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ABSTRACT

The research program reported here is designed to develop a procedure for assessing sensitivity to dimensional components of non-representational art. The program was based on the assumption that non-representational art can be described in terms of empirically specifiable dimensions, and that an individual's sensitivity to or his appreciation of these dimensions is indicated by his esthetic reactions. Multidimensional scaling analyses were employed to yield a provisional characterization of the dimensions employed by subjects in grouping paintings contained in 2 sets of 40 abstract works. The "distances" among paintings, expressed in terms of their loadings on various dimensions, provide a standard against which to assess a subject's estimate of their similarity. Work is currently being undertaken to determine the relationship between the accuracy of these estimates and esthetic preference. (Author)

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December, 1970

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SUMMARY

The research program reported here was designed to develop a procedure for assessing sensitivity to dimensional components of non-representational art. The program is based on the assumption that non-representational art can be described in terms of empirically specifiable dimensions, and that an individual's sensitivity to, or his appreciation of these dimensions is importantly implicated in his esthetic reactions. Multidimensional scaling analyses were employed to yield a provisional characterization of the dimensions employed by subjects in grouping paintings contained in two sets of 40 abstract works. The "distances" among paintings, expressed in terms of their loadings on various dimensions, provides a standard against which to assess an individual subject's estimates of their similarity. Work is currently being undertaken to determine the relationship between the accuracy of these estimates and esthetic preference.

INTRODUCTION

The present authors' initial interest in an empirical approach to esthetic sensitivity was stimulated by the imaginative studies conducted by Child and his colleagues (e.g., Child, 1965; Child & Sumiko, 1968). Child's basic procedure for evaluating esthetic sensitivity involved comparing a subject's artistic preferences or evaluations of artistic merit with the consensually established judgments of experts (e.g., artists, art critics, and art students). Although the relationships between scores derived from this procedure and a variety of cognitive and personality variables were provocative, the methodology, in focusing exclusively on a subject's evaluative predispositions toward art objects, ignored other dimensions of esthetic experience.

This limitation in mind, the present authors attempted to develop an instrument for appraising certain structural properties of esthetic reactions. Our initial efforts were devoted to constructing an "Esthetic Cognitive Complexity Test" patterned after Bieri's (1966) modification of Kelly's Role Construct Repertory Test (Kelly, 1955). The proposed measure differed from the "Rep" Test in the substitution of art objects for persons as the target stimuli, and in the substitution of esthetically relevant for interpersonally relevant judgmental dimensions. Our primary intent was to establish the reliability of this test over time and across sets of art objects, and to investigate its relationship to such variables as performance in art courses, tolerance for apparent incongruities in art objects, interpersonal cognitive complexity, and intelligence.

Sanguine that our approach was workable, we proceeded to show a large number of paintings to college students, asking them to write down the adjective or adjectival phrase most appropriate to each painting. Categorizing several hundred adjectives collected in this manner according to similarity, we selected a group of ten representative adjectives and their opposites (e.g., graceful-awkward, free-constricted, happy-sad) for use in a preliminary version of the measure. Respondents were asked to rate each of 7 paintings, simultaneously projected on a screen, on each of the ten bipolar scales.

After they had completed the instrument, nearly all of the respondents complained about the difficulty of the task and questioned the appropriateness of the adjectives to at least some of the paintings. Several of the respondents said that they felt extremely

uncertain about most of their ratings. The same general reaction was given by the next several groups of subjects we ran. Most important, inspection of the data revealed little inter-judge consistency. At this point, we felt that we understood why Osgood (1957) had characterized a factor analysis of non-artists' ratings of abstract paintings as "semantic chaos". In our study, as well as in the one described by Osgood, respondents had been asked to react in verbal terms to visual stimuli which probably have a paucity of precise verbal referents.

At this point, we considered alternative methods of eliciting the kinds of dimensions or categories employed in viewing non-representational art. Assuming that the semantic confusion obtained in the earlier work was an inaccurate reflection of an underlying visual order, we decided that respondents could provide us with important clues to the relevant dimensions if we employed a task which allowed them to react in terms of visual rather than verbal criteria. As our focus had changed to eliciting rather than imposing dimensions, we needed a task which would allow the respondent to categorize the stimuli according to criteria that he himself deemed important. For this purpose we adapted a methodology employed by Gardner (1953) in his study of cognitive styles in categorizing behavior. Specifically, we presented a number of postcard-size reproductions of abstract paintings to several of our colleagues (seen individually) and asked them to "put together into groups the paintings which seem to you to belong together". Almost without exception our respondents did this rather quickly and with apparently little discomfort. Furthermore, there was considerable inter-respondent agreement in the sortings. Given the relative ease with which they completed the task, it was particularly impressive to observe their difficulty in describing the nature of their categories. Moreover, the descriptions which were offered often had an "after the fact" quality, giving the impression that the respondent was trying to rationalize his groupings. Again, we were struck by what should have been more immediately obvious -- the possibility that non-verbal factors were the critical ones mediating experience with the kinds of stimuli we had been employing, and that verbal mediation in this domain may play a secondary role.

After having collected several hundred postcard-size reproductions, we began a formal investigation designed to ascertain the primary dimensions employed in categorizing a set of abstract paintings. Determination of these dimensions would provide an operational basis for specifying the degree of similarity between paintings by comparing their pattern of loadings on the various dimensions. Such an index of similarity might then be exploited

as a standard against which to evaluate an individual respondent's judgments of similarity, thereby providing an empirical measure of what we regard as "esthetic sensitivity".

METHODS

Respondents:

One-hundred and seventy-five male undergraduates enrolled in the introductory psychology course at Ohio State University served as respondents in the present study, their participation counting toward fulfillment of a course requirement.

Procedure:

Upon the respondent's arrival the experimenter introduced himself, and stated that the present study constituted part of an investigation of factors involved in viewing abstract art. The experimenter explained that the investigation was currently focusing on "the ways in which people sort abstract paintings".

Pointing to a large, covered display board, he proceeded as follows:

> "On this board are a group of abstract paintings which I will ask you to sort.
>
> "First, I want you to know that there are no right or wrong ways to handle this task. Everyone does it in his own way. I want you to do it in the way that seems most natural, most logical, and most comfortable to you. The instructions are simply to put together into groups the paintings which seem to belong together. You may have as many or as few paintings in a group as you like, so long as the paintings in each group seem to belong together. If, after you have looked at all of the paintings, a few do not seem to go with any of the others, you may leave those paintings by themselves. Please sort all the paintings. It is a good idea to stand back for a moment or so and look at the board generally, before beginning sorting. As you sort the paintings be sure to avoid overlapping them completely so that all the paintings which constitute any particular group can be seen simultaneously. I am now going to leave the room. When you are finished let me know. I'll be in the hall or in Room 403."

The experimenter uncovered the board, exposing 40 paintings arranged on five narrow shelves, each shelf holding eight paintings. Two sets of 40 paintings were employed, approximately half the subjects working with each set. Placement of the paintings was randomly arranged for each respondent.

If the respondent asked for additional instructions, the experimenter replied approximately as follows:

> "Right now I would rather not say anything that has a chance of influencing how you sort the paintings. The important thing to remember is to put together into groups those paintings which somehow seem to belong together."

After the sorting task had been completed, the experimenter recorded the paintings included in each of the respondent's groupings. In cases where a respondent obviously had a large group with definite subdivisions, each subdivision was recorded as a separate group.

For each group assembled by the respondent, the experimenter asked and recorded the answers to the following questions:

a. What is it about these paintings that makes them belong together?

b. Is there anything else that made you feel these paintings belonged together?

c. (Asked only if the grouping consisted of more than two paintings) Which two paintings in this group are the ones you would say most typify the group -- which two paintings most express the essential quality of this group?

d. Which of the other groups do you regard as being most opposite to this one?

Finally the experimenter thanked the respondent for his cooperation and invited him to return at a later date if he wished to learn about the results of the study.

The entire procedure was usually completed in about 35 minutes.

In order to ascertain the reliability of the sorting procedure a number of the respondents were phoned and asked to return for an additional 20 minutes. The 32 Set I respondents and the 32 Set II

respondents obtained in this manner were asked to repeat the sorting task. These respondents were seen 11 to 17 days after their initial session. Instructions for the second session were as follows:

> "Today I am going to ask you to follow the same procedure as last time you were here. That is, I would like you to put together into groups the paintings which seem to you to belong together. You may have as many or as few paintings in a group as you like, so long as the paintings in each group seem to belong together. You should sort the paintings in the way that seems most natural, most logical, and most comfortable to you.
>
> "If it turns out when you are finished that you sorted the paintings pretty much the same way that you did the first time, that's fine. If the way you sorted the paintings turns out to be somewhat different, or very different from the way that you did it last time, that's fine too. The important thing is for you to sort the paintings in the way that seems most natural, most logical, and most comfortable to you. Put those paintings together into groups which seem to you to belong together.
>
> "Again, it is a good idea to stand back for a moment or so and look at the entire board before you begin sorting. As you sort the paintings avoid overlapping them so that you can simultaneously see all the paintings which constitute any particular group."

After having completed the sorting task, the respondent was asked to estimate the similarity of his groupings to that made at the previous session by placing a check in the appropriate space on the scale shown below:

Extremely Similar							Extremely Dissimilar

Next, the respondent was asked to indicate the extent to which he had tried to make his second sorting similar to or dissimilar from his previous one.

Tried very hard for similarity to previous sort.			Made no effort to make sort similar to or dissimilar from previous sort.				Tried very hard for dissimilarity from previous sort.

The experimenter again thanked the respondent for his cooperation, and reminded him to return at the end of the quarter if he was interested in learning more about the study.

Paintings:

The reproductions contained in the first set of 40 paintings consisted of every fifth reproduction in a collection of 200 non-representational works arranged alphabetically by artist's last name. This procedure insured a wide representation of painting styles, and was consistent with the admittedly tenuous assumption that the frequency with which artists were represented in our collection roughly paralleled the general visibility of their paintings in the "real world". A listing of the paintings in both sets (hereafter referred to as Set I and Set II) appears in the Appendix (Tables I and II).

RESULTS

Test-Retest Reliability of the Sorting Procedure:

A 40 x 40 matrix, with entries of 1 or 0 indicating whether or not any two paintings had been grouped together was constructed for each of the subject's sortings. The two matrices available for each of the subjects who had been recalled for the second sort provided the data for an estimate of the test-retest reliability of the procedure. The reliability index was simply the percentage of paintings paired on the first sort which were also paired on the second.

The mean reliability for subjects working with Sets I and II was .37 and .40, respectively. The relatively low reliability reflected in these figures might well be attributable to the "demand characteristics" of the second sorting session. Given that students are generally suspicious about psychology experiments, those respondents invited to return for the second session may have taken that invitation to mean that their first performance had in some way been less than adequate. Respondents making such an interpretation would certainly have been inclined to group the paintings differently when given a second opportunity.

In estimating the similarity between their first and second groupings on a 7-point scale ranging from "Extremely similar"(1) to "Extremely dissimilar"(7), Set I respondents gave a mean rating of 3.06 (S.D. = 1.45) and Set II respondents gave a mean rating of 2.77 (S.D. = 1.54). Responses to another 7-point scale ranging from "Tried very hard for similarity to previous sort"(1) to "Tried very hard for dissimilarity from previous sort"(7), Set I and Set II

respondents gave mean ratings of 3.19 (S.D. = 1.23) and 3.09 (S.D. = .99), respectively. At the very least, these data suggest that, in general, respondents did not exert an extreme effort to make their two sortings in a highly similar manner.

A cumulative matrix was constructed for each set of paintings by summing the cell entries of all individual respondent matricies generated on the first sorting. These cumulative matricies, shown in Tables 1 and 2 reflect a substantial degree of intersubject agreement in the groupings, thus providing indirect evidence for the reliability of the sorting task.[1,2]

Multidimensional Scaling Analyses:

In order to extract the dimensions underlying subjects' groupings, and to specify each painting's loading on each of the dimensions, multidimensional scaling (MDS) analyses were applied to the cumulative matrices described in the last section.[3]

Two MDS procedures, one developed by Kruskal (1968) and the other by Young and Torgerson (Young, 1968)[4] were employed. The latter procedure involves a form of principal components analysis prior to iteration.

---

[1]As subjects' verbal characterizations of the criteria according to which they grouped the paintings was of secondary concern in the present study, data from the post-experimental inquiry will be analyzed separately and reported elsewhere.

[2]After about half the subjects were run, we discovered that Set I inadvertently included one painting, which although heavily impressionistic, was representational (No. 27). There is no evidence that this affected our findings in any significant way.

[3]A similar procedure had been employed by Skager, Schultz, and Klein (1966). In their study, designed to elicit dimensions of painting style, the stimuli were restricted to students' artistic representations of a single subject matter, a skyline view.

[4]This program is based on Young, F. W. and Torgerson, W. S. TORSCA, A FORTRAN IV program for Shephard-Kruskal multidimensional scaling analysis. Behavioral Science, 1967, 12, 498; and on Young, F. W. TORSCA-9 a FORTRAN IV program for nonmetric multidimensional scaling. Behavioral Science, 1968.

Table 1. Cumulative Matrix for Set I (N=87)

Painting No.	Painting No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	*	20																																							
2	*	9	2																																						
3	*	5	9	1																																					
4	*	10	16	12	1																																				
5	*	11	20	6	43	5																																			
6	*	6	7	5	1	4	4																																		
7	*	0	0	1	1	0	2	12																																	
8	*	7	30	7	8	6	0	1	2																																
9	*	15	12	23	10	6	11	1	9	5																															
10	*	6	5	4	12	11	0	15	2	2	18																														
11	*	1	2	0	0	0	5	26	5	1	3	0																													
12	*	2	14	8	3	2	3	4	44	12	2	22	0																												
13	*	1	1	1	1	1	4	33	3	1	2	66	18	2																											
14	*	46	11	3	6	5	3	0	1	1	9	1	3	1	4																										
15	*	3	2	0	3	2	2	5	0	0	5	0	0	0	1	9																									
16	*	4	8	63	15	9	1	0	12	18	7	1	12	2	4	0	1																								
17	*	22	3	6	3	7	2	0	0	4	10	1	0	0	42	2	5	10																							
18	*	9	18	12	35	29	0	0	13	9	22	0	4	2	14	0	16	10	6																						
19	*	1	9	3	1	4	9	6	8	4	3	11	7	11	3	1	1	2	4	20																					
20	*	17	0	2	4	7	3	0	1	4	5	2	0	0	16	10	2	29	1	2	24																				
21	*	1	1	0	0	1	3	6	0	1	2	3	1	1	1	21	0	3	1	5	6	18																			
22	*	0	1	1	1	0	2	7	0	0	3	2	0	1	0	12	0	1	0	2	1	17	23																		
23	*	3	6	0	5	6	7	1	3	5	3	2	2	1	3	7	2	2	0	5	11	6	9	27																	
24	*	5	16	13	24	24	6	1	12	5	20	0	7	3	6	5	19	4	45	9	2	1	0	0	5																
25	*	3	3	2	5	2	17	44	2	7	16	20	3	23	0	2	0	1	0	8	0	2	4	2	0	4														
26	*	4	29	12	5	9	2	3	46	10	6	6	29	2	5	0	16	3	13	11	3	2	0	2	15	1	5													
27	*	6	3	2	4	2	8	2	7	27	0	6	13	5	10	0	1	3	0	5	5	2	0	5	1	12	7	11												
28	*	3	4	2	1	2	27	2	0	2	4	0	0	0	1	23	0	0	0	5	8	16	8	10	0	7	0	3	2											
29	*	1	0	1	2	1	3	6	0	1	3	0	0	0	1	44	0	2	0	2	7	16	16	3	1	5	0	9	16	15										
30	*	8	20	2	20	27	9	1	6	1	9	0	0	0	4	8	1	1	12	5	5	1	2	10	7	2	1	2	20	4	0									
31	*	2	4	1	8	7	2	5	2	1	7	1	1	1	2	4	0	4	4	4	2	16	32	6	5	4	3	0	8	7	8	18								
32	*	4	8	3	3	6	9	1	1	7	5	2	2	1	3	3	0	6	4	22	7	2	2	18	3	4	5	3	8	2	9	8	16							
33	*	2	0	1	0	1	8	10	0	0	1	7	2	6	0	11	0	0	0	7	1	37	16	10	0	7	1	2	18	12	2	10	2	13						
34	*	3	1	1	5	3	6	3	2	15	3	0	3	0	2	10	2	1	1	4	5	8	4	6	3	10	1	42	9	24	5	2	3	13	11					
35	*	1	0	1	1	0	2	10	0	0	4	0	0	0	0	38	0	0	0	1	4	23	29	4	0	4	0	0	16	37	3	17	2	21	9	16				
36	*	7	11	49	12	11	3	0	9	8	11	1	12	2	10	0	54	14	18	2	3	0	0	1	27	0	15	1	0	0	3	1	1	0	0	0	4			
37	*	3	7	3	5	8	15	2	0	5	10	1	0	1	1	9	1	2	3	7	5	7	6	9	1	3	2	1	37	8	29	18	10	6	5	8	0	3		
38	*	5	10	3	15	15	12	1	0	1	9	0	0	0	0	21	1	3	5	7	5	5	2	12	5	2	1	0	34	11	47	8	8	5	6	7	2	31	0	
39	*	7	12	49	20	14	5	0	6	26	9	0	5	1	4	0	39	3	16	2	2	0	0	1	14	3	13	4	1	0	3	0	4	1	4	0	23	4	7	5	
40	*	3	13	8	2	3	15	7	21	4	2	23	39	25	3	1	7	2	4	12	0	1	1	2	5	14	11	8	2	0	0	1	1	7	1	1	5	2	0	4	8

Table 2. Cumulative Matrix for Set II (N=88)

Painting No.

Painting No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1 *	14																																							
2 *	0	1																																						
3 *	11	2	33																																					
4 *	1	47	3	0																																				
5 *	4	6	3	6	13																																			
6 *	19	0	14	1	5	6																																		
7 *	1	13	9	6	9	1	8																																	
8 *	1	12	1	19	12	4	3	0																																
9 *	8	5	4	5	1	2	3	7	13																															
10 *	0	47	3	21	18	1	30	3	1	3																														
11 *	16	2	1	5	7	13	1	14	13	0	10																													
12 *	0	52	1	69	6	0	7	12	4	23	1	1																												
13 *	0	25	1	43	6	0	7	7	1	16	0	50	7																											
14 *	20	1	5	0	5	13	6	1	23	2	6	1	0	7																										
15 *	7	6	10	4	6	4	4	1	16	2	10	4	1	4	24																									
16 *	0	6	1	12	9	4	1	55	5	2	12	10	4	1	0	4																								
17 *	0	0	3	0	4	2	1	0	2	2	0	0	2	1	4	0	12																							
18 *	47	1	6	1	7	15	4	0	9	0	15	0	1	15	7	1	2	2																						
19 *	0	11	0	18	6	1	4	2	0	8	0	22	41	0	1	1	33	0	6																					
20 *	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	21	1	8	8																				
21 *	0	2	1	0	1	1	2	0	0	3	0	1	6	0	1	1	9	0	6	24	7																			
22 *	2	1	2	5	12	11	1	30	11	0	24	1	1	6	2	48	0	5	0	0	1	2																		
23 *	12	3	9	0	2	9	21	1	2	7	1	0	0	11	6	0	8	17	0	4	4	1	7																	
24 *	15	0	8	1	2	14	2	2	25	1	5	0	0	43	1	0	8	11	1	1	1	4	9	10																
25 *	0	0	1	0	8	2	0	1	0	6	0	0	1	0	1	2	26	2	9	29	16	1	7	4	9															
26 *	16	0	5	1	10	9	4	1	10	2	22	0	0	16	14	1	1	28	0	0	0	6	6	9	0	5														
27 *	13	1	15	3	2	24	3	3	7	2	7	1	0	15	4	3	3	11	0	0	0	9	12	12	0	9	13													
28 *	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	19	1	7	68	36	0	4	1	29	0	0	4												
29 *	5	2	4	2	10	5	1	1	2	6	1	2	3	2	7	0	18	9	13	12	5	2	11	6	38	4	1	12	11											
30 *	7	0	20	1	8	5	7	1	6	7	4	0	0	3	18	1	3	10	0	2	0	2	4	3	4	11	8	2	5	9										
31 *	3	0	3	0	28	30	4	11	4	1	16	0	0	3	2	12	1	4	0	0	1	36	3	4	2	5	10	1	3	4	3									
32 *	0	2	0	1	0	0	1	0	0	2	0	2	8	0	0	1	9	0	7	30	72	0	3	0	17	0	0	40	4	0	1	4								
33 *	5	9	8	2	12	10	16	1	4	9	3	3	1	3	7	1	3	8	3	1	5	3	22	3	3	6	9	0	3	13	8	2	15							
34 *	12	1	12	1	10	7	4	4	8	4	9	0	0	7	22	2	3	16	0	0	0	3	6	4	0	24	7	0	1	46	3	0	14	3						
35 *	0	1	1	0	2	1	2	0	0	4	0	0	1	0	2	0	19	2	8	39	16	0	20	1	40	0	0	37	25	4	2	15	4	1	1					
36 *	1	1	0	0	2	1	3	0	0	4	0	0	1	0	1	0	19	2	9	37	11	0	23	0	34	1	0	33	24	5	2	14	6	1	12	6				
37 *	28	0	2	0	5	13	2	4	27	1	28	0	1	15	10	8	2	28	1	0	0	17	2	13	0	21	5	0	1	6	14	0	4	12	1	0	2			
38 *	11	0	3	0	15	21	6	3	2	4	12	0	0	6	10	4	3	19	1	0	0	7	5	2	5	19	8	0	7	11	23	0	16	14	1	2	19	7		
39 *	5	4	5	6	0	11	19	0	11	4	4	5	2	24	4	1	5	5	3	0	0	3	9	21	1	16	10	0	5	3	4	0	7	6	0	0	14	12	5	
40 *	2	13	2	24	9	5	4	74	6	4	11	13	6	1	2	49	0	1	2	0	0	27	1	2	0	1	5	0	1	1	10	0	0	3	0	0	3	2	0	4

The computer program for the Kruskal procedures was set to yield configurational solutions based on 1 to 9 dimensions for both the Set I and the Set II data; the program for the Young-Torgerson procedure was set to yield solutions based on 1 to 10 dimensions.

A "stress value" computed for each solution provided an index of how well that solution fit the data; the lower the stress, the better the fit. Although the Kruskal and Young-Torgerson formulas for computing stress are somewhat different, their results may be compared in terms of the values shown in Table 3.

Figure 1 reveals that for the Kruskal procedure, the optimal fit to the data of Sets I and II is provided by a six-dimensional configuration; progressive decreases in the number of dimensions yielding progressively poorer results, progressive increases yielding no improvement.

Figure 2 reveals that the Young-Torgerson procedure yields progressively better results for the data of Sets I and II as the number of dimensions is increased. However, beyond six or seven dimensions the gain, in lowered stress values, is insubstantial. As the Kruskal procedure gave somewhat better results in terms of stress, and provided more clear-cut evidence concerning optimal configuration than the Young-Torgerson procedure, the Kruskal six-dimension configurations were used as the primary basis for the next stages of our work.

Identification of the Dimensions:

Table 4, based on the Set I data, presents the loadings of each painting on each of the dimensions. Table 5 presents the loadings for Set II. Inspection of the paintings with the largest positive and largest negative loadings on each of the dimensions, indicated considerable correspondence between those extracted from the Set I matrix and those extracted from the Set II matrix. That is, each of the six Set I dimensions appeared to have a counterpart in Set II. This was clearer for some dimensions than for others.

The following represents an initial, provisional attempt to describe the opposite poles of the various dimensions in verbal terms, on the basis of paintings with the largest positive and negative loadings on each dimension. The descriptions, although based on results from Set I data, are in large measure, applicable to results from Set II. The numbers used to identify the dimensions (I-VI) correspond to the numbers identifying the Set I dimensions in Table 4.

Table 3

Equivalence Table for Comparing Stress Values Computed by Kruskal and Young-Torgerson Formulas.[a]

Evaluation of Goodness-of fit	Kruskal	Young-Torgerson
Poor	40%	20%
Fair	20%	10%
Good	10%	5%
Excellent	5%	2-1/2%
Perfect	0%	0%

[a]After Kruskal, 1968.

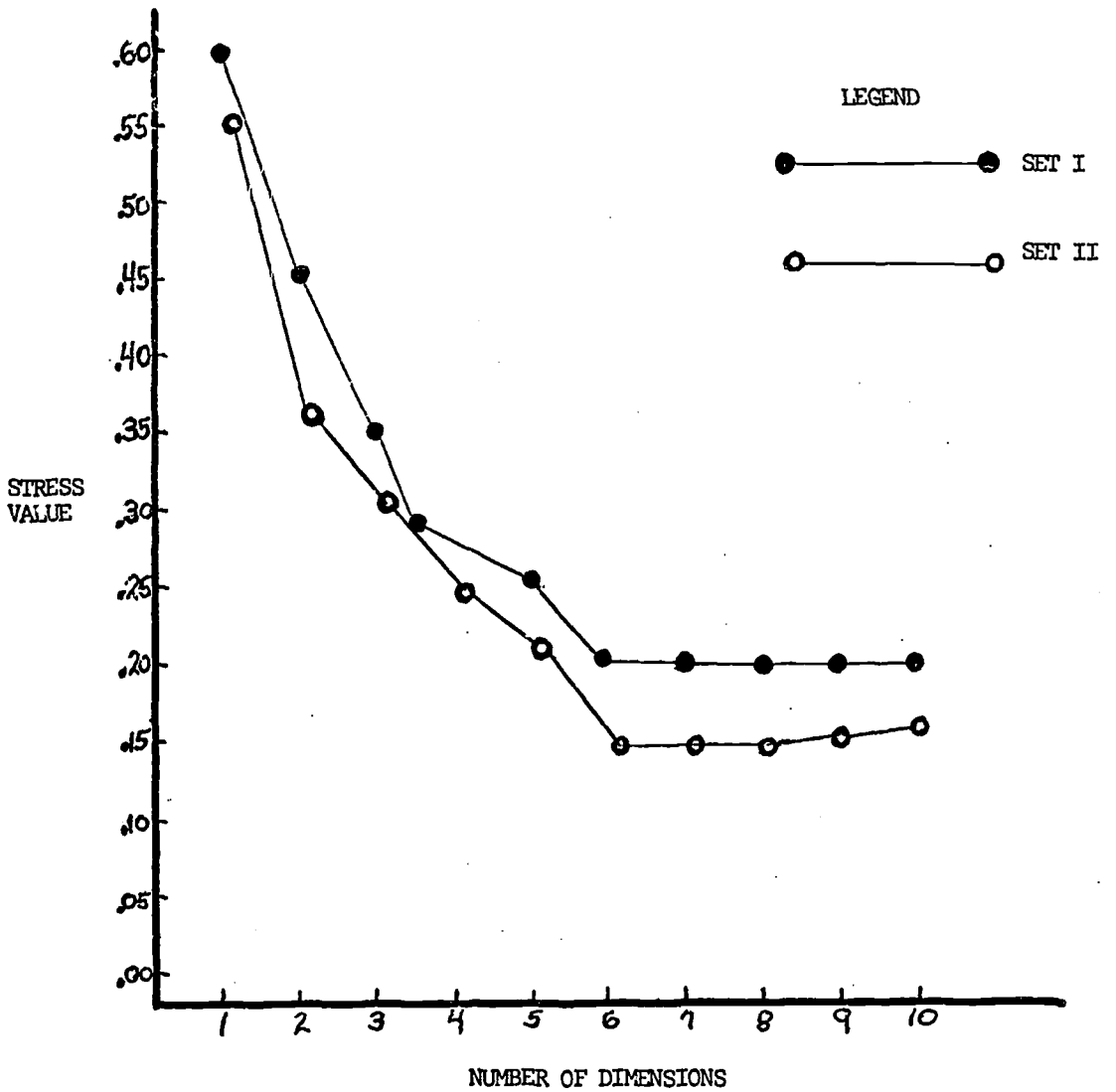

FIGURE 1. Stress value of Kruskal M.D.S. solutions as a function of number of dimensions fitted to the data of Set I and Set II.

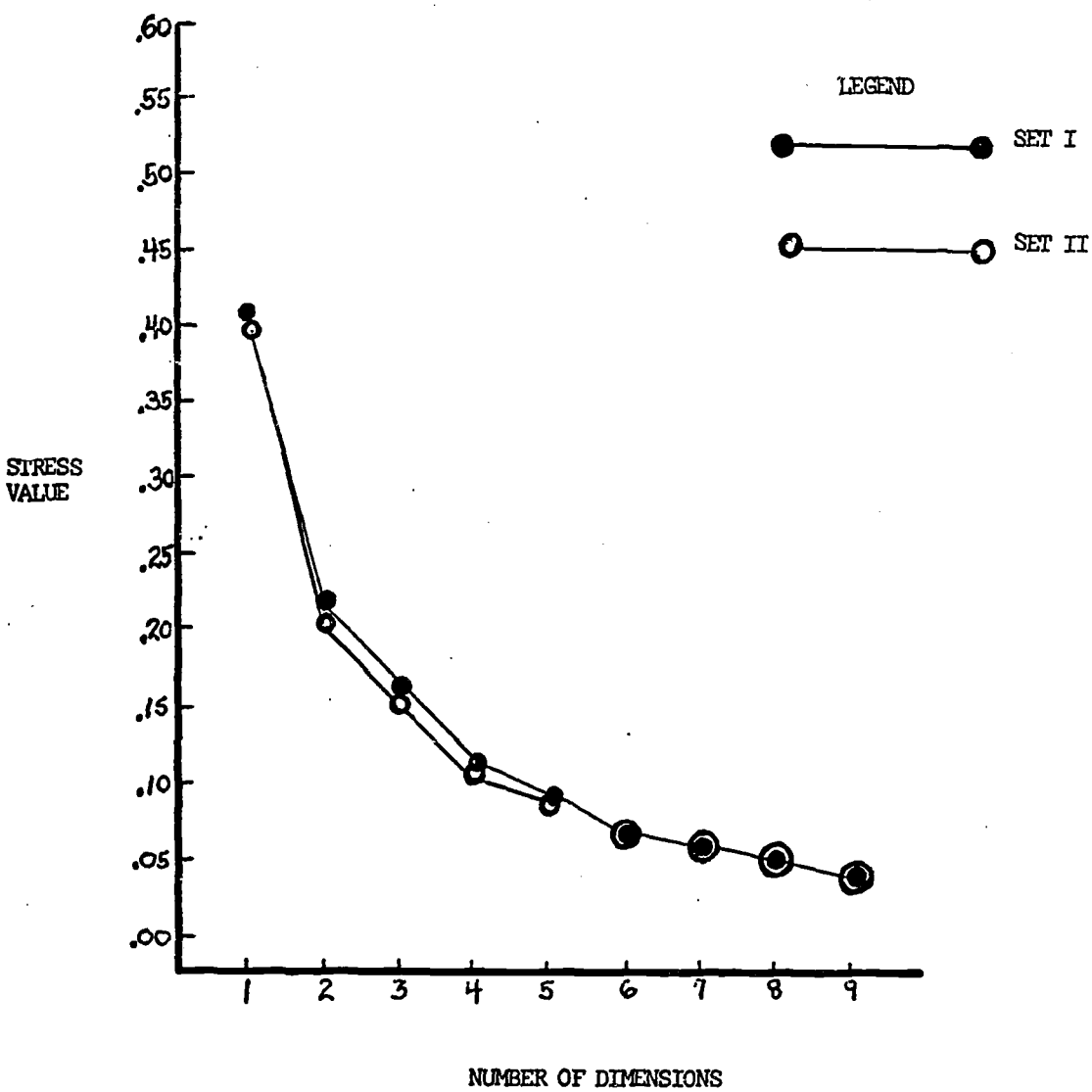

FIGURE 2. Stress value of Young-Torgerson M.D.S. solutions as a function of the number of dimensions fitted to the data of Set I and Set II.

Table 4

Loadings of Set I Paintings in the

Kruskal Six-Dimension Solution

Painting	Dimension 1	2	3	4	5	6
1	.183	-.751	-.237	.322	-.177	.176
2	-.119	.162	.029	.194	.017	.754
3	-.592	-.008	-.420	-.080	-.562	.288
4	-.375	.003	-.246	.683	-.012	.205
5	-.085	.070	-.527	.469	.145	.453
6	-.406	-.187	.117	-.726	.283	.011
7	.168	.523	.357	-.296	-.334	-.753
8	-.003	.133	.392	.243	-.471	.806
9	-.467	-.575	.097	-.147	-.325	.356
10	.087	.293	-.559	.246	-.263	-.365
11	.376	.315	.620	-.604	-.606	-.194
12	-.027	.137	.543	-.125	-.772	.476
13	.192	.494	.532	-.497	-.695	-.267
14	.461	-.672	-.214	.298	-.407	.226
15	.005	-.144	-.028	.338	.721	-.759
16	-.520	-.077	-.346	.184	-.792	.514
17	.509	-.509	-.651	.083	-.374	-.100
18	-.004	.197	-.471	.601	-.339	.408
19	.242	.390	.147	-.605	.050	.342
20	.458	-.745	-.390	-.005	.198	-.241
21	.613	-.004	.485	.094	.546	-.556
22	.553	.565	.140	.002	.640	-.716
23	.351	-.313	.197	-.180	.719	.305
24	-.082	.379	-.296	.609	-.382	.273
25	-.257	.179	.301	-.535	-.258	-.581
26	.132	.128	.149	.022	-.510	.784
27	-.166	-.664	.672	-.129	-.255	-.023
28	-.190	-.054	-.008	-.304	.840	-.349
29	-.076	-.239	.197	.151	.569	-.884
30	-.203	.058	-.351	.291	.701	.272
31	.526	.564	-.138	.203	.471	-.215
32	.348	-.085	-.377	-.587	.371	.351
33	.185	.245	.684	-.247	.535	-.467
34	-.351	-.497	.516	.144	.250	-.417
35	.196	.217	.117	.079	.665	-.948
36	-.258	-.035	-.551	.150	-.783	.445
37	-.174	.257	-.372	-.240	.713	-.106
38	-.334	.019	-.354	.121	.777	-.037
39	-.732	-.171	-.351	.055	-.389	.326
40	-.165	.401	.594	-.272	-.504	.208

Table 5

Loadings of Set II Paintings in the

Kruskal Six-Dimension Solution

Painting	Dimension 1	2	3	4	5	6
1	.289	-.909	.147	.396	.155	.058
2	-.590	.593	.035	.092	-.497	-.252
3	.148	.053	.252	.859	.167	.131
4	-.458	.472	-.177	.109	-.500	-.514
5	-.242	-.037	-.446	-.248	-.324	.378
6	.663	-.428	.111	.093	-.158	.251
7	-.457	.224	.661	.020	-.331	.155
8	.090	.190	-.582	.169	-.753	-.321
9	-.120	-.541	-.009	.414	-.190	-.703
10	-.664	.505	.148	-.136	-.284	.158
11	.081	-.740	-.402	.261	-.594	-.064
12	-.522	.631	-.119	-.056	-.476	-.505
13	-.394	.789	-.130	-.237	-.193	-.520
14	.180	-.686	.569	.188	-.195	-.365
15	-.568	-.365	-.255	.421	.297	-.056
16	.283	.127	-.695	-.001	-.721	-.284
17	.146	.209	.135	-.337	.786	-.292
18	.096	-.795	.096	.073	.271	.155
19	-.301	.606	-.104	-.500	.249	-.493
20	.193	.686	.020	-.368	1.083	.186
21	.415	.981	-.053	-.206	.419	.218
22	.450	-.278	-.526	-.011	-.635	-.195
23	.087	-.032	.682	-.027	.301	.336
24	.398	-.403	.440	.103	.156	-.555
25	.185	.303	-.251	-.590	.633	.222
26	-.279	-.902	.164	.157	-.221	.160
27	.546	-.208	.381	.525	-.302	.066
28	.289	.723	-.084	-.333	.950	.166
29	-.133	-.059	-.156	-.493	.638	.045
30	-.256	-.171	-.151	.597	.297	.470
31	.510	-.220	-.329	-.231	-.481	.347
32	.300	1.099	-.058	-.347	.514	.165
33	-.132	.057	.326	.106	-.194	.682
34	-.340	-.524	-.050	.601	-.026	.376
35	.083	.398	.201	-.447	.778	.373
36	-.019	.329	.234	-.490	.778	.440
37	.114	-.872	-.156	-.029	-.192	-.249
38	.005	-.626	-.058	-.247	-.209	.492
39	-.172	-.391	.718	-.120	-.262	-.313
40	.097	.212	-.529	.267	-.735	-.351

Dimension I

Positive loadings: Large fields of the same color which seem to extend beyond the frame, there is some geometric organization in evidence, i.e., shapes are aligned with the edges of the painting. Painting is relatively flat, with little or no overlap, and the texture is quite smooth.
(examples: 21, 22)

Negative loadings: Many colors and shapes are loosely controlled. Color is applied over color. The movement is sweeping and circular. Control is achieved by the use of lines that define the direction of the movement. The shapes are largely contained within the frame with some slight sense of movement beyond the frame.
(examples: 39, 3)

Dimension II

Positive loadings: Relatively similar to the positive pole of Dimension I. Texture creates a uniform surface. The composition seems to continue beyond the frame.
(examples: 22, 31)

Negative loadings: Many discrete specific shapes tending to be organized on a uniform color field. Shapes have precise, clear edges. Most elements of composition are contained within the frame, though these elements seem to rest on a space that continues beyond the frame.
(examples: 1, 20)

Dimension III

Positive loadings: Relatively uniform in neutral colors. Rectilinear patterns and textures are created by use of lines, and the overall patterns extend beyond the edge. Patterns are aligned with the vertical and horizontal edges.
(examples: 33, 27)

Negative loadings: A dominant shape is repeated throughout. Softly curved or circular forms are prominent. Saturated hues, with some blending are present and these are placed on a light, nearly white field. Shapes are aligned with the edges.
(examples: 17, 10)

Dimension IV

Positive loadings: Saturated color areas and strong value contrasts are present. There is an interlocking of shapes. Each

shape has discrete color. Crowded composition with each shape bounded by others.
(examples: 4, 24).

Negative loadings: Grey, tan or brownish earth colors predominate. Lines create shapes and some patterns and textures.
(examples: 6, 19)

Dimension V

Positive loadings: Controlled rectilinear organization with interlocking shapes that are aligned with the vertical or horizontal edges. Shapes are locked in place, and are stationary. When color is present it is located in defined areas.
(examples: 28, 38)

Negative loadings: Relatively splashy, streaked or smeared forms showing much movement. When color is present it runs together rather than remaining in discrete, bounded forms. Unlike the negative end of Dimension I, it lacks overall control that was achieved by the use of line.
(examples: 16, 36)

Dimension VI

Positive loadings: Large areas of muted, dark colors in diffused shapes. Heavy painted textures are present. Brush strokes are evident. Composition seems to extend beyond the frame.
(examples: 8, 26)

Negative loadings: Light, crisp, mechanically precise geometric shapes. Solid colors are applied with no evidence of brush strokes. Composition contained within its own frame.
(examples: 35, 29)

It needs to be emphasized that these descriptions represent a provisional rather than a definitive characterization of the dimensions underlying subjects' sorts. The overlap among the dimensions within each Set and discrepancies between the two Sets indicates the need for further clarification of the dimensions which subjects employed in their categorization of the paintings. We are currently planning a study designed to determine whether other of the obtained MDS solutions, although less than optimal in terms of stress, yield "purer" dimensions. Tables IV-VII and VIII-XII in the Appendix give the Kruskal solutions based on 1-5 dimensions for the Set I data and the Set II data, respectively.

As noted the six-dimension solutions, since they yielded the best fit to the present data, were employed in the next phase of our work, the development of a methodology for assessing esthetic sensitivity.

The Development of a Measure of Esthetic Sensitivity:

We had anticipated that following the empirical specification of dimensions by MDS, we would construct a measure of esthetic sensitivity based on subjects' appreciation of the various dimensions considered singly. However, as may be seen from Tables 4 and 5, most of the paintings in each of the two Sets had high loadings (positive and/or negative) on more than one dimension. We therefore decided to construct a measure which would explicitly recognize the multidimensional nature of the paintings. This measure, currently being developed exploits the fact that the degree of similarity between any two paintings in a Set may be indexed empirically by comparing the distance between the pattern of their loadings on the six dimensions. The distance between any two paintings, P_{1j} and P_{2j}, may be computed according to the following formula:

$$d\left(P_1P_2\right) = \sqrt{\sum_{j=1}^{6}\left[P_{1j}-P_{2j}\right]^2}$$

where the overall distance between two paintings is given by the square root of the sum of the squared distance between them on each of the six dimensions. In effect, these are distances in a six-dimensional space.

The inter-painting distances, for Sets I and II are shown in Tables XIII and XIV of the Appendix. Our measure of sensitivity will be based on the degree to which an individual's assessment of the similarity among paintings approximates the distances shown in the latter tables.

At present we are beginning a study in which subjects are required to rank order a series of paintings in terms of their similarity to a target painting. Each subject rank orders several such series. To the extent that the mean rank orders obtained in this manner approximate the MDS distances, we may be confident in using the latter as the standard against which to evaluate individual subjects. Discrepancies of the mean rank orderings from the MDS distances would, of course, necessitate a modification of the standard in line with the orderings obtained from subjects. Thus far, informal pre-testing with several sample series has tended to support the MDS results.

CONCLUSIONS AND COMMENTS ON THE PRESENT APPROACH

The research program reported here was designed to develop a procedure for assessing sensitivity to dimensional components of non-representational art. The program is based on the assumption that non-representational art can be described in terms of empirically specifiable dimensions, and that an individual's sensitivity to, or his appreciation of these dimensions is importantly implicated in his esthetic reactions. Multidimensional scaling analyses were employed to yield a provisional characterization of the dimensions employed by subjects in grouping paintings contained in two sets of 40 abstract works. The "distances" among paintings, expressed in terms of their loadings on various dimensions, provides a standard against which to assess an individual subject's estimates of their similarity.

As far as is known to the authors, the present investigation is the first empirical attempt to identify the dimensions of abstract art through the use of non-verbal procedures. In a very important sense, the study reported here, as well as the continuing work generated by its findings, takes its impetus from the conviction that the "understanding" of non-representational art may be increased by its description in terms intrinsic to the medium.

Even the most casual inspection of the paintings defined as similar in terms of the distance matrices strongly suggests that the subjects based their initial groupings on the visual feeling-tone qualities of the paintings. This impression is supported by the fact that subjects, although they often sorted the paintings quickly and surely, giving little evidence of conscious verbal mediation, frequently found it difficult to articulate the basis of their groupings.

From the results of our work thus far we are encouraged that the basic visual dimensions of non-representational art can be specified empirically. We regard such a specification as a means of approaching the issues of visual meaning -- in a way analogous to Osgood's (1957) work in the verbal domain.

Whether our measure, based on subject's sensitivity to these meanings, reflects "esthetic sensitivity" is still an open question -- a question we intend to approach by comparing the scores of respondents with varying levels of training in art, and by exploring the relationship between scores and preference for painting of various types. Work on these problems is currently underway.

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APPENDIX

Table I

Titles and Artists of Paintings in Set I

1. Max Ackermann
   IXth Symphony (1953)

2. G. Ajmone
   Frutta e Foglie (1954)

3. Karel Appel
   Amorous Dance (1920)

4. G. Benner
   The Farm (1954)

5. Roger Bissière
   Hommage to Fra Angelico (1949)

6. Georges Braque
   Viloncello (1911)

7. Pol Bury
   3069 White Dots on an Oval Ground (1966)

8. Massimo Cavalli
   Immagine (1963)

9. Corneille
   The Great Earth (1922)

10. Robert Delaunay
    Disks (1913)

11. Jean Dubuffet
    The Desert Blazes (1953)

12. Gianfranco Fasce
    Citta (1957)

13. Klaus Jorgen-Fischer
    Tufts of Strokes (1962)

14. Gorky
    The Orators (1947)

15. Auguste Herbin
    Vie No. 1 (1950)

16. Frieda Hunziker
    Ardeath Vita (1908)

Table I (Continued)

17. Wassily Kandinsky
Composition

18. Ida Kerkovius
Maid in the Flower (1958)

19. Paul Klee
Fragments of Still Life (1925)

20. Fernand Leger
Morceaux de Bois et Nuages (1952)

21. Osvaldo Licini
Scherzo (1932)

22. Kasimir Malevitch
Large White Cross on Grey (1916/18)

23. A. Manessier
What was Lost? (1952)

24. Johannes May
Sonorous Light

25. Piet Mondrian
Study of a Tree (1913)

26. Ennio Morlotti
Paesaggio dell' Adda (1953)

27. Rolf Nesch
Trinity Church

28. Ben Nicholson
Vertical Seconds (1953)

29. Eduardo Paolozzi
Universal Electronic Vacuum (1967)

30. Serge Poliakoff
Abstract Composition (1954)

31. Mark Rothko
Number 10 (1950), Oil

32. William Scott
Ochre Painting (1958)

33. Jesus Raphael Soto
Cardenal (1965)

Table I (Continued).

34. Yurg Spiller
Citta di Notte (1947)

35. Frank Stella
Fez (1964), Oil

36. Boris Umestev
Recollection #4

37. J. Villon
Le Pigeonnier Normand (1953)

38. Jacques Villon
Prometheus Plays with the Fire (1957)

39. Peppino Mieternik
Colour Cumulation (1957)

40. Wols
Composizione (1947)

Table II

Titles and Artists of Paintings in Set II

1. Max Ackermann
   Abstracts Composition (1951)

2. Giuseppe Ajmone
   Riflessi (1958)

3. Willi Baumeister
   Han-aru (1955)

4. M. Bionda
   Immagine Orizzontale (1958)

5. Roger Bissière
   Composition

6. Heinz Broc
   Sitting Person

7. Corrado Cagli
   Compositions (1950)

8. A. Chighine
   Tramonto sul mare (1957)

9. Roberto Crippa
   Aurora Borealis (1952)

10. Robert Delaunay
    Fenetres Multipliees (1912)

11. Duncan
    Composite

12. Gianfranco Fasce
    Mare (1959)

13. Klaus Jurgen-Fischer
    Graduated Violet

14. Arshile Gorky
    Agony (1947)

15. Ivon Hitchens
    Woodland, Vertical and Horizontal (1958)

Table II (Continued)

16. Jasper Johns
Zero Through Nine (1961)

17. Wassily Kandinsky
Heavy Circles (1927)

18. Ida Kerkovius
Composition with Blue

19. Yves Klein
Resonance (1960/61)

20. Thomas Lenk
Pile Up - Symbol in the Plane (1968)

21. Morris Louis
Unfolding Light (1961)

22. Alfred Manessier
Alleuia Des Champs (1955)

23. Louis Marcoussis
Rain No. 1 (1927)

24. Joan Miró
Femme et oiseau dans la nuit (1945)

25. P. Mondriaan
Compositie in bleu (1917)

26. J. Nanninga
Compositie

27. Rolf Nesch
Trees (1935)

28. Kenneth Noland
Transwest (1965)

29. Victor Pasmore
Square Motif, Blue and Gold: The Eclipse (1950)

30. Serge Poliakoff
Composition in Black, Grey, Red, and Yellow (1957)

31. Max Rupp
Blown-up Lattice (1961)

32. Peter Sedgley
Yellow Attenuation (1965)

Table II (Continued)

33. Pierre Soulages
Composition (1950)

34. Nicolas De Stael
Footballers (1952)

35. Joh Cecil Stephenson
Painting (1937)

36. Victor Vasarely
Nives 11 (1949/58)

37. Theodor Werner
Carnival in Nice (1952)

38. Fritz Winter
Project (1956)

39. Fritz Winter
Black before Red (1953)

40. Wols
Composizione (1949)

Table III

Loadings of Set I Paintings in the

Kruskal One-Dimension Solution

Painting	Dimension 1
1	- .449
2	- .619
3	-1.009
4	- .522
5	- .532
6	.302
7	1.135
8	-1.373
9	- .894
10	- .195
11	.015
12	-1.277
13	- .827
14	- .679
15	1.501
16	-1.638
17	- .331
18	-1.216
19	.050
20	.483
21	1.358
22	1.952
23	.565
24	-1.059
25	.216
26	-1.037
27	- .154
28	1.193
29	1.553
30	.371
31	.866
32	.280
33	1.236
34	.722
35	2.085
36	-1.468
37	.645
38	.612
39	-1.145
40	- .714

Table IV

Loadings of Set I Paintings in the

Kruskal Two-Dimension Solution

Painting	Dimension 1	2
1	- .241	- .781
2	- .554	- .078
3	- .975	- .306
4	- .437	- .452
5	- .424	- .444
6	.230	.443
7	.460	1.201
8	-1.160	.110
9	- .694	- .346
10	- .112	- .131
11	- .333	1.169
12	-1.004	.458
13	- .489	1.204
14	- .465	- .995
15	1.316	- .055
16	-1.315	- .448
17	- .216	-1.118
18	- .905	- .566
19	- .180	.556
20	.535	- .836
21	1.205	.394
22	1.469	.666
23	.662	- .192
24	- .841	- .262
25	.160	.828
26	- .976	.104
27	.079	- .657
28	.990	.119
29	1.356	.002
30	.311	- .293
31	.710	.310
32	.236	- .049
33	.943	.733
34	.792	- .341
35	1.533	.392
36	-1.219	- .506
37	.605	.071
38	.550	- .143
39	- .942	- .422
40	- .662	.661

Table V

Loadings of Set I Paintings in the

Kruskal Three-Dimension Solution

Painting	Dimension 1	2	3
1	- .181	- .739	- .402
2	- .456	.120	- .328
3	- .855	- .236	- .417
4	- .238	.035	- .711
5	- .167	- .028	- .782
6	.110	- .307	.553
7	.185	.776	.973
8	-1.059	.179	- .044
9	- .634	- .553	.013
10	.018	.450	- .506
11	- .498	.486	1.009
12	- .997	.128	.380
13	- .635	.573	.988
14	- .336	- .879	- .437
15	1.237	.034	.048
16	-1.117	- .215	- .574
17	- .012	- .810	- .772
18	- .594	.098	- .820
19	- .211	.454	.326
20	.544	- .809	- .317
21	1.015	.216	.586
22	1.186	.646	.536
23	.662	- .398	.036
24	- .562	.258	- .707
25	- .004	.294	.826
26	- .927	.163	- .101
27	- .306	- .607	.630
28	.914	.066	.142
29	1.154	- .080	.451
30	.438	.138	- .596
31	.623	.646	- .153
32	.392	- .313	- .255
33	.716	.319	.804
34	.491	- .481	.531
35	1.280	.351	.406
36	-1.007	- .234	- .670
37	.662	.229	- .194
38	.657	.128	- .483
39	- .757	- .316	- .525
40	- .733	.217	.553

Table VI

Loadings of Set I Paintings in the

Kruskal Four-Dimension Solution

Painting	Dimension 1	2	3	4
1	- .060	- .722	- .219	.408
2	- .449	.266	- .499	- .017
3	- .782	- .301	- .465	.171
4	- .123	.052	- .646	.417
5	- .069	.066	- .768	.302
6	- .014	- .202	.126	- .783
7	.126	.539	1.007	.007
8	-1.015	.262	- .053	.158
9	- .612	- .606	- .136	- .135
10	.145	.275	- .050	.663
11	- .534	.469	.955	- .211
12	-1.005	.115	.334	- .052
13	- .587	.512	.962	- .167
14	- .169	- .701	- .036	.694
15	1.153	- .069	.086	- .013
16	-1.006	- .256	- .497	.417
17	.143	- .628	- .124	.813
18	- .412	.141	- .548	.655
19	- .273	.494	.070	- .521
20	.563	- .767	- .149	.252
21	.940	.125	.577	- .307
22	1.074	.655	.473	- .321
23	.442	- .257	- .293	- .713
24	- .419	.280	- .454	.628
25	- .065	.191	.829	- .271
26	- .905	.233	- .154	.125
27	- .300	- .678	.546	- .212
28	.833	.030	- .034	- .498
29	1.035	- .216	.415	- .066
30	.415	.153	- .700	- .025
31	.647	.674	- .016	.106
32	.084	- .023	- .537	- .681
33	.631	.258	.650	- .583
34	.397	- .573	.457	- .259
35	1.172	.250	.457	- .081
36	- .838	- .260	- .467	.586
37	.599	.268	- .352	- .301
38	.653	.076	- .606	- .113
39	- .680	- .370	- .641	.118
40	- .738	.243	.500	- .189

Table VII

Loadings of Set I Paintings in the Kruskal Five-Dimension Solution

Painting	Dimension 1	2	3	4	5
1	.103	- .739	- .195	.384	- .168
2	- .496	.310	- .225	.206	- .304
3	- .530	- .193	- .441	- .077	- .662
4	- .407	- .018	- .332	.640	- .076
5	- .229	.017	- .697	.410	- .038
6	- .473	- .150	.139	- .653	.243
7	.376	.685	.820	- .258	.088
8	- .269	.204	.221	.330	- .885
9	- .504	- .569	.062	- .072	- .454
10	.373	.374	- .316	.429	- .062
11	.376	.399	.732	- .577	- .525
12	- .112	.087	.391	- .178	- .954
13	.256	.551	.670	- .546	- .550
14	.385	- .689	- .175	.394	- .422
15	.200	- .097	.185	.311	1.069
16	- .488	- .209	- .431	.205	- .971
17	.623	- .575	- .550	.245	- .243
18	- .078	.138	- .597	.572	- .490
19	.141	.364	- .103	- .647	- .224
20	.520	- .733	- .256	.159	.309
21	.741	- .035	.468	- .050	.726
22	.680	.507	.252	- .218	.940
23	.227	- .368	- .277	- .547	.488
24	- .115	.288	- .433	.602	- .484
25	- .200	.334	.718	- .392	.078
26	- .006	.137	.005	.159	- .909
27	- .163	- .609	.696	- .115	- .242
28	- .174	- .006	.065	- .251	.923
29	.147	- .162	.545	.186	.946
30	- .356	.119	- .473	.291	.520
31	.485	.562	- .171	.098	.548
32	.148	- .026	- .599	- .622	.172
33	.344	.118	.593	- .518	.667
34	- .221	- .465	.595	.117	.427
35	.363	.284	.418	.053	1.086
36	- .238	- .196	- .610	.217	- .888
37	- .227	.299	- .314	- .157	.698
38	- .325	.020	- .407	.114	.752
39	- .702	- .297	- .438	.091	- .491
40	- .175	.336	.467	- .336	- .639

TABLE VIII

Loadings of Set II Paintings in the Kruskal One-Dimension Solution

Painting	Dimension 1
1	.038
2	-1.114
3	.077
4	-1.371
5	- .516
6	- .079
7	- .492
8	-1.310
9	- .881
10	- .566
11	- .932
12	-1.389
13	- .677
14	- .205
15	- .032
16	-1.270
17	1.075
18	.212
19	- .311
20	3.088
21	1.133
22	- .964
23	.516
24	.286
25	1.016
26	- .137
27	- .208
28	2.601
29	.580
30	.337
31	- .382
32	1.171
33	.149
34	- .111
35	1.321
36	1.321
37	- .275
38	- .095
39	- .288
40	-1.313

Table IX

Loadings of Set II Paintings in the Kruskal Two-Dimension Solution

Painting	Dimension 1	2
1	.509	- .964
2	- .926	.387
3	.654	- .336
4	- .980	.188
5	- .380	- .058
6	.270	- .731
7	- .306	.182
8	-1.071	- .455
9	- .359	- .953
10	- .407	.523
11	- .397	-1.068
12	-1.026	.398
13	- .806	.818
14	.258	-1.108
15	.059	- .218
16	-1.071	- .447
17	.695	.697
18	.472	- .595
19	- .243	1.031
20	.883	1.579
21	.258	1.354
22	- .657	- .893
23	.590	.133
24	.721	- .615
25	.461	.943
26	.231	- .952
27	.200	- .890
28	.777	1.506
29	.462	.501
30	.457	- .146
31	- .344	- .586
32	.245	1.551
33	.146	.031
34	.107	- .625
35	.676	1.075
36	.676	1.055
37	- .095	- .945
38	.053	- .475
39	.262	- .426
40	-1.050	- .470

Table X

Loadings of Set II Paintings in the Kruskal Three-Dimension Solution

Painting	Dimension 1	2	3
1	.186	-1.010	.361
2	- .798	.395	- .497
3	- .299	- .514	.685
4	- .683	.263	- .680
5	- .087	.050	- .382
6	.494	- .585	- .140
7	- .664	.097	.148
8	- .367	- .242	-1.043
9	- .442	- .905	- .256
10	- .555	.512	- .084
11	- .089	- .929	- .561
12	- .724	.464	- .677
13	- .502	.857	- .543
14	.180	-1.089	.092
15	- .570	- .449	.242
16	- .127	- .162	-1.088
17	.510	.586	.531
18	.204	- .651	.388
19	- .142	.999	- .162
20	.604	1.341	.767
21	.298	1.272	.214
22	.102	- .619	- .831
23	.244	.020	.591
24	.681	- .572	.314
25	.560	.863	.253
26	- .093	- .922	.168
27	.409	- .824	- .059
28	.557	1.294	.653
29	.410	.439	.312
30	- .266	- .264	.652
31	.453	- .333	- .547
32	.284	1.492	.233
33	- .196	- .019	.318
34	- .356	- .737	.292
35	.290	.910	.715
36	.281	.899	.728
37	.050	- .888	- .235
38	.288	- .373	- .087
39	.288	- .398	.230
40	- .414	- .271	-1.015

Table XI

Loadings of Set II Paintings in the

Kruskal Four-Dimension Solution

Painting	Dimension 1	2	3	4
1	.312	- .936	.358	.218
2	- .710	.533	- .335	.371
3	- .189	- .298	.770	.360
4	- .535	.470	- .543	.493
5	- .256	- .127	- .430	- .279
6	.552	- .494	- .066	.084
7	- .474	.270	.343	.463
8	- .257	- .061	- .982	.439
9	- .214	- .618	- .115	.812
10	- .647	.510	.029	.041
11	- .084	- .871	- .529	.324
12	- .596	.640	- .520	.391
13	- .362	.917	- .486	.110
14	.258	- .677	.284	.747
15	- .609	- .522	.134	- .157
16	- .016	- .042	-1.024	.319
17	.517	.528	.357	- .372
18	.275	- .706	.333	- .075
19	- .183	.924	- .223	- .258
20	.456	.926	.525	-1.007
21	.309	1.124	.119	- .563
22	.215	- .447	- .795	.355
23	.245	.041	.652	- .049
24	.634	- .273	.388	.443
25	.348	.464	.080	- .833
26	- .076	- .953	.157	.175
27	.470	- .345	.017	.598
28	.437	.933	.378	- .964
29	.253	.136	.180	- .632
30	- .334	- .502	.511	- .315
31	.374	- .419	- .585	- .118
32	.243	1.254	.103	- .713
33	- .332	- .049	.427	- .047
34	- .424	- .765	.270	.105
35	.190	.577	.535	- .814
36	.156	.544	.549	- .818
37	.145	- .872	.194	.275
38	.075	- .648	.108	- .298
39	.128	- .085	.369	.716
40	- .291	- .081	- .934	.476

Table XII

Loadings of Set II Paintings in the Kruskal Five-Dimension Solution

Painting	Dimension 1	2	3	4	5
1	.253	- .946	.239	.375	.056
2	- .607	.608	.016	.087	- .554
3	.147	- .054	.192	.842	.234
4	- .406	.561	- .203	.128	- .689
5	- .252	- .077	- .563	- .153	- .061
6	.604	- .522	- .062	.174	.011
7	- .485	.188	.579	.082	- .244
8	.007	.138	- .577	.171	- .876
9	- .077	- .514	.251	.441	- .756
10	- .702	.490	.108	- .020	- .107
11	.021	- .779	- .393	.257	- .583
12	- .503	.689	- .158	- .059	- .645
13	- .326	.925	- .216	- .243	- .369
14	.233	- .686	.604	.234	- .401
15	- .587	- .420	- .235	.361	.181
16	.260	.124	- .630	- .012	- .836
17	.395	.352	.039	- .198	.661
18	.097	- .786	.177	.027	.264
19	- .269	.783	- .191	- .566	.052
20	.250	.743	.130	- .551	1.125
21	.327	1.059	.038	- .253	.545
22	.414	- .299	- .502	.093	- .692
23	.046	- .060	.636	- .019	.412
24	.565	- .346	.611	.017	- .158
25	.241	.321	- .149	- .624	.660
26	- .248	- .940	.103	.146	- .110
27	.526	- .255	.176	.596	- .185
28	.268	.791	- .014	- .492	1.013
29	.003	- .027	- .066	- .542	.525
30	- .235	- .283	- .125	.545	.517
31	.481	- .359	- .530	- .141	- .210
32	.227	1.147	.053	- .462	.609
33	- .394	- .064	.337	.269	.282
34	- .285	- .601	- .105	.628	.117
35	.028	.418	.249	- .479	.894
36	- .052	.356	.262	- .474	.925
37	.108	- .826	.015	- .080	- .419
38	- .029	- .697	- .254	- .196	.082
39	- .026	- .286	.709	- .131	- .389
40	- .021	.135	- .551	.222	- .883

TABLE XIII

INTER-PAINTING DISTANCES FOR SET I
(Based on Kruskal Six-Dimension Solution)[a]

Target Painting	1		2		3		4		5		6		7	
	14	.37	8	.62	16	.43	5	.55	4	.55	28	.83	25	.63
	17	.71	26	.62	36	.51	18	.62	18	.53	25	.93	13	.66
	20	.72	5	.71	39	.32	24	.61	30	.65	37	.96	11	.80
	9	.92	30	.93	9	.82	30	.84	24	.69	40	1.22	10	1.16
	5	1.02	18	.82	24	.97	39	.85	2	.71	38	1.11	33	1.01
	4	1.02	4	.84	18	.96	2	.84	38	.93	9	.99	35	1.15
	18	1.07	24	.85	4	.98	16	.99	39	.99	19	.97	40	1.06
	2	1.18	12	1.04	26	1.06	38	1.01	10	.98	32	.98	22	1.11
	7	1.10	40	1.08	2	1.04	3	.98	36	1.00	30	1.26	21	1.21
	30	1.26	39	1.00	5	1.05	10	.99	1	1.02	27	1.11	19	1.23
	36	1.13	9	1.03	12	1.16	36	1.02	16	1.10	33	1.17	29	1.30
	39	1.15	36	1.06	40	1.19	1	1.02	26	1.12	23	1.08	31	1.25
	8	1.30	14	1.25	8	1.19	9	1.13	3	1.05	2	1.30	15	1.46
	10	1.23	38	1.19	17	1.31	8	1.15	37	1.10	34	1.10	12	1.40
	6	1.46	19	1.00	1	1.23	31	1.33	31	1.18	1	1.46	34	1.41
	24	1.22	3	1.04	6	1.25	14	1.21	17	1.19	39	1.22	26	1.64
	3	1.23	1	1.18	10	1.09	26	1.20	20	1.30	3	1.25	6	1.43
	38	1.37	16	1.03	14	1.33	34	1.26	8	1.19	11	1.40	28	1.46
	16	1.21	32	1.16	19	1.35	37	1.26	32	1.19	13	1.44	27	1.48
	26	1.22	37	1.26	38	1.42	23	1.45	9	1.25	5	1.49	37	1.50
	32	1.28	6	1.30	32	1.42	25	1.58	23	1.28	29	1.33	24	1.54
	23	1.22	23	1.14	37	1.43	20	1.41	14	1.15	20	1.38	3	1.63
	34	1.22	10	1.32	25	1.31	27	1.45	19	1.36	12	1.46	32	1.66
	15	1.46	31	1.32	30	1.38	17	1.34	6	1.49	21	1.51	4	1.71
	37	1.53	28	1.48	27	1.41	15	1.34	34	1.53	36	1.61	8	1.71
	28	1.54	27	1.37	20	1.58	12	1.44	40	1.55	14	1.63	9	1.71
	40	1.61	17	1.48	28	1.66	32	1.53	28	1.42	7	1.43	38	1.71
	25	1.63	25	1.58	13	1.51	40	1.44	15	1.46	15	1.45	23	1.73
	12	1.44	11	1.59	34	1.54	29	1.47	12	1.53	26	1.47	30	1.82
	31	1.56	15	1.71	7	1.63	28	1.45	27	1.65	35	1.50	17	1.66
	33	1.76	34	1.47	31	1.75	6	1.51	25	1.72	31	1.56	20	1.70
	29	1.49	13	1.58	29	1.85	19	1.54	29	1.64	17	1.62	2	1.72
	21	1.54	21	1.67	33	1.92	35	1.63	21	1.68	22	1.63	18	1.72
	19	1.55	22	1.79	35	2.01	7	1.71	33	1.75	4	1.51	39	1.76
	11	1.76	20	1.55	22	2.10	22	1.75	13	1.88	16	1.57	36	1.78
	35	1.76	33	1.57	11	1.62	13	1.80	35	1.70	10	1.52	14	1.78
	13	1.81	7	1.72	23	1.74	21	1.66	22	1.71	8	1.57	1	1.80
	7	1.80	29	1.78	15	1.86	33	1.69	7	1.82	24	1.70	5	1.82
	22	1.89	35	1.86	21	2.06	11	1.89	11	1.93	18	1.72	16	1.84

TABLE XIII (Continued)

Target Painting	8		9		10		11		12		13		14	
	26	.36	27	.76	18	.87	13	.31	8	.60	11	.31	1	.37
	12	.60	39	.69	24	.81	7	.80	40	.51	7	.66	17	.61
	2	.62	3	.82	25	1.24	40	.76	26	.60	40	.67	20	.84
	40	.87	16	.89	7	1.16	12	.95	11	.95	25	.80	18	1.08
	18	1.03	1	.92	4	.99	25	.89	13	.93	12	.93	2	1.25
	24	.98	34	1.10	5	.98	19	.98	2	1.04	19	1.05	36	1.12
	16	1.02	2	1.03	36	1.08	33	1.24	27	1.09	33	1.30	27	1.20
	9	1.09	12	1.06	17	.97	27	1.28	9	1.06	27	1.37	10	1.25
	36	1.10	6	.99	37	1.17	26	1.29	16	1.08	6	1.44	9	1.09
	4	1.15	26	1.05	39	1.21	6	1.40	36	1.16	8	1.39	8	1.25
	19	1.18	4	1.13	38	1.23	8	1.40	3	1.16	24	1.54	4	1.21
	3	1.19	8	1.09	30	1.23	21	1.46	19	1.10	26	1.30	24	1.23
	14	1.25	18	1.30	14	1.25	10	1.53	24	1.22	10	1.41	26	1.13
	27	1.27	36	1.03	31	1.00	32	1.55	39	1.26	36	1.61	5	1.15
	1	1.30	14	1.09	16	1.27	22	1.59	18	1.32	16	1.64	16	1.26
	5	1.19	25	1.30	1	1.23	2	1.59	7	1.40	18	1.71	39	1.33
	39	1.20	32	1.34	26	1.40	23	1.66	25	1.29	3	1.51	30	1.49
	30	1.50	5	1.25	20	1.24	20	1.78	14	1.36	21	1.55	3	1.33
	11	1.40	24	1.34	15	1.27	9	1.54	4	1.44	9	1.55	32	1.34
	13	1.39	23	1.36	2	1.32	31	1.57	6	1.46	31	1.56	23	1.35
	23	1.49	37	1.52	32	1.36	14	1.65	34	1.56	2	1.58	12	1.36
	10	1.53	40	1.17	3	1.09	17	1.69	1	1.44	22	1.59	19	1.53
	34	1.60	20	1.33	35	1.31	36	1.70	5	1.53	32	1.65	40	1.59
	25	1.63	17	1.33	28	1.42	16	1.75	10	1.53	39	1.68	6	1.63
	31	1.64	19	1.34	22	1.33	1	1.76	32	1.60	14	1.72	34	1.45
	32	1.54	10	1.47	29	1.36	37	1.78	33	1.64	37	1.76	31	1.59
	7	1.71	28	1.50	19	1.36	34	1.59	23	1.65	23	1.79	21	1.59
	20	1.79	30	1.39	34	1.50	3	1.62	31	1.76	4	1.80	11	1.65
	6	1.57	38	1.42	11	1.53	24	1.67	21	1.81	1	1.81	15	1.66
	17	1.62	11	1.54	23	1.61	35	1.72	17	1.63	5	1.88	29	1.69
	38	1.72	13	1.55	13	1.41	28	1.75	30	1.79	34	1.61	37	1.72
	33	1.73	29	1.64	40	1.43	29	1.77	20	1.83	35	1.70	13	1.72
	37	1.76	7	1.71	21	1.47	39	1.78	37	1.85	17	1.72	28	1.76
	21	1.82	21	1.82	9	1.47	18	1.80	38	1.91	29	1.77	38	1.62
	28	1.89	31	1.85	8	1.53	4	1.89	28	1.92	28	1.77	25	1.69
	29	2.03	33	1.69	12	1.53	5	1.93	29	2.00	20	1.87	7	1.78
	15	2.03	15	1.73	33	1.56	15	1.93	22	2.03	15	1.92	33	1.84
	22	2.04	35	1.95	6	1.52	38	2.00	15	2.09	38	1.97	35	1.88
	35	2.13	22	2.14	27	1.66	30	2.02	35	2.09	30	2.00	22	1.93

TABLE XIII (Continued)

Target Painting	15		16		17		18		19		20		21	
	29	.37	3	.43	14	.61	24	.30	32	.78	17	.69	33	.64
	35	.54	36	.34	20	.69	4	.62	40	.90	1	.72	35	.73
	28	.80	39	.52	1	.71	5	.53	11	.98	14	.84	15	.89
	21	.89	24	.90	36	1.14	10	.87	26	.99	23	1.07	22	.70
	38	.90	9	.89	10	.97	36	.73	13	1.05	15	1.17	29	.85
	22	.98	18	.86	18	1.15	2	.82	6	.97	28	1.25	31	.92
	33	1.07	26	.94	5	1.19	16	.86	2	1.00	32	1.08	28	1.09
	34	.96	4	.99	32	1.22	39	.99	24	1.40	29	1.21	34	1.13
	20	1.17	8	1.02	3	1.31	14	1.08	25	1.13	5	1.30	37	1.33
	37	1.03	12	1.08	16	1.38	26	.96	8	1.18	21	1.25	23	1.05
	30	1.12	5	1.10	24	1.30	8	1.03	12	1.10	10	1.24	7	1.21
	23	1.26	2	1.03	9	1.33	3	.96	37	1.11	34	1.26	20	1.25
	10	1.27	10	1.27	31	1.47	30	1.13	33	1.15	38	1.27	38	1.39
	7	1.46	40	1.27	4	1.34	17	1.15	38	1.39	30	1.30	19	1.40
	24	1.65	17	1.38	39	1.39	1	1.07	23	1.07	37	1.32	11	1.46
	31	1.08	1	1.21	26	1.41	9	1.30	7	1.23	27	1.34	6	1.51
	4	1.34	14	1.26	2	1.48	38	1.35	28	1.26	9	1.33	17	1.62
	1	1.46	34	1.70	27	1.52	31	1.31	30	1.34	35	1.41	25	1.37
	32	1.57	13	1.64	38	1.55	12	1.32	21	1.40	4	1.41	27	1.43
	25	1.43	20	1.73	21	1.62	40	1.43	27	1.42	31	1.38	32	1.46
	6	1.45	23	1.89	23	1.49	19	1.45	31	1.15	6	1.38	10	1.47
	5	1.46	27	1.48	19	1.54	32	1.46	9	1.34	36	1.58	26	1.81
	17	1.57	19	1.55	37	1.55	37	1.46	5	1.36	26	1.65	30	1.46
	2	1.71	30	1.55	15	1.57	13	1.71	18	1.45	19	1.53	1	1.54
	14	1.66	6	1.57	6	1.62	20	1.48	34	1.57	39	1.55	13	1.55
	19	1.71	38	1.68	29	1.63	34	1.68	3	1.35	3	1.58	14	1.59
	40	1.88	11	1.75	40	1.75	21	1.82	10	1.36	24	1.59	40	1.61
	27	1.58	37	1.75	30	1.50	23	1.60	14	1.53	16	1.73	2	1.67
	18	1.69	25	1.60	25	1.61	27	1.67	22	1.40	11	1.78	5	1.68
	9	1.73	32	1.65	34	1.61	15	1.69	39	1.46	18	1.48	24	1.75
	39	1.77	7	1.84	11	1.69	25	1.71	36	1.48	22	1.56	12	1.81
	3	1.86	31	1.92	22	1.79	6	1.72	20	1.53	33	1.56	9	1.82
	13	1.92	28	1.97	8	1.62	7	1.72	17	1.54	8	1.79	18	1.82
	11	1.93	15	2.08	12	1.63	28	1.76	29	1.69	2	1.55	4	1.66
	36	2.02	29	2.08	7	1.66	11	1.80	4	1.54	25	1.56	8	1.82
	26	2.03	33	2.14	28	1.67	29	1.83	1	1.55	7	1.70	39	2.05
	8	2.03	21	2.22	13	1.72	22	1.84	16	1.55	12	1.83	3	2.06
	16	2.08	35	2.26	35	1.74	35	1.87	35	1.59	40	1.85	36	2.15
	12	2.09	22	2.32	33	1.88	33	1.90	15	1.71	13	1.87	16	2.22

TABLE XIII (Continued)

Target Painting	22		23		24		25		26		27		28	
	31	.63	32	.82	18	.30	7	.63	8	.36	34	.76	37	.55
	35	.56	38	1.05	36	.82	13	.80	12	.60	9	.76	38	.65
	21	.70	20	1.07	4	.61	11	.89	2	.62	12	1.09	6	.83
	33	.82	28	.93	5	.69	6	.93	16	.94	25	1.15	15	.80
	29	1.05	30	.98	10	.81	10	1.24	36	.94	14	1.20	30	.94
	15	.98	33	1.10	16	.90	40	.95	24	.96	29	1.38	29	.81
	23	1.38	37	1.05	2	.85	27	1.15	18	.96	1	1.10	33	.90
	28	1.11	22	1.38	26	.96	34	1.12	39	1.14	6	1.11	35	.88
	7	1.11	6	1.08	39	1.02	19	1.13	3	1.06	40	1.13	21	1.09
	37	1.15	15	1.26	3	.97	33	1.04	40	.88	8	1.27	23	.93
	25	1.39	21	1.05	8	.98	28	1.21	19	.99	26	1.31	34	1.02
	34	1.53	19	1.07	19	1.40	9	1.30	9	1.05	11	1.28	32	1.10
	10	1.33	2	1.14	30	1.18	29	1.21	5	1.12	23	1.29	22	1.11
	38	1.35	31	1.18	12	1.22	4	1.58	27	1.31	20	1.34	31	1.15
	19	1.40	34	1.21	14	1.23	35	1.27	11	1.29	13	1.37	20	1.25
	30	1.46	5	1.28	1	1.22	22	1.39	10	1.40	19	1.42	25	1.21
	32	1.51	27	1.29	31	1.25	32	1.47	14	1.13	39	1.34	19	1.26
	11	1.59	9	1.36	40	1.26	31	1.47	4	1.20	4	1.45	10	1.42
	6	1.63	4	1.45	9	1.34	12	1.29	32	1.31	2	1.37	2	1.48
	20	1.56	35	1.40	38	1.37	37	1.31	1	1.22	28	1.47	27	1.47
	13	1.59	1	1.22	15	1.65	39	1.40	17	1.41	17	1.52	1	1.54
	40	1.73	29	1.32	17	1.30	2	1.58	31	1.56	32	1.56	5	1.42
	4	1.75	14	1.35	13	1.54	1	1.63	7	1.64	33	1.33	7	1.46
	17	1.79	8	1.49	32	1.55	3	1.31	20	1.65	3	1.41	9	1.50
	2	1.79	10	1.61	34	1.61	21	1.37	13	1.30	21	1.43	40	1.64
	3	2.10	26	1.42	20	1.59	15	1.43	23	1.42	7	1.48	3	1.66
	5	1.71	17	1.49	37	1.45	38	1.50	6	1.47	5	1.65	4	1.45
	24	1.74	40	1.56	7	1.54	23	1.58	37	1.65	30	1.66	39	1.59
	18	1.84	25	1.58	27	1.64	8	1.63	21	1.81	16	1.48	14	1.76
	1	1.89	12	1.65	21	1.75	30	1.67	30	1.47	36	1.57	17	1.67
	27	1.90	11	1.66	29	1.75	5	1.72	25	1.55	24	1.64	24	1.73
	14	1.93	16	1.89	25	1.57	26	1.55	34	1.67	37	1.70	11	1.75
	26	1.98	39	1.67	23	1.66	17	1.61	38	1.68	15	1.58	18	1.76
	12	2.03	7	1.73	11	1.67	20	1.56	33	1.74	38	1.64	13	1.77
	8	2.04	13	1.79	6	1.70	24	1.57	28	1.84	10	1.66	26	1.84
	9	2.11	36	1.84	28	1.73	16	1.60	22	1.98	18	1.67	8	1.89
	39	2.14	18	1.60	22	1.74	36	1.60	15	2.03	35	1.72	12	1.92
	36	2.21	24	1.66	35	1.77	14	1.69	29	2.04	31	1.82	36	1.94
	16	2.32	3	1.74	33	1.78	18	1.71	35	2.10	22	1.90	16	1.97

TABLE XIII (Continued)

Target Painting	29		30		31		32		33		34		35	
	15	.37	38	.39	22	.63	19	.78	21	.64	27	.76	15	.54
	35	.55	37	.68	37	.95	23	.82	35	.82	29	.75	29	.55
	34	.75	5	.65	35	.94	37	.91	28	.90	9	1.10	22	.56
	28	.81	4	.84	21	.92	6	.98	22	.82	33	1.05	21	.73
	21	.85	2	.93	33	1.08	30	1.10	34	1.05	15	.96	33	.82
	22	1.05	28	.94	30	1.06	28	1.10	29	.93	25	1.12	31	.94
	33	.93	18	1.13	38	1.10	38	1.14	15	1.07	28	1.02	28	.88
	38	1.09	23	.98	28	1.15	2	1.16	7	1.01	35	1.20	7	1.15
	27	1.38	32	1.10	32	1.21	31	1.21	31	1.08	21	1.13	34	1.20
	37	1.16	10	1.23	4	1.33	20	1.08	23	1.10	6	1.10	37	1.09
	20	1.21	6	1.26	10	1.00	9	1.34	6	1.17	38	1.20	38	1.18
	31	1.26	31	1.06	5	1.18	5	1.19	25	1.04	23	1.21	25	1.27
	7	1.30	15	1.12	29	1.26	17	1.22	19	1.15	4	1.26	10	1.31
	25	1.21	1	1.26	23	1.18	26	1.31	11	1.24	20	1.26	23	1.40
	30	1.33	24	1.18	24	1.25	10	1.36	40	1.30	30	1.34	20	1.41
	23	1.32	8	1.50	7	1.25	1	1.28	37	1.19	37	1.36	30	1.39
	6	1.33	20	1.30	15	1.08	18	1.46	13	1.30	39	1.40	6	1.50
	10	1.36	34	1.34	19	1.15	25	1.47	38	1.33	22	1.53	32	1.60
	4	1.47	19	1.34	18	1.31	39	1.47	27	1.33	19	1.57	19	1.59
	32	1.62	29	1.33	2	1.32	14	1.34	32	1.44	1	1.22	4	1.63
	17	1.63	14	1.49	17	1.47	3	1.42	30	1.46	7	1.41	1	1.76
	19	1.69	39	1.26	25	1.47	4	1.53	12	1.64	10	1.50	40	1.79
	1	1.49	35	1.39	20	1.38	24	1.55	1	1.76	5	1.53	3	2.01
	5	1.64	36	1.52	26	1.56	27	1.56	20	1.56	12	1.56	13	1.70
	9	1.64	3	1.38	34	1.55	15	1.57	10	1.56	24	1.61	5	1.70
	14	1.69	33	1.46	1	1.56	34	1.61	26	1.74	32	1.61	11	1.72
	24	1.75	22	1.46	6	1.56	33	1.44	5	1.75	16	1.70	27	1.72
	3	1.85	27	1.66	14	1.59	21	1.46	39	1.91	14	1.45	17	1.74
	40	1.76	25	1.67	8	1.64	22	1.51	3	1.92	31	1.55	24	1.77
	11	1.77	9	1.39	40	1.55	11	1.55	2	1.57	8	1.60	2	1.86
	13	1.77	21	1.46	13	1.56	12	1.60	4	1.69	40	1.41	18	1.87
	39	1.77	26	1.47	11	1.57	35	1.60	9	1.69	2	1.47	14	1.88
	2	1.78	17	1.50	3	1.75	29	1.62	8	1.73	3	1.54	9	1.95
	18	1.83	16	1.55	12	1.76	36	1.51	24	1.78	17	1.61	39	1.99
	12	2.00	7	1.82	36	1.78	40	1.53	14	1.84	26	1.67	12	2.09
	8	2.03	40	1.67	9	1.85	8	1.54	17	1.88	18	1.68	26	2.10
	26	2.04	12	1.79	39	1.79	13	1.65	18	1.90	11	1.59	8	2.13
	36	2.06	13	2.00	27	1.82	7	1.66	36	2.13	13	1.61	36	2.18
	16	2.08	11	2.02	16	1.92	16	1.65	16	2.14	36	1.78	16	2.26

TABLE XIII (Continued)

Target Painting	36		37		38		39		40	
	16	.34	28	.55	30	.39	3	.32	12	.51
	3	.51	38	.47	28	.65	16	.52	13	.67
	24	.82	30	.68	37	.47	9	.69	11	.76
	39	.68	31	.95	15	.90	36	.68	8	.87
	18	.73	6	.96	5	.93	4	.85	6	1.22
	26	.94	32	.91	4	1.01	18	.99	25	.95
	17	1.14	10	1.17	23	1.05	5	.99	2	1.08
	4	1.02	15	1.03	6	1.11	24	1.02	19	.90
	12	1.16	23	1.05	29	1.09	26	1.14	26	.88
	5	1.00	5	1.10	2	1.19	2	1.00	27	1.13
	2	1.06	29	1.16	10	1.23	10	1.21	3	1.19
	10	1.08	35	1.09	31	1.10	1	1.15	7	1.06
	14	1.12	19	1.11	32	1.14	38	1.30	16	1.27
	8	1.10	2	1.26	35	1.18	8	1.20	33	1.30
	9	1.03	21	1.33	39	1.30	6	1.22	24	1.26
	1	1.13	22	1.15	19	1.39	12	1.26	36	1.35
	40	1.35	33	1.19	34	1.20	40	1.29	9	1.17
	30	1.52	4	1.26	20	1.27	14	1.33	39	1.29
	20	1.58	20	1.32	33	1.33	27	1.34	18	1.43
	6	1.61	34	1.36	18	1.35	34	1.40	5	1.55
	19	1.48	9	1.52	1	1.37	37	1.41	14	1.59
	13	1.61	39	1.41	24	1.37	32	1.47	1	1.61
	38	1.65	25	1.31	21	1.39	30	1.26	10	1.43
	32	1.51	3	1.43	3	1.42	17	1.39	4	1.44
	27	1.57	18	1.46	17	1.55	25	1.40	23	1.56
	11	1.70	1	1.53	22	1.35	19	1.46	37	1.59
	31	1.78	7	1.50	25	1.50	20	1.55	28	1.64
	23	1.84	17	1.55	36	1.65	28	1.59	17	1.75
	25	1.60	40	1.59	9	1.42	23	1.67	34	1.41
	37	1.68	26	1.65	16	1.68	13	1.68	32	1.53
	7	1.78	24	1.45	26	1.68	33	1.91	31	1.55
	34	1.78	27	1.70	7	1.71	7	1.76	21	1.61
	28	1.94	14	1.72	14	1.62	29	1.77	22	1.73
	15	2.02	16	1.75	27	1.64	15	1.77	35	1.79
	29	2.06	13	1.76	40	1.71	11	1.78	15	1.88
	33	2.13	11	1.78	8	1.72	31	1.79	30	1.67
	21	2.15	36	1.68	12	1.91	35	1.99	38	1.71
	35	2.18	8	1.76	13	1.97	21	2.05	29	1.76
	22	2.21	12	1.85	11	2.00	22	2.14	20	1.85

a. Distances are given in the order yielded by the computer program, with paintings appearing in a sequence which approximately parallels their distance from the target painting.

TABLE XIV

INTER-PAINTING DISTANCES FOR SET II
(Based on Kruskal Six-Dimension Solution)[a]

Target Painting	1		2		3		4		5		6		7	
	18	.42	12	.34	30	.76	12	.25	31	.80	31	.69	10	.64
	37	.72	4	.38	27	.76	2	.38	10	.94	27	.61	23	.89
	14	.76	10	.54	6	1.11	13	.57	38	.76	38	.82	39	.84
	6	.77	13	.61	34	.91	40	.78	33	.92	1	.77	33	.74
	26	.73	7	.86	1	1.08	10	.84	22	1.01	18	.81	2	.86
	11	.98	40	1.02	15	1.09	8	.81	8	1.01	24	.96	5	1.21
	24	.90	8	1.04	23	1.02	19	.99	29	1.09	3	1.11	3	1.23
	27	.91	19	1.08	7	1.23	16	1.02	34	1.10	37	.91	12	1.11
	34	.87	33	1.24	33	1.04	7	1.12	26	1.16	14	.95	13	1.22
	23	1.17	5	1.14	24	1.16	5	1.15	16	1.01	11	1.01	30	1.30
	38	.97	16	1.25	18	1.17	39	1.33	40	1.07	22	.95	4	1.12
	3	1.08	15	1.33	14	1.21	9	1.18	7	1.21	39	1.20	14	1.25
	9	1.01	9	1.38	26	1.32	22	1.28	30	1.10	33	1.05	38	1.29
	30	1.08	39	1.31	39	1.36	11	1.43	25	1.18	23	1.02	34	1.25
	15	1.11	23	1.50	9	1.23	15	1.29	11	1.06	26	1.06	26	1.26
	39	1.18	3	1.44	29	1.52	3	1.47	18	1.22	34	1.15	19	1.34
	33	1.32	21	1.52	17	1.42	27	1.53	15	1.13	5	1.20	15	1.34
	29	1.42	29	1.55	10	1.44	33	1.43	2	1.14	30	1.22	18	1.42
	5	1.46	32	1.56	38	1.44	29	1.54	4	1.15	29	1.36	40	1.48
	31	1.28	11	1.58	4	1.47	34	1.51	12	1.21	40	1.37	31	1.49
	22	1.32	22	1.48	5	1.47	30	1.52	13	1.28	16	1.31	27	1.24
	40	1.65	34	1.48	31	1.48	24	1.52	19	1.30	8	1.37	36	1.40
	7	1.58	27	1.54	40	1.43	26	1.60	37	1.17	15	1.44	9	1.43
	8	1.67	14	1.62	2	1.44	32	1.64	6	1.20	9	1.29	8	1.51
	36	1.72	35	1.68	37	1.44	6	1.69	14	1.55	25	1.41	24	1.39
	4	1.85	36	1.70	22	1.52	18	1.74	1	1.46	17	1.43	35	1.43
	17	1.53	18	1.78	11	1.43	1	1.85	17	1.50	7	1.42	37	1.54
	16	1.68	30	1.46	21	1.49	31	1.52	3	1.47	35	1.49	21	1.57
	25	1.69	31	1.57	8	1.50	37	1.52	23	1.35	36	1.52	6	1.42
	35	1.72	17	1.59	35	1.50	14	1.56	36	1.39	21	1.58	29	1.44
	10	1.84	38	1.61	12	1.61	17	1.56	35	1.40	10	1.65	17	1.49
	2	1.91	26	1.61	16	1.62	21	1.59	27	1.42	4	1.69	1	1.58
	19	1.95	24	1.63	25	1.63	38	1.63	24	1.60	19	1.77	11	1.59
	28	1.97	25	1.65	13	1.65	23	1.63	9	1.44	28	1.71	22	1.64
	12	2.00	37	1.67	36	1.55	25	1.66	21	1.48	2	1.73	32	1.64
	20	2.01	6	1.73	28	1.62	35	1.78	39	1.41	32	1.77	16	1.66
	21	2.02	28	1.80	32	1.67	36	1.81	32	1.58	20	1.80	25	1.60
	13	2.07	20	1.88	20	1.67	28	1.84	28	1.63	12	1.81	28	1.77
	32	2.18	1	1.91	19	1.70	20	1.93	20	1.72	13	1.83	20	1.79

TABLE XIV (Continued)

Target Painting	8		9		10		11		12		13		14	
	40	.12	37	.77	2	.54	37	.60	4	.25	12	.39	24	.56
	16	.29	24	.85	7	.64	22	.68	2	.34	4	.57	39	.58
	22	.64	14	.78	12	.77	26	.82	13	.39	19	.56	9	.78
	4	.81	15	.97	4	.84	1	.98	10	.77	2	.61	1	.76
	11	1.00	11	.91	5	.94	31	.94	19	.88	10	.84	26	.84
	12	.97	39	1.00	13	.84	18	1.04	40	.96	32	1.25	37	.79
	5	1.01	22	1.14	33	.93	8	1.00	8	.97	8	1.15	27	.84
	2	1.04	26	1.00	19	1.02	9	.91	16	1.16	7	1.22	18	.86
	31	1.04	18	1.09	23	1.23	6	1.01	7	1.11	40	1.14	6	.95
	13	1.15	1	1.01	30	1.30	38	.92	5	1.21	21	1.27	23	1.11
	9	1.20	34	1.13	29	1.30	16	1.01	39	1.40	5	1.28	34	1.20
	37	1.29	40	1.15	25	1.40	40	1.01	9	1.36	16	1.27	11	1.10
	6	1.37	27	1.15	39	1.26	15	1.18	15	1.43	29	1.37	38	1.16
	10	1.32	8	1.20	40	1.32	34	.99	33	1.48	28	1.50	7	1.25
	27	1.33	30	1.35	36	1.34	5	1.06	29	1.54	17	1.31	22	1.30
	38	1.44	4	1.18	35	1.36	27	1.13	32	1.55	39	1.49	3	1.21
	34	1.48	16	1.31	34	1.36	14	1.10	22	1.44	25	1.39	5	1.55
	7	1.51	2	1.38	38	1.38	24	1.32	21	1.53	15	1.51	15	1.32
	19	1.43	3	1.23	8	1.32	4	1.43	3	1.61	35	1.51	33	1.35
	24	1.54	12	1.37	21	1.39	30	1.30	11	1.62	9	1.52	31	1.38
	15	1.44	31	1.49	3	1.44	39	1.33	27	1.67	22	1.54	30	1.44
	33	1.49	33	1.58	15	1.27	33	1.40	14	1.69	33	1.54	29	1.53
	3	1.50	7	1.43	32	1.42	2	1.58	17	1.55	36	1.55	10	1.64
	30	1.53	6	1.29	17	1.46	3	1.43	31	1.61	20	1.59	17	1.49
	26	1.55	38	1.37	16	1.47	7	1.59	24	1.63	3	1.65	40	1.52
	14	1.55	23	1.51	26	1.49	12	1.62	25	1.63	37	1.77	8	1.55
	1	1.67	29	1.52	27	1.57	29	1.63	30	1.64	18	1.89	16	1.61
	29	1.67	17	1.53	14	1.64	23	1.65	23	1.66	23	1.61	2	1.62
	25	1.71	5	1.44	31	1.49	10	1.65	34	1.67	24	1.62	12	1.69
	23	1.80	13	1.52	9	1.57	13	1.80	37	1.68	31	1.65	4	1.56
	39	1.56	10	1.57	6	1.65	25	1.85	38	1.72	30	1.69	19	1.74
	18	1.65	19	1.56	37	1.67	17	1.87	35	1.74	27	1.75	13	1.79
	21	1.68	25	1.85	24	1.67	19	1.88	26	1.74	38	1.79	35	1.79
	17	1.77	35	1.95	22	1.60	35	2.06	36	1.77	14	1.79	36	1.80
	32	1.80	36	1.97	28	1.60	36	2.06	28	1.80	11	1.80	25	1.81
	35	1.97	21	2.05	18	1.62	21	2.13	6	1.81	34	1.81	21	2.02
	28	1.99	28	2.09	20	1.64	28	2.25	18	1.86	6	1.83	28	2.07
	36	2.01	20	2.15	11	1.65	32	2.28	20	1.88	26	1.89	20	2.10
	20	2.13	32	2.17	1	1.84	20	2.34	1	2.00	1	2.07	32	2.16

TABLE XIV (Continued)

Target Painting	15		16		17		18		19		20		21	
	34	.66	8	.29	19	.88	1	.42	13	.56	28	.20	32	.24
	30	.67	40	.38	25	.72	26	.64	17	.88	35	.51	28	.62
	9	.97	22	.49	20	.75	37	.68	12	.88	36	.62	20	.78
	26	.97	31	.90	35	.71	38	.71	4	.99	32	.72	35	.85
	3	1.09	11	1.01	28	.75	23	.98	29	.96	25	.69	25	.86
	37	1.10	4	1.02	36	.78	34	.84	2	1.03	21	.78	36	.98
	11	1.18	12	1.16	29	.63	6	.81	25	1.01	17	.75	17	1.06
	38	1.20	5	1.01	21	1.06	14	.86	36	1.19	29	.96	19	1.13
	18	.96	37	1.26	32	1.07	11	1.04	10	1.02	19	1.20	13	1.27
	1	1.11	2	1.25	23	1.04	24	.94	35	1.15	23	1.31	29	1.25
	29	1.12	9	1.31	24	1.09	27	1.08	20	1.20	30	1.61	33	1.41
	33	1.26	13	1.27	39	1.40	30	.97	32	1.06	13	1.59	23	1.32
	5	1.13	6	1.31	15	1.36	29	1.06	28	1.15	33	1.64	10	1.39
	23	1.33	38	1.40	5	1.50	9	1.09	21	1.13	24	1.74	2	1.52
	2	1.33	27	1.38	3	1.42	33	1.15	5	1.30	18	1.75	7	1.57
	4	1.29	10	1.47	30	1.44	15	.96	7	1.34	10	1.64	5	1.48
	14	1.32	34	1.58	33	1.50	5	1.22	39	1.46	3	1.67	3	1.49
	39	1.33	25	1.64	38	1.54	3	1.17	33	1.57	5	1.72	12	1.53
	7	1.34	19	1.47	27	1.56	39	1.08	8	1.43	15	1.75	31	1.53
	17	1.36	33	1.56	34	1.67	22	1.32	40	1.44	7	1.79	6	1.58
	12	1.43	26	1.61	18	1.28	31	1.17	15	1.44	6	1.80	16	1.66
	27	1.43	14	1.61	13	1.31	7	1.42	16	1.47	2	1.88	24	1.71
	6	1.44	3	1.62	6	1.43	17	1.28	24	1.48	31	1.88	22	1.77
	10	1.27	30	1.62	10	1.46	25	1.38	37	1.68	12	1.88	15	1.82
	40	1.42	18	1.64	37	1.52	36	1.40	38	1.69	38	1.88	30	1.58
	22	1.48	39	1.64	9	1.53	35	1.42	6	1.77	4	1.93	4	1.59
	31	1.54	7	1.66	7	1.49	16	1.64	23	1.44	27	1.95	27	1.64
	35	1.54	21	1.66	14	1.49	40	1.65	9	1.56	39	1.97	40	1.67
	24	1.34	32	1.79	31	1.60	28	1.73	22	1.62	34	1.99	8	1.68
	19	1.44	15	1.56	26	1.70	4	1.74	31	1.64	1	2.01	38	1.79
	8	1.44	28	1.56	1	1.53	20	1.75	30	1.66	37	2.10	18	1.84
	25	1.49	29	1.64	12	1.55	2	1.78	3	1.70	14	2.10	39	1.89
	13	1.51	1	1.68	4	1.56	13	1.89	18	1.71	16	2.11	34	1.93
	36	1.53	17	1.76	2	1.59	10	1.62	14	1.74	22	2.13	1	2.02
	28	1.73	23	1.84	22	1.70	8	1.65	27	1.81	40	2.13	14	2.02
	21	1.82	35	1.95	16	1.76	19	1.71	34	1.82	8	2.13	37	2.04
	16	1.56	28	1.96	40	1.77	21	1.84	26	1.85	9	2.15	9	2.05
	20	1.75	36	2.00	8	1.77	12	1.86	11	1.88	26	2.18	11	2.13
	32	1.90	20	2.11	11	1.87	32	1.97	1	1.95	11	2.34	26	2.15

TABLE XIV (Continued)

Target Painting	22		23		24		25		26		27		28	
	16	.49	36	.89	14	.56	35	.54	18	.64	6	.61	20	.20
	31	.64	33	.75	9	.85	29	.53	34	.69	3	.76	32	.58
	8	.64	7	.89	39	.83	36	.60	11	.82	14	.84	35	.56
	40	.69	35	.91	1	.90	20	.69	37	.68	1	.91	21	.62
	11	.68	18	.98	6	.96	28	.62	38	.69	24	.91	36	.69
	37	.90	27	1.04	37	.94	17	.72	1	.73	23	1.04	25	.62
	5	1.01	1	1.17	27	.91	32	.87	14	.84	18	1.08	17	.75
	6	.95	29	1.08	18	.94	21	.86	39	.94	31	1.09	29	.97
	9	1.14	14	1.11	23	1.06	19	1.01	15	.97	39	1.11	19	1.15
	27	1.14	39	.97	26	1.20	5	1.18	30	1.09	33	1.05	23	1.32
	38	1.12	3	1.02	17	1.09	23	1.20	9	1.00	22	1.14	13	1.50
	14	1.30	6	1.02	3	1.16	10	1.40	5	1.16	26	1.17	30	1.58
	26	1.31	24	1.06	29	1.30	38	1.35	6	1.06	38	1.20	24	1.70
	4	1.28	17	1.04	11	1.32	30	1.42	27	1.17	30	1.21	15	1.73
	18	1.32	25	1.20	22	1.31	24	1.53	24	1.20	34	1.12	18	1.73
	24	1.31	10	1.23	34	1.40	33	1.37	33	1.12	11	1.13	31	1.76
	34	1.41	34	1.21	31	1.40	31	1.33	23	1.22	9	1.15	33	1.60
	39	1.45	26	1.22	25	1.53	18	1.38	22	1.31	37	1.15	10	1.60
	33	1.47	15	1.33	30	1.46	6	1.41	31	1.26	40	1.28	3	1.62
	1	1.32	38	1.11	33	1.47	16	1.64	3	1.32	15	1.43	5	1.63
	15	1.48	30	1.11	38	1.38	13	1.39	7	1.26	7	1.24	6	1.71
	3	1.52	20	1.31	7	1.39	15	1.49	29	1.42	8	1.33	7	1.77
	30	1.53	21	1.32	40	1.51	22	1.61	10	1.49	16	1.38	12	1.80
	29	1.56	28	1.32	8	1.54	3	1.63	40	1.55	4	1.53	2	1.80
	12	1.44	31	1.37	5	1.60	39	1.63	8	1.55	17	1.56	38	1.83
	2	1.48	32	1.43	15	1.34	3	1.71	4	1.60	5	1.42	4	1.84
	13	1.54	2	1.50	19	1.48	7	1.60	16	1.61	10	1.57	27	1.86
	25	1.61	5	1.35	4	1.52	37	1.62	17	1.70	2	1.54	34	1.95
	7	1.64	37	1.41	35	1.53	12	1.63	36	1.76	29	1.64	16	1.96
	23	1.68	9	1.51	10	1.67	2	1.65	2	1.61	12	1.67	39	1.96
	21	1.77	11	1.65	28	1.70	4	1.66	12	1.74	21	1.64	1	1.97
	10	1.60	22	1.68	21	1.71	1	1.69	25	1.77	35	1.68	8	1.99
	19	1.62	40	1.78	20	1.74	34	1.70	35	1.80	25	1.71	40	1.99
	17	1.70	8	1.80	16	1.56	27	1.71	19	1.85	36	1.72	22	1.99
	35	1.91	19	1.44	36	1.57	40	1.74	13	1.89	13	1.75	37	2.04
	32	1.92	13	1.61	13	1.62	26	1.77	21	2.15	19	1.81	14	2.07
	36	1.95	4	1.63	2	1.63	14	1.81	28	2.15	32	1.84	9	2.09
	28	1.99	12	1.66	12	1.63	9	1.85	20	2.18	28	1.86	26	2.15
	20	2.13	16	1.84	32	1.82	11	1.85	32	2.28	20	1.95	11	2.25

TABLE XIV (Continued)

Target Painting	29		30		31		32		33		34		35	
	25	.53	34	.50	22	.64	21	.24	23	.75	30	.50	36	.15
	35	.72	3	.76	6	.69	28	.58	7	.74	26	.69	25	.54
	36	.70	15	.67	5	.80	20	.72	38	.89	15	.66	20	.51
	17	.63	33	.91	38	.77	35	.85	34	.94	18	.84	28	.56
	19	.96	26	1.09	11	.94	25	.87	30	.91	33	.94	29	.72
	20	.96	38	1.12	37	1.05	36	.97	5	.92	38	.95	23	.91
	28	.97	18	.97	16	.90	17	1.07	6	1.05	1	.87	17	.71
	23	1.08	5	1.10	8	1.04	13	1.25	10	.93	3	.91	32	.85
	5	1.09	27	1.21	27	1.09	19	1.06	27	1.05	37	1.07	21	.85
	18	1.06	1	1.08	40	1.09	29	1.26	2	1.24	5	1.10	19	1.15
	15	1.12	7	1.30	33	1.11	23	1.43	3	1.04	11	.99	33	1.24
	38	1.15	10	1.30	26	1.26	10	1.42	31	1.11	9	1.13	10	1.36
	10	1.30	37	1.33	18	1.17	33	1.55	18	1.15	27	1.12	30	1.38
	24	1.30	9	1.35	30	1.39	12	1.55	39	1.18	6	1.15	5	1.40
	30	1.23	6	1.22	24	1.40	2	1.56	15	1.26	14	1.20	18	1.42
	21	1.25	29	1.23	39	1.44	4	1.64	26	1.12	23	1.21	7	1.43
	6	1.36	36	1.37	9	1.49	7	1.64	36	1.21	39	1.30	15	1.54
	39	1.40	23	1.11	7	1.49	31	1.70	1	1.32	7	1.25	31	1.57
	1	1.42	11	1.30	1	1.28	16	1.79	21	1.41	10	1.36	38	1.47
	32	1.26	35	1.38	34	1.34	5	1.58	35	1.24	24	1.40	6	1.49
	26	1.42	31	1.39	29	1.37	3	1.67	37	1.43	31	1.34	3	1.50
	3	1.52	25	1.42	23	1.37	30	1.72	9	1.58	22	1.41	13	1.51
	33	1.31	14	1.44	14	1.38	6	1.77	29	1.31	40	1.45	24	1.53
	13	1.37	17	1.44	3	1.48	8	1.80	14	1.35	8	1.48	2	1.68
	31	1.37	24	1.46	25	1.33	40	1.80	25	1.37	17	1.67	34	1.68
	9	1.52	39	1.50	15	1.54	24	1.83	11	1.40	16	1.58	37	1.80
	14	1.53	22	1.53	35	1.57	27	1.84	22	1.47	29	1.42	39	1.62
	4	1.54	28	1.58	36	1.60	15	1.90	24	1.47	2	1.48	27	1.68
	12	1.54	20	1.61	10	1.49	22	1.92	12	1.48	4	1.51	1	1.72
	2	1.55	40	1.50	21	1.53	38	1.92	17	1.50	36	1.66	12	1.74
	22	1.56	4	1.52	17	1.60	18	1.97	19	1.57	35	1.68	4	1.78
	37	1.31	8	1.53	32	1.70	39	1.98	4	1.43	12	1.67	14	1.79
	34	1.42	16	1.62	28	1.76	34	2.07	32	1.55	25	1.70	26	1.80
	7	1.44	2	1.46	4	1.52	14	2.16	8	1.49	13	1.81	22	1.91
	11	1.63	21	1.58	2	1.57	9	2.17	13	1.54	19	1.82	16	1.95
	27	1.64	12	1.64	12	1.61	37	2.17	16	1.56	21	1.93	9	1.95
	8	1.67	19	1.66	19	1.64	1	2.18	20	1.64	28	1.95	8	1.97
	40	1.70	13	1.69	13	1.65	26	2.28	40	1.48	20	1.99	40	1.97
	16	1.64	32	1.72	20	1.88	11	2.28	28	1.60	32	2.07	11	2.06

TABLE XIV (Continued)

Target Painting	36		37		38		39		40	
	35	.15	11	.60	31	.77	14	.58	8	.12
	20	.62	18	.68	6	.82	24	.83	16	.38
	25	.60	1	.72	26	.69	7	.84	22	.69
	28	.69	9	.77	18	.71	26	.94	4	.78
	29	.70	26	.68	37	.82	37	1.05	12	.96
	23	.89	38	.82	33	.89	38	1.16	2	1.02
	17	.78	22	.90	5	.76	9	1.00	11	1.01
	32	.97	14	.79	34	.95	6	1.20	31	1.09
	21	.98	39	1.05	11	.92	27	1.11	5	1.07
	19	1.19	31	1.05	39	1.16	23	.97	9	1.15
	33	1.21	6	.91	1	.97	33	1.18	13	1.14
	30	1.37	24	.94	30	1.12	34	1.30	27	1.28
	10	1.34	34	1.07	15	1.20	4	1.33	6	1.37
	7	1.40	15	1.10	27	1.20	18	1.08	10	1.32
	5	1.39	16	1.26	22	1.12	1	1.18	7	1.48
	18	1.40	30	1.33	29	1.15	3	1.36	37	1.31
	38	1.43	27	1.15	14	1.16	17	1.40	34	1.45
	31	1.60	5	1.17	7	1.29	29	1.40	15	1.42
	6	1.52	8	1.29	23	1.11	12	1.40	3	1.43
	15	1.53	33	1.43	25	1.35	10	1.26	19	1.44
	13	1.55	40	1.31	10	1.38	2	1.31	38	1.48
	34	1.66	23	1.41	16	1.40	11	1.33	24	1.51
	2	1.70	3	1.44	3	1.44	15	1.33	1	1.65
	1	1.72	17	1.52	8	1.44	31	1.44	30	1.50
	26	1.76	7	1.54	17	1.54	22	1.45	14	1.52
	3	1.55	29	1.31	24	1.34	19	1.46	26	1.55
	24	1.57	10	1.67	9	1.37	30	1.50	18	1.65
	39	1.60	19	1.68	36	1.43	13	1.49	29	1.70
	27	1.72	13	1.77	40	1.48	16	1.64	23	1.78
	12	1.77	35	1.80	35	1.47	25	1.69	33	1.48
	14	1.80	4	1.52	19	1.69	5	1.41	39	1.54
	37	1.80	25	1.62	2	1.61	40	1.54	21	1.67
	4	1.81	2	1.67	4	1.63	8	1.56	25	1.74
	22	1.95	12	1.68	12	1.72	36	1.60	17	1.77
	9	1.97	36	1.80	13	1.79	35	1.62	32	1.80
	16	2.00	28	2.04	21	1.79	21	1.89	35	1.97
	8	2.01	21	2.04	28	1.83	28	1.96	28	1.99
	40	2.02	20	2.10	20	1.88	20	1.97	36	2.02
	11	2.06	32	2.17	32	1.92	32	1.98	20	2.13

a. Distances are given in the order yielded by the computer program with paintings appearing in a sequence which approximately parallels their distance from the target painting.