many people with whom I have discussed important social and moral problems don't really understand what is going on.

_____ 48.* Our thinking would be a lot better off if we would just forget about words like "probably", "approximately" and "perhaps".

_____ 49. Fundamentally, the world we live in is a pretty lonely place.

_____ 50. It is often desirable to reserve judgment about what's going on until one has had a chance to hear the opinions of those one respects.

_____ 51.* I like to have a place for everything and everything in its place.

_____ 52. The worst crime a person can commit is to attack publicly the people who believe in the same thing he does.

_____ 53. In the long run the best way to live is to pick friends and associates whose tastes and beliefs are the same as one's own.

_____ 54.* I never make judgments about people until I am sure of the facts.

---

*Filler items.

+1:	I AGREE A LITTLE	-1:	I DISAGREE A LITTLE
+2:	I AGREE ON THE WHOLE	-2:	I DISAGREE ON THE WHOLE
+3:	I AGREE VERY MUCH	-3:	I DISAGREE VERY MUCH

_____ 55. Most of the ideas which get published nowadays aren't worth the paper they are printed on.

_____ 56. It is only natural for a person to be rather fearful of the future.

_____ 57.* I am known as a hard and steady worker.

_____ 58. My blood boils whenever a person stubbornly refuses to admit he's wrong.

_____ 59. When it comes to differences of opinion in religion we must be careful not to compromise with those who believe differently from the way we do.

_____ 60.* I find that a well-ordered mode of life, with regular hours and an established routine, is congenial to my temperament.

_____ 61.* A strong person will be able to make up his mind even on the most difficult questions.

_____ 62.* It is hard for me to sympathize with a person who is always doubting and unsure about things.

---

*Filler items.

APPENDIX B

Please fill in the following information. DO NOT SIGN YOUR NAME

Date _____ Sex _____ Date of Birth _____

City and State of Birth _____ Religious denomination _____

Race or national extraction _____.

The following is a musical interest survey. The answers you give will have no bearing whatever on your grade in this course. The information is for research purposes only.

Please fill in the blank.

1. I have studied classical music (instrumental or vocal)for _____ years.
2. I spend about _____ hours a week listening to classical music.
3. I attended _____ concerts of classical music since September 1954.
4. I have taken _____ courses pertaining to classical music while at MSU.
5. Of the following types of music, I get <u>most</u> enjoyment from (1) Classical, (2) Semi-classical, (3) Jazz, (4) None of these. (Please underline which <u>one</u>.)

You are about to hear two excerpts of music. After each excerpt, write the name of the composition and the composer. If you don't know, write D.K.

	Title of Composition	Composer
1.	_____	_____
2.	_____	_____

If you have ever heard either of these compositions before, please circle the appropriate number above.

****

You will now hear the same compositions again. This time I would like your reaction to the compositions, that is, the way you feel about them as music, whether you like or dislike them. Please be as frank as you can. Remember it is your personal opinion we want. Will you please check the adjectives which you feel apply to the first composition. Do not place a check if, in your opinion, the adjective doesn't apply.

Adjectives	First Composition
Beautiful	
Ugly	
Melodious	
Noisy	
Refined	
Vulgar	
Graceful	
Clumsy	
Creative	
Impulsive	
Coherent	
Gibberish	
Interesting	
Dull	
Noble	
Coarse	

Adjectives	First Composition
Novel	
Senseless	
Profound	
Superficial	
Attractive	
Repulsive	
Unusual	
Impossible	
Clever	
Simpleminded	
Imaginative	
Fantastic	
Stimulating	
Depressing	

Please check those adjectives which express your opinion about the first composer.

Adjectives	First Composer
Genius	
Crack-pot	
Brilliant	
Dull	
Sensitive	
Insensitive	
Inspired	
Weary	
Individualistic	
Peculiar	
Logical	
Disorganized	
Alert	
Apathetic	
Profound	
Shallow	
Planful	
Muddleheaded	
Democratic	
Autocratic	
Tolerant	
Intolerant	
Mild	
Hostile	
Confident	
Fearful	

Adjectives	First Composer
Blustery	
Reserved	
Witty	
Silly	

Please check the adjectives which you feel apply to the second composition.

Adjectives	Second Composition
Beautiful	
Ugly	
Melodious	
Noisy	
Refined	
Vulgar	
Graceful	
Clumsy	
Creative	
Impulsive	
Coherent	
Gibberish	
Interesting	
Dull	
Noble	
Coarse	
Novel	
Senseless	
Profound	
Superficial	
Attractive	
Repulsive	
Unusual	
Impossible	
Clever	
Simpleminded	

Adjectives	Second Composition
Imaginative	
Fantastic	
Stimulating	
Depressing	

Please check the adjectives which express your opinion about the second composer.

Adjectives	Second Composer
Genius	
Crack-pot	
Brilliant	
Dull	
Sensitive	
Insensitive	
Inspired	
Weary	
Individualistic	
Peculiar	
Logical	
Disorganized	
Alert	
Apathetic	
Profound	
Shallow	
Planful	
Muddleheaded	
Democratic	
Autocratic	
Tolerant	
Intolerant	
Mild	
Hostile	
Confident	
Fearful	

Adjectives	Second Composer
Blustery	
Reserved	
Witty	
Silly	

Below is an alphabetical list of composers and a list of compositions. Place the number of the composer in the appropriate blank next to the composition. You have about 10 minutes to complete it.

Composer	Composition
1. Bach	Moonlight Sonata ____
2. Bartok	Afternoon of a Faun ____
3. Beethoven	Incidental Music to Midsummer Night's Dream ____
4. Berlioz	Bolero ____
5. Bizet	Aida ____
6. Chopin	Carmen ____
7. Debussy	Finlandia ____
8. Dukas	Rhapsody in Blue ____
9. Dvorak	Nutcracker Suite ____
10. Gershwin	La Mer ____
11. Hindemith	New World Symphony ____
12. Liszt	Italian Symphony ____
13. Mendelssohn	Tales of Hoffman ____
14. Mozart	Romeo and Juliet Overture ____
15. Offenbach	Till Eulenspiegel ____
16. Prokofieff	Mathis der Maler ____
17. Ravel	Roman Carnival Overture ____
18. Rossini	Sorcerer's Apprentice ____
19. Schonberg	Eroica Symphony ____
20. Schubert	Transfigured Night ____
21. Sibelius	Marche Slave ____
22. Strauss	Minute Waltz ____
23. Stravinsky	Rites of Spring ____
24. Tchaikowsky	Firebird Suite ____
25. Verdi	Emperor Concerto ____
	Petrouchka ____
	William Tell ____
	Hungarian Rhapsody #2 ____
	Appassionata Sonata ____

APPENDIX C

Please fill in the following information. DO NOT SIGN YOUR NAME

Date _____ Sex _____ Date of Birth _____

City and State of Birth _____ Religious denomination _____

Race or national extraction _____.

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5. Of the following types of music, I get <u>most</u> enjoyment from (1) Classical, (2) Semi-classical, (3) Jazz, (4) None of these. (Please underline which <u>one</u>.)

Title of Composition _____ Composer _____

Please check the adjectives which you feel apply to the composition.

Beautiful _____	Coarse _____
Ugly _____	Novel _____
Melodious _____	Senseless _____
Noisy _____	Profound _____
Refined _____	Superficial _____
Vulgar _____	Attractive _____
Graceful _____	Repulsive _____
Clumsy _____	Unusual _____
Creative _____	Impossible _____
Impulsive _____	Clever _____
Coherent _____	Simpleminded _____
Gibberish _____	Imaginative _____
Interesting _____	Fantastic _____
Dull _____	Stimulating _____
Noble _____	Depressing _____

Please check the adjectives which express your opinion about the composer.

Genius _____	Shallow _____
Crack-pot _____	Planful _____
Brilliant _____	Muddleheaded _____
Dull _____	Democratic _____
Sensitive _____	Autocratic _____
Insensitive _____	Tolerant _____
Inspired _____	Intolerant _____
Weary _____	Mild _____
Individualistic _____	Hostile _____
Peculiar _____	Confident _____
Logical _____	Fearful _____
Disorganized _____	Blustery _____
Alert _____	Reserved _____
Apathetic _____	Witty _____
Profound _____	Silly _____

Title of Composition _____ Composer _____

Please check the adjectives which you feel apply to the composition.

Beautiful _____	Coarse _____
Ugly _____	Novel _____
Melodious _____	Senseless _____
Noisy _____	Profound _____
Refined _____	Superficial _____
Vulgar _____	Attractive _____
Graceful _____	Repulsive _____
Clumsy _____	Unusual _____
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Impulsive _____	Clever _____
Coherent _____	Simpleminded _____
Gibberish _____	Imaginative _____
Interesting _____	Fantastic _____
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Please check the adjectives which express your opinion about the composer.

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Crack-pot _____	Planful _____
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Peculiar _____	Confident _____
Logical _____	Fearful _____
Disorganized _____	Blustery _____
Alert _____	Reserved _____
Apathetic _____	Witty _____
Profound _____	Silly _____

Title of Composition _____ Composer _____

Please check the adjectives which you feel apply to the composition.

Beautiful _____	Coarse _____
Ugly _____	Novel _____
Melodious _____	Senseless _____
Noisy _____	Profound _____
Refined _____	Superficial _____
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Apathetic _____	Witty _____
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Interesting _____	Fantastic _____
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Please check the adjectives which express your opinion about the composer.

Genius	_____	Shallow	_____
Crack-pot	_____	Planful	_____
Brilliant	_____	Muddleheaded	_____
Dull	_____	Democratic	_____
Sensitive	_____	Autocratic	_____
Insensitive	_____	Tolerant	_____
Inspired	_____	Intolerant	_____
Weary	_____	Mild	_____
Individualistic	_____	Hostile	_____
Peculiar	_____	Confident	_____
Logical	_____	Fearful	_____
Disorganized	_____	Blustery	_____
Alert	_____	Reserved	_____
Apathetic	_____	Witty	_____
Profound	_____	Silly	_____

Title of Composition _____ Composer _____

Please check the adjectives which you feel apply to the composition.

Beautiful _____	Coarse _____
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Melodious _____	Senseless _____
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Below is an alphabetical list of composers and a list of compositions. Place the number of the composer in the appropriate blank next to the composition. You have about 10 minutes to complete it.

Composer	Composition
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6. Chopin	Carmen ____
7. Debussy	Finlandia ____
8. Dukas	Rhapsody in Blue ____
9. Dvorak	Nutcracker Suite ____
10. Gershwin	La Mer ____
11. Hindemith	New World Symphony ____
12. Lizst	Italian Symphony ____
13. Mendelssohn	Tales of Hoffman ____
14. Mozart	Romeo and Juliet Overture ____
15. Offenbach	Till Eulenspiegel ____
16. Prokofieff	Mathis der Maler ____
17. Ravel	Roman Carnival Overture ____
18. Rossini	Sorcerer's Apprentice ____
19. Schonberg	Eroica Symphony ____
20. Schubert	Transfigured Night ____
21. Sibelius	Marche Slave ____
22. Strauss	Minute Waltz ____
23. Stravinsky	Rites of Spring ____
24. Tchaikowsky	Firebird Suite ____
25. Verdi	Emperor Concerto ____
	Petrouchka ____
	William Tell ____
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