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Mixing of musical and visual stimuli in television: A study of channel dominance and compatibility.

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MIXING OF MUSICAL AND VISUAL STIMULI IN TELEVISION: A STUDY OF CHANNEL DOMINANCE AND COMPATIBILITY

by

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Abstract

Two hundred and forty first year psychology students viewed 25 two minute exerpts of video tapes of sporting events, accompanied by music. Both musical and visual stimuli were chosen on the basis of perceived violence level from a set of stimuli which had been operationally defined in pretesting using the semantic differential. These ratings were made by 29 subjects similar to those used in the actual experiment. Violent and non-violent audio and video tracks were placed in all possible combinations. It was hypothesized that one channel or the other would dominate peoples' perception of the stimuli; that is that the two would not have equal effects. It was also hypothesized that when both channels were violent or both were non-violent, such compatible combinations would have a greater effect than non-compatible combinations. Results based on ANOVA comparisons of semantic differential scores showed a clear dominance of visual over auditory channels. No clear support for the effect of inter channel compatibility were found.

Acknowledgments

I would like to first dedicate this volume to my mother for her unwavering love and support during the long and often meandering course of my academic career. There are some debts which can never be repayed and this, obviously, is one of them. I only hope that my post-academic career can in some way justify her faith in me. I also dedicate this to the memory of my father who is not here to share this achievement.

I must of course acknowledge the friends and mentors whose support and guidance has helped me to be who and where I am today. Any attempt to name them all would necessarily mean the exclusion of some deserving of mention. They know who they are. I would like to thank Dr. William Libby for providing the guidance I needed during this endeavor. He helped make an average study more than that. Also I would thank Paul Kelly for his friendship and advice. Finally, thanks to Alice Buchanan for providing support and direction when it was needed.

John B. Schmelefske

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CHAPTER 1

INTRODUCTION

There is an area of mixed media study which has thus far been largely neglected. This area involves the mixing of musical and visual components. The use of musical tracks to effect the emotional tone of visual material is common practice in both film and television media. The present investigation is intended to explore the effect of musical-visual mixing on the viewer's experience. How will such mixing affect the viewer's perception of connotative or emotional content? This is a phenomenon that most directors take for granted. The musical score is chosen to magnify and extend the emotional qualities of the visual image. The intent of this study is to bring this assumption under scientific scrutiny. Its scope will be limited to television.

There are two categories of research literature which are of direct relevance to the present study. The first consists of studies concerned with the relative contributions of audio and visual components of the media. Such studies generally tend to focus on the effects of media mixing on learning. In most cases the audio element has been restricted to verbal language exclusively. The second group of studies are those dealing with experimental aesthetics and more particularly the study of music.

Let's begin with the first category involving audio-visual research. A wide variety of research has been done to determine

the effects of different media components. However, since the present study is limited to the emotional or connotative effects of television, the discussion will be limited to studies that are of direct or indirect relevance to emotional or connotative rather that cognitive processes.

Perhaps the most simple and straight-forward of these was an attempt by Le Roy, Uram and Wenmouth to discover which of the audio or visual portions of a newscast were more reinforcing (Le Roy et al., 1974). Two groups of subjects viewed a newscast in which the audio or visual component, depending on the group, would shut off every 2.5 seconds. To reinstate the missing element the subject was required to depress a lever. The number of bar presses provided an accurate measure of how rewarding each component was. Results indicated that viewers rely much more heavily on the auditory than the visual channel. This study indicates a tendency for the verbal mode to assume the position of primary source of communication. It would be interesting to speculate as to which element would dominate if music rather than words had been the primary component of the auditory channel.

Also of interest are two papers by Nelson and Moll (Nelson & Moll, 1951, and Nelson, 1953). In the first study, Nelson and Moll utilized as stimuli three short films: Theory of Flight, Problems of Flight, and Land and Live in the Desert. Subjects viewed either the complete film, the sound track only or the visual track only. Subjects were then tested to determine how much they had learned. Results indicated that while the visual or

auditory components alone produced significant learning, their effect in combination was greater still. Also the audio portion induced significantly more learning than the visual in two of the three cases, but neither the audio or visual had as much effect as the combined presentations. This again supports the contention of verbal dominance, but also shows that the visual element provides a secondary contribution. While this study concerns itself primarily with knowledge acquisition, it is important to the present study in that it indicates again a general tendency to rely more heavily on the verbal mode as a primary information source.

In the second paper by Nelson (Nelson, 1953) he points out that the learning effect of the auditory and visual modes are not additive. That is, depending on the nature of the two, whether they are redundant, complementary or contradictory, their combined effect may be more than, less than or equal to the simple additive effect of the two in isolation.

A more recent study by Dommermuth attempted to explore McLuhan's distinction between hot and cool media. In this experiment each of four groups was presented the same filmed lecture in a different way: "Group One saw and heard the lecture on television. Group Two saw and heard the film as a motion picture. Group Three heard the sound track simulating a radio presentation. Group Four read the script in print form" (Dommermuth, 1974, p. 443). While this study failed to produce any significant differences between television, which includes both sight and sound, and radio, which relies on sound only, it is still relevant to the present study in two ways.

Firstly, by using the semantic differential as its chief means of measurement it stresses connotative, emotional aspects of the media rather than more cognitive elements. By utilizing a set of 13 polar adjectives aimed at measuring "potency", "activity" and "evaluation" this study differs from those previously mentioned which stressed rote memory. Rather than focus on knowledge acquisition it stresses more subtle emotional elements which operate at a lower level of awareness.

Secondly, it is important to point out that while this technique failed to distinguish adequately between audio-visual and pure audio presentation, this does not mean that it could not do so under different circumstances. This method was able to distinguish other media such as motion picture and print in the same experiment. Also remember Nelson's comment that the summated effect of the auditory and visual channels varies greatly depending on whether they are complimentary, redundant or contradictory. In this case the stimulus used was a lecture delivered by a college professor. The ability of the visual component to add to the emotional effect will depend greatly on the lecturer's ability to communicate non-verbally. The professor was advocating the view that education should primarily be aimed at "intellectual discipline". It is doubtful that such circumstances would allow the visual component to have much of an effect, either positive or negative, unless the speaker were highly skilled in non-verbal communication. These comments are also interesting with respect to the next mentioned study.

A more recent and promising study of media specific learning

effects is that of Reinhard Helmreich (Helmreich, 1976). Helmreich attempted to compare both cognitive and emotional learning effects of two media, radio and television. The presentational material was a five member group discussion concerning "Life and Work in Australia". One group only heard the discussion. The other both saw and heard it on television. The Bales method of analysing and recording social interaction was used to derive a 93 item questionnaire which measured knowlege retention. A nine dimension version of Osgood's semantic differential was used to measure emotional impression. Time of questioning was also used as a variable, but produced no significant results.

The questionnaire results indicated that the volume of knowledge acquired was the same for both the radio and television recipients. Emotional impressions, however, as measured by the semantic differential technique produced a definite distinction between the radio and television groups. Radio listeners found the program more exciting, more agreeable and more powerful than the television viewers. Thus, Helmreich was able to demonstrate media-specific emotional impressions, which were present in spite of no appreciable difference in knowledge transmission.

The most striking finding is that the emotional response of radio listeners was apparently greater than that of television viewers. These results might be used as evidence for or against the McLuhan "hot" - "cool" distinction but a more appealing explanation comes from Nelson's media-mix compatibility hypothesis (Nelson, 1953). Perhaps the visual component failed to enhance the effect of the presentation because it wasn't compatible with

what was being said. The verbal component involved a specific subject area, "Life and Work in Australia". It is questionable that the ability to see the group members could contribute to one's emotional understanding of Australia. In fact, the inclusion of non-verbal interpersonal variables may have a negative effect. More than merely being irrelevant they might serve to distract from or contradict the main message. The Nelson et al. findings proved that content compatibility can in fact enhance effects at the level of knowledge retention. That Helmreich's study produced no knowledge acquisition disparities may indicate a failure to account for this. If such speculation is correct then one would assume that making audio and visual components more compatible might enable one to reverse the Helmreich findings at the emotional level.

Another study which seems to have more adequately accounted for compatibility and employed music in the audio channel, is Tannenbaum's study involving theatrical performance (Tannenbaum, 1956). Tannenbaum had subjects view a play under three conditions. The first involved viewing a live performance of the play on stage. For the second condition, the play was video taped on stage using a single camera without employing complicated production techniques. The third version was a video tape created in the studio using more than one camera and employing the tools of modern television production such as varied camera angles, editing and lighting. The play was described as "tense" and "bold" with a "high dramatic impact". The aspect of this study most relevant to the present study, however, was the use of musical background accompaniment.

All three versions of the play were presented both with and without background music. The music was considered by a panel of four experts to be appropriate to the emotional tone of the play. Clearly more allowance was made for compatability between the auditory components and the visual components.

Using the semantic differential as his measuring tool, Tannenbaum found that although an evaluative factor was not affected by the presence or absence of music, both perceived potency and activity were enhanced by the presence of music. This would appear to provide evidence that music will, in fact, increase the impact of an audio-visual presentation. One factor which must be considered here, however, is that three modes of communication were actually involved. Not only the musical and visual elements were presented but also the verbalizations of the actors. Evidence has already been presented that verbal information tends to dominate in audio-visual presentations. The presence of both verbal and visual components confuses the interpretation of the results since it is impossible to tell whether it is the effect of the spoken word, the visual array, or both which is being enhanced. The present study avoids this confusion by limiting itself to only musical and visual elements.

Having completed a review of audio-visually oriented research it is now necessary to deal with the second relevant area concerned with experimental aesthetics and the study of music. The earliest productive attempts to develop a systematic means of describing various musical pieces verbally date to Hevner's utilization of adjective checklists (Hevner, 1953). These checklists consisted

of adjectives representing various feeling responses. The adjectives were clustered into eight moods. Hevner found remarkable agreement among subjects as long as the piece contained no radical shifts in structure. The checklist was later revised by Farnsworth to enhance its consistency (Farnsworth, 1954). Hevner later used the checklist to show that slow tempos tend to elicit dignified, calm, serene, sentimental, tender or sad groups of adjectives. Fast tempos, on the other hand, elicit happy, gay, exciting, or restless groups (Hevner, 1937).

More recent studies have adopted the method of plotting different aesthetic stimuli in semantic space. This involves the use of the same semantic differential technique utilized in previously mentioned studies of mixed media. Wedin reports using this technique to derive three bipolar dimensions which account for a significant portion of subjective musical experience (Wedin, 1972). These "perceptual-emotional qualities" are; Tension-Energy, Gaiety-Gloom, and Solemnity-Triviality. Subjects were able to categorize a wide variety of musical stimuli within these dimensions.

Berlyne has used a similar technique to analyze exotic and western pre-Rennaissance art (Berlyne, 1975). He developed a three factor affective system involving Hedonic Tone, Arousal and Uncertainty. These he corresponds roughly to Osgood's Evaluative, Potency and Activity factors (Osgood and Suci, 1955; Osgood, 1952). Berlyne obtained promising validation for his approach by deriving significant correlations with measures of similarity, looking time and preference.

Albert has used the same technique to study different factors

in the perception of classical (Albert, 1976) and rock (Albert, 1977) music. In the first case such variables as musical intensity, musical training, sex, and an "environmental factor" were found, in varying degree, to have consistent effects on musical perception. In the second study Albert found that, with respect to rock music, both "musical intensity" and "lyrical violence level" contributed to perceived violence. Passages of high musical intensity (fast tempo and loud dynamic range) were perceived as more disturbing, ugly and disorderly than those of low intensity. Passages containing a high degree of lyrical violence were seen as more disturbing, disorderly and ugly than those of low lyrical violence. Albert also discovered a tendency for passages of low musical intensity and high lyrical violence to be seen as more disturbing, ugly and disorderly than passages of high musical intensity and lyrical violence, suggesting that the perception of beauty or order is more influenced by words than musical intensity (Albert, 1977). Albert concluded that the presence of a strong musical intensity by lyrical violence interaction supports his contention that there is more to rock than simplistic musical structures. We are again reminded of Nelson's belief in the importance of compatibility of content between mixed media. In the same way that verbal and visual modes are not merely additive in effect, so the results of combining words and music will have an enhancing or detracting effect depending on the nature of the match between the two.

To summarize the important aspects of what has been covered, it seems firstly, that there is evidence to support the dominance

of the verbal mode in television (Le Roy et al., 1974; Nelson and Moll, 1951; Helmreich, 1976). These studies demonstrated a greater strength in words over the visual element in transmitting both cognitive and emotional information. The power of words was also demonstrated in Albert's study of rock music where highly violent lyrics, in conjunction with music of low intensity, had pronounced effects on perceived order or beauty (Albert, 1977).

A second point worth noting is the failure of previous media researchers to account for media compatability when investigating affective or connotative information. While Nelson proved rather conclusively that compatability is important for cognitive learning, this lesson has not been transferred to studies focusing on connotative meaning.

Finally there is apparently considerable support for the use of the semantic differential technique in studies concerning both media analysis and experimental aesthetics. For this reason, the technique was adopted as a satisfactory dependent measure in the present study.

Clearly, evidence from earlier studies indicates a tendency in mixed-media for one channel to dominate. Thus, the first major research hypothesis was based on the expectancy that one channel, audio or video, would become the dominant source of experiential information for the viewer.

A second major research hypothesis involved the issue of compatability. The intention here was to focus on the use of music as an enhancing element in audio-visual mixing. The problem was to demonstrate whether music and video elements, when combined, will create a greater impression than either element shown in

isolation. If such were the case, significant interactions should occur.

Obviously, some means of selecting compatible and incompatible stimuli was needed. It was hoped that by pretesting several musical and video stimuli using semantic differential scaling, a pool of operationally defined stimuli could be created. From this pool of stimuli, those which characterized opposite extremes on the same dimension could be chosen. They might, for example, represent extremes on an active-passive dimension. Thus, a piece of music could be paired with a visual stimulus which represented the opposite extreme. These two cases would represent compatible and incompatible combinations respectively.

In addition, it was hoped that by testing each stimulus in isolation, as well as in combination with others, the cummulative effects of such combinations could be observed. For example, would music add anything to the overall effect of video presentation?

CHAPTER II

PRETEST METHOD

Subjects

Twenty-nine subjects were chosen from a Psychology 115 undergraduate course. The incentive for involvement was experimental points which could be used to increase the students' grade. There were 14 males and 15 females between 18 and 25 years old.

Procedure

Ten musical and eleven video stimuli were selected by the experimenter. Each of the 21 stimuli was approximately 2 minutes in duration. Slight variations of no more than 10 seconds were allowed in order that each selection be cut off at a logical point rather than abruptly. The ten musical stimuli were all purely instrumental rock pieces with an accent on electric guitar. They were excerpts from: Scatterbrain, Jeff Beck; Cortez the Killer, Neil Young; Song of the Wind, Santana; Thelonias, Jeff Beck; 21st Century Schizoid Man, King Crimson; Cause We Ended as Lovers, Jeff Beck; A Love Supreme, Santana; Diamond Dust, Jeff Beck; From Ocean to Clouds, Al Di Meola; and Welcome, Santana. They were chosen for both consistency of instrumentation and variation in apparent violence of mood. An attempt was made to choose more obscure pieces in order to partially eliminate familiarity effects.

The eleven sporting events were also chosen for their div-

ersity. These excerpts were from the following sporting events; motocross, football, boxing, golf, wrestling, hockey, slalom skiing, curling, figure skating, basketball, and downhill skiing. It was less possible in this case to cope with familiarity since obscure sports are hard to define or obtain. Stimuli were selected from a pool of several hours of televised sporting events viewed over a period of several months. With both musical and visual stimuli an attempt was made to choose examples which maintained a consistent violent or non-violent mood throughout. For example, with boxing a consistently active round was chosen over one which built slowly to a climactic knock-out.

Subjects were divided into two groups of 15 (in one of the groups a single subject failed to come). Since the experiment required a high level of concentration on many stimuli, it was decided to run each gorup in two one hour sessions rather than one longer session. Group one saw the visual stimuli in the first session and then the musical stimuli one week later. The second group heard the musical stimuli during the first sitting and saw the visual stimuli in the second. The order of stimuli <u>within</u> stimulus type was also reversed for this group. Thus, the first musical stimulus for the first group was the last for the second group and the last stimulus became the first. In this way counterbalancing occurred both between types and within types of stimulus.

Subjects either heard the musical stimuli on a reel to reel recorder or saw the visual stimuli (with no audio) on the colour

television monitor.

A set of 23 bipolar semantic differential scales were chosen from those used by other experimenters mentioned earlier (Albert, 1976; Berlyne, 1975; Dommermuth, 1974; Helmreich, 1976 and Wedin, 1972). An attempt was made to choose only those which were suitable for both auditory and visual stimuli. They were: orderly-chaotic, calming-exciting, drowsy-alert, relaxed-tense, good-bad, clear-indefinite, ugly-beautiful, slow-fast, happy-sad, dark-bright, simple-complex, familiar-unfamiliar, soothing-disturbing, weak-powerful, comfortable-uncomfortable, passive-active, cruel-kind, light-heavy, smooth-rough, sweet-sour, placid-vigorous, serious-humorous, and peaceful-violent.

Each subject received a set of instructions at the beginning of each session explaining how the scales were to be used (see Appendix). At the end of the second session each subject completed a questionaire concerning attitudes towards music or television and preferences in programming (see Appendix). This was used primarily as a measure of possible sample biases and as a test for future use.

The data was analysed using the SPSS program for principle components factor analysis, and a varimax rotation was performed. This was applied to the musical and visual stimuli separately.

CHAPTER III

PRETEST RESULTS

Each of the 29 subjects scored 23 scales for each stimulus they saw. The raw scores for all 11 sport stimuli were subjected to SPSS principle components factor analysis. The varimax rotated factor matrix appears on table I. Three major factors were extracted. The first, labelled Evaluative, accounted for 38.3% of the variance. It was characterized by scales such as ugly-beautiful, good-bad, comfortable-uncomfortable, happy-sad, and sweet-sour. The second factor, labelled Dynamism, accounted for 25.7% of the variance and was characterized by scales such as passive-active, placid-vigorous, calming-exciting, weak-powerful and drowsy-alert. The third factor, labelled Clarity, accounted for 4.5% of the variance. It was characterized by such scales as familiar-unfamiliar, simple-complex and clear-indefinite.

The raw scores for all 10 musical stimuli were subjected to the same analysis, and the resultant factor matrix appears on table II. Again, three factors were extracted. The first, labelled Dynamism, accounted for 49.3% of the variance. It was characterized by such scales as placid-vigorous, drowsy-alert, passive-active, slow-fast, and calming-exciting. The second factor, labelled Evaluative, accounted for 16.3% of the variance, and was characterized by such scales as good-bad, comfortable-uncomfortable, ugly-beautiful, soothing-disturbing and sweet-sour.

TABLE I

PRE-TEST FACTOR LOADINGS FOR SPORTS

	SCALES	(Evaluative) FACTOR 1	(Dynamism) FACTOR 2	(Clarity) FACTOR 3
1.	Orderly-Chaotic	.66+	.42	.13
2.	Calming-Exciting	-.04	.85+	.09
3.	Drowsy-Alert	-.21	.80+	.06
4.	Relaxed-Tense	.27	.73+	.05
5.	Good-Bad	.85+	-.12	.05
6.	Clear-Indefinite	.73+	-.01	.25
7.	Ugly-Beautiful	-.89+	-.02	.09
8.	Slow-Fast	-.16	.78+	.15
9.	Happy-Sad	.83+	.00	-.09
10.	Dark-Bright	-.77+	.08	.17
11.	Simple-Complex	-.36	.31	.58+
12.	Familiar-Unfamiliar	.43	-.30	.58+
13.	Soothing-Disturbing	.81+	.28	.03
14.	Weak-Powerful	-.07	.83+	-.01
15.	Comfortable-Uncomfortable	.85+	.00	.10
16.	Passive-Active	-.04	.87+	-.03
17.	Cruel-Kind	-.62	-.55	.18
18.	Light-Heavy	.44	.63+	-.20
19.	Smooth-Rough	.53	.65	-.16
20.	Sweet-Sour	.81+	.23	-.13
21.	Placid-Vigourous	.11	.85+	-.06
22.	Serious-Humourous	.50	-.25	-.12
23.	Peaceful-Violent	.52	.67	-.20
	% variance	38.30	25.70	4.50

+ indicates scales which load on factors

TABLE II

PRE-TEST FACTOR LOADINGS FOR MUSIC

	SCALES	(Dynamism) FACTOR 1	(Evaluative) FACTOR 2	(Sobriety) FACTOR 3
1.	Orderly-Chaotic	.40	.70 +	.15
2.	Calming-Exciting	.82 +	.22	.22
3.	Drowsy-Alert	.86 +	.16	.27
4.	Relaxed-Tense	.68	.56	.10
5.	Good-Bad	.12	.83 +	-.04
6.	Clear-Indefinite	.21	.70 +	.13
7.	Ugly-Beautiful	-.25	-.77 +	.15
8.	Slow-Fast	.83 +	.30	.27
9.	Happy-Sad	-.50	.30	-.58
10.	Dark-Bright	.37	-.43	.61 +
11.	Simple-Complex	.66 +	.14	.16
12.	Familiar-Unfamiliar	-.11	.67 +	.06
13.	Soothing-Disturbing	.41	.77 +	.01
14.	Weak-Powerful	.78 +	.00	.01
15.	Comfortable-Uncomfortable	.29	.80 +	-.02
16.	Passive-Active	.84 +	.18	.21
17.	Cruel-Kind	-.61	-.42	.29
18.	Light-Heavy	.75 +	.31	-.25
19.	Smooth-Rough	.65	.57	-.03
20.	Sweet-Sour	.38	.75 +	-.12
21.	Placid-Vigorous	.86 +	.23	.14
22.	Serious-Humorous	.06	.29	.73 +
23.	Peaceful-Violent	.78 +	.41	-.00
	% variance	49.30	16.30	5.60

+ indicates scales which load on factors

The third factor, labelled Sobriety, accounted for 5.6% of the variance. It was characterized by such scales as serious-humorous, dark-bright, and happy-sad.

It is clear that factor I, derived from the musical stimuli, and factor II from the sport stimuli involve the same scales and are essentially equivalent. For this reason, they have both been labelled Dynamism. Similarly, musical factor II and sport factor I are composed of the same scales and have both been named Evaluative.

The next stage in the analysis was to obtain the factor scores of all subjects on each of the different stimuli. The mean factor score for each stimulus on each factor provides an indicator of how that stimulus has been evaluated with respect to that factor. The higher scores, in either a positive or negative direction, represent extreme scores on the bipolar dimension making up a factor -- negative and positive expressing opposite extremes. The mean factor scores for each stimulus are presented in tables III and IV. Scores were tabulated for each of the three factors. For example, among the musical stimuli, "A Love Supreme" had a mean factor score of .62. This was the highest positive score on that factor and indicates that it was seen as the most vigorous, alert, active, etc. Conversely, "Diamond Dust" received the highest negative score, and was thus seen as most placid, drowsy, passive etc.

It now becomes possible, using this information, to operationally define the stimuli to be chosen for the study. The Dynamism factor was chosen as a criterion for selecting stimuli. This was partly a reflection of the general tendency in the field of media

TABLES III and IV

PRE-TEST FACTOR SCORES FOR MUSIC AND SPORTS

	MUSIC	(Dynamism) FACTOR 1	(Evaluative) FACTOR 2	(Sobriety) FACTOR 3
1.	Scatterbrain	.07	-.30	.37
2.	Cortez the Killer	-.03	-.28	-.41
3.	Song of the Wind	-.40 +	-.32	.48
4.	Thelonius	.60 +	.34	-.02
5.	21st Century Schizoid Man	-.04	.27	-.33
6.	Cause We Ended as Lovers	.00	.11	-.51
7.	A Love Supreme	.62 +	.37	-.03
8.	Diamond Dust	-.49 +	-.38	.18
9.	From Ocean to Clouds	-.19	.03	.01
10.	Welcome	-.13	.15	.26

	SPORT	(Evaluative) FACTOR 1	(Dynamism) FACTOR 2	(Sobriety) FACTOR 3
1.	Motorcross	-.47	.51	.28
2.	Football	-.07	.60 +	-.23
3.	Boxing	-.11	-.20	-.03
4.	Golf	-.12	-1.22 +	-.24
5.	Wrestling	.56	.18	.11
6.	Hockey	-.10	.89 +	-.05
7.	Slalom skiing	.53	.06	-.20
8.	Curling	-.04	-1.56 +	-.03
9.	Figure skating	-.01	-.36	-.03
10.	Basketball	-.04	.55	.08
11.	Downhill skiing	-.09	.49	.35

+ indicates extreme scores on Dynamism

study to focus on those aspects of media which involve violence. This tendency is of course a reflection of the growing social concern with the effects of such violence upon the viewer. It was thus felt that the Dynamism factor would provide information more generalizable to other work being done in this field. There were, however, other aspects of the data itself which suggest that this was a wise choice. Firstly, it is clear from observing the mean factor scores that stimuli were more clearly differentiated by the Dynamism factor, ie. for both musical and sport stimuli the scores were more extreme. Secondly, the Evaluative factor, as its very name implies, is more open to personal opinion. The scales which load on this factor (good-bad, ugly-beautiful) are more value laden than those in the Dynamism factor. Thus, results obtained using the Dynamism factor might be more generalizable beyond the specific sample used.

The two highest scores at each extreme of the Dynamism factor were used as a criterion for choosing stimuli for the final phase of the experiment. Two were chosen in order to ensure that a given pole on a dimension be accurately reflected. It was felt that using only one extreme score would make the results less generalizable.

From the musical stimuli, "A Love Supreme" and "Thelonius", with mean factor scores of .62 and .60 respectively, were chosen. These reflect the vigorous, alert, active, fast, exciting aspect. "Diamond Dust" and "Song of the Wind", with mean factor scores of -.49 and -.40, were selected to reflect the placid, drowsy, passive, slow, calming aspect. From the sport stimuli, hockey and football,

with mean factor scores of .89 and .60, were chosen to reflect the active, vigorous, exciting, powerful, alert aspect. Curling and golf, with mean factor scores of -1.56 and -1.22, were chosen to reflect the passive, placid, calming, weak, drowsy aspect. Having thus chosen the necessary stimuli, the stage was set for the final phase of the experiment.

CHAPTER IV

METHOD

Subjects:

Two hundred and forty subjects were chosen from a first year Psychology 115 course. Again, the incentive for involvement was experimental points which could be used to increase the individual student's grade. Half the subjects were males and half female, between 18 and 25 years of age.

Procedure:

The four musical stimuli chosen for the experiment were "Song of the Wind" (M_1), "Diamond Dust" (M_2), "Thelonius" (M_3) and "A Love Supreme" (M_4). The four sport stimuli chosen were football (S_1), hockey (S_2), curling (S_3) and golf (S_4). The visual style employed in shooting the sport sequences should be mentioned. The average shot length for hockey and football was 17.1 seconds. For golf and curling it was 11.3 seconds. For all classes of stimuli the cuts between shots were direct. Also, all the sequences involved high angle shots and long shots. In hockey and football the camera was panning through all the shots. This tendency to move the camera to follow the action was not as prevalent with golf and curling where more still shots were used. All the shots for all the stimuli used a great depth of focus with the whole picture plane in focus. Two additional conditions where either music or sport were not present were also used. These were labelled M_0 and S_0 respectively. Under these conditions either the audio or video channel was left empty. There was

either silence on the auditory channel or a blank screen on the video channel. The ten stimuli were combined in all possible combinations producing a 5X5 factorial design with twenty-five individual cells. One cell, resulting from the combination of M_0 and S_0, was of course meaningless and was not utilized in the experiment. A pictorial representation of the design is presented in figure 1.

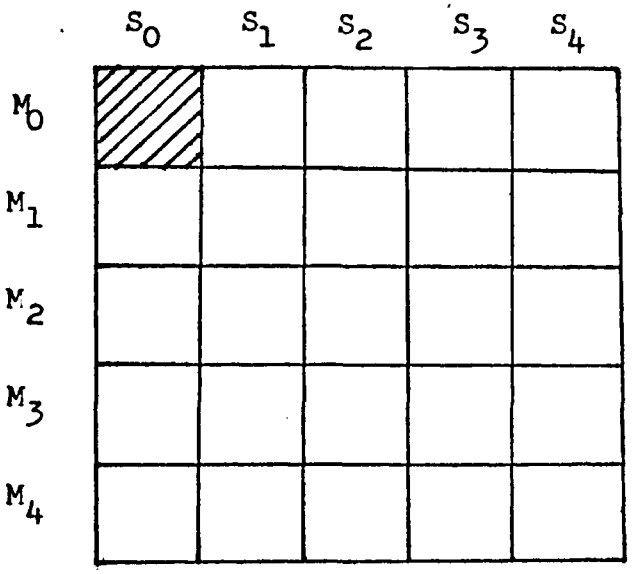
Ten subjects were grouped in each cell. The cells were balanced evenly by sex with five males and five females being randomly placed in each. The experiment was run over the winter term between October and April of the 1978-1979 school year. Each group viewed and evaluated only one of the twenty-four possible stimuli. The number of subjects run in each session varied from two to six.

When each group was ready the experimenter would hand out a set of instructions and a sheet of 23 semantic differential scales the same as those used in pretesting (see Appendix). Once all subjects were finished reading the instructions, they were asked to relax and quietly attend so that once the presentation was over they could use the scales to describe the experience. The lights were then dimmed and the presentation began. Each presentation lasted approximately two minutes. When questions arose concerning the instructions, subjects were simply asked to rely on their own judgment. The video stimuli were presented on a 24 inch colour television monitor. Music was dubbed onto the video tape and played through the television speaker. Where music was absent the speakers remained silent. Where sport was absent the screen was left blank.

When the presentation was over the lights were turned up and

FIGURE I

5X5 Factorial Design (Music X Sport) With One Irrelevant Cell



subjects were asked to use the scales to describe the experience. Once all scales were completed and handed in, experimental credit cards were given out and the experimenter briefly described the purpose and design of the experiment.

The experiment produced 240 sets of scored semantic differential scales. These were divided into 24 groups of 10, one for each stimulus. They provided the raw data for subsequent analyses.

CHAPTER V

RESULTS

The first factor analysis was performed on only the data from stimuli where both musical and video elements were present. This involved the 4X4 factorial design. An SPSS principal components factor analysis extracted five factors. The varimax rotated factor matrix for the three most significant factors appears in table V. The first factor accounted for 28.4% of the variance and was characterized by such scales as calm-exciting, vigorous-placid, active-passive, fast-slow and weak-powerful. This was clearly a reproduction of the Dynamism factor and was labelled accordingly. The second factor accounted for 16.7% of the variance and was characterized by the scales dark-bright, violent-peaceful, orderly-chaotic, rough-smooth, and cruel-kind. It was labelled Harmony. The third factor accounted for 6.9% of the variance and was characterized by such scales as happy-sad, good-bad, comfortable-uncomfortable, ugly-beautiful and sour-sweet. This was clearly another representation of the Evaluative factor.

The second factor analysis involved the addition of the 4 video stimuli with no musical accompaniment to the 4X4 design. Thus, the data was derived from a 5X4 factorial design. The varimax rotated factor matrix is presented in table VI. The results were essentially the same except that the second and third fac-

TABLE V

FACTOR LOADINGS DERIVED FROM 4 x 4 FACTORIAL DESIGN

	SCALES	(Dynamism) FACTOR 1	(Harmony) FACTOR 2	(Evaluative) FACTOR 3
1.	Uncomfortable-Comfortable	-.02	.07	.66 +
2.	Unfamiliar-Familiar	-.15	-.12	.09
3.	Sour-Sweet	.15	-.15	.60 +
4.	Heavy-Light	.55	.10	.24
5.	Indefinite-Clear	-.03	.22	.19
6.	Alert-Drowsy	.59 +	-.31	-.16
7.	Orderly-Chaotic	-.21	-.64 +	-.11
8.	Rough-Smooth	.47	.54	.13
9.	Good-Bad	.17	-.22	-.70 +
10.	Complex-Simple	.36	.38	.10
11.	Cruel-Kind	.45	.51	.30
12.	Violent-Peaceful	.53	.64 +	.14
13.	Dark-Bright	.00	.67 +	.23
14.	Soothing-Disturbing	.31	-.33	-.54
15.	Ugly-Beautiful	.00	.44	.62 +
16.	Active-Passive	.73 +	-.05	-.15
17.	Calm-Exciting	-.80 +	-.11	-.00
18.	Vigorous-Placid	.79 +	.29	-.06
19.	Fast-Slow	.73 +	.39	-.04
20.	Tense-Relaxed	.57	.26	.28
21.	Weak-Powerful	-.71 +	-.29	.08
22.	Happy-Sad	.15	-.12	-.74 +
23.	Humourous-Serious	-.02	.18	-.03
	% of Variance	28.40	16.70	6.90

+ indicates scales which load on factors

TABLE VI

FACTOR LOADINGS DERIVED FROM 5 x 4 FACTORIAL DESIGN
(4 Video - no Music Samples Added)

	SCALES	(Dynamism) FACTOR 1	(Evaluative) FACTOR 2	(Harmony) FACTOR 3
1.	Uncomfortable-Comfortable	-.03	.66 +	.05
2.	Unfamiliar-Familiar	-.16	.06	-.13
3.	Sour-Sweet	.14	.52	-.15
4.	Heavy-Light	.60 +	.27	.03
5.	Indefinite-Clear	.02	.18	.22
6.	Alert-Drowsy	.57 +	-.14	-.34
7.	Orderly-Chaotic	-.27	-.10	-.64 +
8.	Rough-Smooth	.53	.13	.52
9.	Good-Bad	.17	-.69 +	-.20
10.	Complex-Simple	.45	.15	.24
11.	Cruel-Kind	.46	.36	.44
12.	Violent-Peaceful	.59	.19	.58
13.	Dark-Bright	.07	.30	.64 +
14.	Soothing-Disturbing	-.34	-.62 +	-.24
15.	Ugly-Beautiful	.03	.65 +	.40
16.	Active-Passive	.71 +	-.21	-.03
17.	Calm-Exciting	-.78 +	-.03	-.04
18.	Vigorous-Placid	.81 +	-.04	.24
19.	Fast-Slow	.75 +	-.07	.36
20.	Tense-Relaxed	.58	.35	.21
21.	Weak-Powerful	-.74 +	.04	-.20
22.	Happy-Sad	.09	-.76 +	-.06
23.	Humourous-Serious	-.01	.05	.19
	% of Variance	28.80	16.70	7.00

+ indicates scales which load on factors

tors reversed in order of importance. The proportion of variance accounted for were; Dynamism, 28.8%, Evaluative, 16.7% and Harmony, 7.0%.

In the third factor analysis the 4 musical stimuli with no video were added to the 4X4 design producing a 4X5 factorial design. The varimax rotated factor matrix is presented in table VII. The factors are pretty well identical to those in the second factor analysis. The porportions of variance accounted for by each factor were; Dynamism, 30.0%, Evaluative, 17.0% and Harmony, 6.3%.

Factor scores were derived from all three factor analyses. These represented how strongly each subject had rated a stimulus with respect to a factor. They were used as raw data for subsequent ANOVA.

Table VIII presents the mean scores for each stimulus used in a nested ANOVA based on the 4X4 factorial design. Mean raw scores were computed for each of the scales contributing to a particular factor. Mean factor scores on each factor as a whole are also shown. The stimuli are divided under the two superordinate factors underwhich they were nested. Thus, two of each stimulus type are subsumed under either High or Low Dynamism as operationally defined in pretesting. For example, M_1 and M_2 represent low dynamism and M_3 and M_4 represent high dynamism. For those stimuli which were successfully discriminated at the level of high versus low dynamism, one or two asterisks are used to indicate the level of significance.

At the factor level Duncan multiple range tests were applied

TABLE VII

FACTOR LOADINGS DERIVED FROM 4 x 5 FACTORIAL DESIGN
(4 Music - no Video Samples Added)

	SCALES	(Dynamism) FACTOR 1	(Evaluative) FACTOR 2	(Harmony) FACTOR 3
1.	Uncomfortable-Comfortable	.01	.75 +	.08
2.	Unfamiliar-Familiar	-.16	.19	-.06
3.	Sour-Sweet	.13	.63 +	-.09
4.	Heavy-Light	.57 +	.29	.10
5.	Indefinite-Clear	-.04	.38	.26
6.	Alert-Drowsy	.58 +	-.12	-.42
7.	Orderly-Chaotic	-.30	-.20	-.61 +
8.	Rough-Smooth	.55 +	.28	.32
9.	Good-Bad	.14	-.75 +	-.23
10.	Complex-Simple	.41	.00	.44
11.	Cruel-Kind	.57	.39	.30
12.	Violent-Peaceful	.64 +	.27	.43
13.	Dark-Bright	.00	.27	.69 +
14.	Soothing-Disturbing	-.37	-.63 +	-.21
15.	Ugly-Beautiful	.15	.72 +	.25
16.	Active-Passive	.73 +	-.02	-.18
17.	Calm-Exciting	-.80 +	-.03	.03
18.	Vigorous-Placid	.84 +	.02	.09
19.	Fast-Slow	.82 +	.02	.15
20.	Tense-Relaxed	.62 +	.37	.13
21.	Weak-Powerful	-.74 +	.15	-.19
22.	Happy-Sad	.30	-.50	-.35
23.	Humourous-Serious	.00	.01	.03
	% of Variance	30.00	17.00	6.30

+ indicates scales which load on factors

TABLE VIII

Mean Scores and ANOVA Results for 4X4 Music X Sport Design

	Mean Raw Scores Across Music				Mean Raw Scores Across Sport			
	Low		High		High		Low	
	M_1	M_2	M_3	M_4	S_1	S_2	S_3	S_4
Dynamism:								
17 calm-exciting	5.10	4.55	5.00	5.35	5.97	5.82	4.32	3.87**
18 vigorous-placid	2.92	3.17	2.72	2.55	1.65	1.97	3.25	4.50**+
16 active-passive	1.70	2.70	2.10	2.35 +	1.80	1.52	2.50	3.02**
19 fast-slow	3.05	3.20	2.67	2.75*	1.80	1.62	3.45	4.80**+
21 weak-powerful	5.17	4.85	4.80	5.17	5.67	5.62	4.80	3.90**+
6 alert-drowsy	2.25	2.92	2.62	2.37	2.25	2.35	2.85	2.92*
20 tense-relaxed	3.50	3.87	3.42	3.22	3.17	2.70	3.90	4.25**
4 heavy-light	4.05	4.12	4.35	3.82	3.25	4.00	4.32	4.77**
Harmony:								
22 dark-bright	5.27	5.35	5.40	4.95	5.20	4.55	5.70	5.52**+
12 orderly-chaotic	3.30	2.85	3.67	3.57	3.80	4.35	2.92	2.32**
2 violent-peaceful	4.20	4.47	4.10	3.90	2.52	2.72	5.73	5.62**
Evaluative:								
22 happy-sad	3.15	3.27	2.95	3.07	2.85	3.22	3.12	3.25
9 good-bad	2.32	2.60	2.57	3.17	2.65	2.60	2.80	2.62
1 comfortable-uncomfortable	5.35	5.55	5.72	5.05	5.40	5.47	5.47	5.32
15 ugly-beautiful	4.82	4.67	4.80	4.15 +	4.27	4.40	4.62	5.15**
3 sour-sweet	3.67	4.17	4.22	3.85	4.02	3.92	4.22	4.05

	Mean Factor Scores Across Music				Mean Factor Scores Across Sport			
Dynamism	-0.16	0.24	0.44	-0.12	-0.61	-0.45	0.30	0.76**+
Harmony	0.14	0.04	-0.11	0.08	-0.40	-0.64	0.45	0.60**
Evaluative	0.06	-0.05	0.30	-0.31 +	0.04	0.03	0.03	-0.10

** indicates high-low discrimination significant at .01 level
* indicates high-low discrimination significant at .05 level
+ indicates significant difference within nesting at .05 level
Scores underlined with one type of underlining were differentiated from all scores without that particular type of underlining in Duncan testing

where results indicated significant differences, in order to investigate the nature of these differences. Products of these analyses were coded by underlining the means. All means underlined by one type of line differed significantly from all those not underlined with that particular type of line. The results show a clear distinction between sports chosen for High versus Low Dynamism. Football and hockey were clearly shown as more exciting, vigorous, active, fast, powerful, alert, tense and heavy. Conversely, golf and curling were seen as more calm, placid, passive, slow, weak, drowsy, relaxed and light. This distinction is also made clear at the factor level where football and hockey are clearly seen as more dynamic than curling and golf. It should be noted that a significant difference did occur at the .05 level for stimuli within the nested factor on the Dynamism factor, but a close examination of results at the scale levels shows this to be a difference of degree and not kind. Curling and golf were shown to be significantly different on the vigorous-placid, fast-slow and weak-powerful scales. A close examination of the mean scores on these scales shows that golf scored more towards low extreme but the fact that curling scores in the same direction implies that this is a difference in degree and not kind. The fact that both score differently from football and hockey at the level of High versus Low Dynamism corroborates this interpretation. Results of Duncan tests at the factor level also tend to support this hypothesis.

The musical stimuli did not fair nearly as well. The only

significant difference, at the .05 level, occurred on the fast-slow scale and this was not enough to produce any significant difference on the overall Dynamism factor. These results clearly indicate a dominance of the visual over the auditory component in the stimuli presented.

While the results for the Harmony and Evaluative factors are not of direct interest they are worth noting. For example, sporting events which scored low on Dynamism were also seen as more Harmonious. Golf and curling were seen as more bright, orderly and peaceful. Conversely, football and hockey were seen as more dark, chaotic and violent. These results, however, must be viewed with some caution since the nesting procedure was based purely on the Dynamism factor. Secondly, there were, in this case, significant audio-video interaction effects on all three Harmony scales which did not occur on any Dynamism scales. Again, however, no significant results were produced across musical stimuli, reaffirming the dominance of the visual component. The Evaluative factor produced no noteworthy information.

The mean scores computed for the next ANOVA are presented in table IX. This analysis was based on the 5X4 factorial design where the four sport stimuli with no music were added to the data set. The procedure used in this case did not involve any nesting of stimuli. In cases where results showed significant differences Duncan multiple range tests were applied to the data to determine the nature of these differences. Again, underlining was used to indicate differences.

TABLE IX

Mean Scores and ANOVA Results for 5X4 Sport X Music Design

	Mean Raw Scores Across Music					Mean Raw Scores Across Sport			
Dynamism	M_0	M_1	M_2	M_3	M_4	S_1	S_2	S_3	S_4
18 vigorous-placid	3.07	2.92	3.17	2.72	2.55	1.68	1.94	3.44	4.50**
17 calm-exciting	5.15	5.10	4.55	5.00	5.35	6.00	5.75	4.28	4.06**
19 fast-slow	3.45	3.05	3.20	2.67	2.75	1.82	1.70	3.62	4.94**
21 weak-powerful	4.82	5.17	4.85	4.80	5.17	5.74	5.58	4.52	4.02**
16 active-passive	2.17	1.70	2.70	2.10	2.35	1.74	1.54	2.40	3.14**
4 heavy-light	4.45	4.05	4.12	4.35	3.82	3.30	4.06	4.44	4.84**
20 tense-relaxed	3.65	3.50	3.87	3.42	3.22	3.04	2.78	4.06	4.26**
6 alert-drowsy	2.42	2.25	2.92	2.82	2.37	2.12	2.32	3.00	2.80**
Evaluative:									
22 happy-sad	3.32	3.15	3.27	2.95	3.07	2.96	3.34	3.12	3.20
9 good-bad	3.15	2.32	2.60	2.57	3.17	2.68	2.82	2.88	2.68
1 uncomfortable-comfortable	5.50	5.35	5.55	5.72	5.05	5.48	5.50	5.46	5.30
15 ugly-beautiful	4.50	4.82	4.67	4.80	4.15	4.32	4.34	4.58	5.12**
14 soothing-disturbing	3.92	3.47	3.65	3.22	3.80	4.02	4.00	3.50	2.94**
5 sour-sweet	4.27	3.97	4.17	4.22	3.85	4.12	3.90	4.24	4.14
Harmony:									
7 orderly-chaotic	2.60	3.30	2.85	3.65	3.57**	3.66	4.20	2.72	2.22**
13 dark-bright	5.07	5.27	5.35	5.40	4.95	5.02	4.66	5.56	5.60**
	Mean Factor Scores Across Music					Mean Factor Scores Across Sport			
Dynamism	0.11	-0.19	0.22	0.00	-0.14	-0.67	-0.49	0.39	0.76**
Evaluative	-0.21	0.12	-0.01	0.36	-0.25*	0.02	-0.02	0.05	-0.04
Harmony	0.11	0.14	0.02	-0.18	-0.09	-0.40	-0.56	0.39	0.57*

**Indicates discrimination significant at .01 level
*Indicates discrimination significant at .05 level
Scores underlined with one type of underlining were differentiated from all scores without that particular type of underlining in Duncan testing

Again there are clear indications that sports of High and Low Dynamism are easily discriminated. Again differences between S_3 and S_4 appear to be of degree and not kind. Of greater interest is the recurrence of a failure to discriminate across musical stimuli. The addition of the M_0 -no music enables the comparison of sporting events without music with those with music. Clearly the Dynamism factor and its individual scales produce little or no indication of a significant difference. The one positive result on the passive-active scale provides no useful information with regard to the music-no music comparison. Thus, the hypothesis that the addition of music will significantly affect the perception of sports fails to gain support.

The results for the Evaluative factor are of more interest. Some significant results occurred across visual stimuli at the scale level but these were not substantiated for the overall Evaluative factor. The results across musical stimuli deserve more attention. This is reflected in significant results on the good-bad scale which are in turn reflected at the factor level. Both the no-music and the fourth musical condition are seen as less good than the other three. For the overall Evaluative factor this difference was again reflected in a more negative evaluation for those two conditions. Thus, on the Evaluative factor there is at least limited support for a musical effect. Caution must be taken, however, since these results are to a certain extent serendipidous because the original grouping of variables was based on the Dynamism scale. Also, a perusal of the original

pretest factor scores on which the choice of variables was made (table III) shows that M_3 and M_4 had very similar factor scores (-.32 and -.38 respectively). M_1 and M_2 conversely scored originally in the opposite direction (.34 and .37 respectively). The results presented on table IX, however, show that factor scores for M_3 and M_4 represent opposite extremes, with M_1 and M_2 roughly in the middle. This anomaly would appear to cast doubt on these results, possibly suggesting the presence of chance error or an extraneous and unaccounted for factor. Statistically speaking, these results do not carry nearly the weight of those observed earlier for visual stimuli.

The fact that the no-music condition received a significantly lower evaluation than three of the music conditions deserves some notice. While the same reservations as mentioned above apply, there is a suggestion here that the addition of music to the video stimuli did add something to their Evaluative qualities. The fact that M_1, M_2 and M_3 all score toward the positive Evaluative pole would seem to indicate that they each added something regardless of differences. The fact that "Thelonius", originally scored as the second most negatively evaluated in pretesting, produced the most positive (more happy, good, comfortable etc.) response on the Evaluative factor appears rather paradoxical.

The Harmony factor again produced a clear-cut distinction between orderly, bright versus chaotic, dark sport stimuli. There was also some distinction across musical stimuli for the orderly-chaotic scales but this did not hold up at the factor level.

ANOVA was also performed using data from the 4X5 factorial arrangement where the four musical stimuli with no sport present were added to the data set. Again nesting was not employed and results appear on table X, with Duncan multiple range tests being applied where results were significant. Results for the Dynamism factor across the four sporting events were essentially the same as those in table IX, as should be expected. Results for the music, no-sport condition (S_0) failed to differentiate from only S_3. The S_0 results do place it between the extreme scores of the sport stimuli (ie. S_1 and $S_2 < S_0 < S_4$).

For the first time markedly significant results on the Dynamism factor appear across musical stimuli. M_2 is seen as more placid, slow, calm and passive, and less vigorous, fast, exciting and active than M_1, M_2 and M_3. It attains a lower Dynamism rating than these three at the factor level. This result can be seen as a product of the addition of four music, no-sport cells which were not present in earlier analyses. Thus, the lack of an overpowering visual effect allows for discrimination amongst musical stimuli.

Similarly, while noteworthly results on the Evaluative factor are absent across visual stimuli, there is discrimination across musical stimuli. M_4 is seen as more bad and uncomfortable, and less good and comfortable than M_1, M_2 and M_3. This distinction prevails at the factor level where it receives a significantly lower evaluation than the other three. Again, this can be accounted for by the inclusion of the music, no-sport conditions.

TABLE X

Mean Scores and ANOVA Results for 5X4 Sport X Music Design

	Mean Raw Scores Across Music				Mean Raw Scores Across Sport				
Dynamism:	M_1	M_2	M_3	M_4	S_0	S_1	S_2	S_3	S_4
18 vigorous-placid	2.98	3.58	2.58	2.72**	3.45	1.65	1.97	3.25	4.50**
19 fast-slow	3.02	3.64	2.54	2.92**	3.45	1.80	1.62	3.45	4.80**
17 calm-exciting	5.00	4.22	5.16	5.30**	4.60	5.97	5.82	4.32	3.87**
21 weak-powerful	5.16	4.78	4.82	5.20	4.95	5.67	5.82	4.80	3.90**
16 active-passive	1.88	2.94	2.00	2.32**	2.57	1.80	1.52	2.50	3.02**
12 violent-peaceful	4.32	4.74	3.94	3.84**	4.37	2.52	2.72	5.75	5.67**
20 tense-relaxed	3.74	4.22	3.50	3.38	4.57	3.17	2.70	3.90	4.25**
6 alert-drowsy	2.62	3.16	2.80	2.48	3.45	2.25	2.35	2.85	2.92*
4 light-heavy	4.16	4.34	3.99	3.80	4.00	3.25	4.00	4.32	4.77**
Evaluative:									
9 good-bad	2.50	2.54	2.70	3.22*	3.02	2.65	2.60	2.80	2.62
1 uncomfortable-comfortable	5.34	5.68	5.52	4.92*	5.15	5.40	5.47	5.47	5.32
15 ugly-beautiful	4.74	4.86	4.68	4.24	4.70	4.27	4.40	4.62	5.15*
3 sour-sweet	3.98	4.28	4.10	3.84	4.02	4.02	3.92	4.22	4.05
14 soothing-disturbing	3.44	3.42	3.54	3.80	3.60	3.92	3.87	3.40	2.95*
Harmony:									
13 dark-bright	5.01	4.94	5.24	5.00	4.30	5.20	4.55	5.70	5.52**
7 orderly-chaotic	3.52	2.86	3.82	3.78*	4.07	3.80	4.35	2.92	2.32**

	Mean Factor Scores Across Music				Mean Factor Scores Across Sport				
Dynamism	-0.09	0.40	-0.14	-0.15**	0.32	-0.74	-0.63	0.29	0.76**
Evaluative	0.13	0.09	0.09	-0.32	0.10	-0.04	0.00	-0.02	-0.09
Harmony	0.02	-0.09	0.02	0.03	-0.55	-0.11	-0.46	0.51	0.62**

**indicates discrimination significant at .01 level
*indicates discrimination significant at .05 level
Scores underlined with one type of underlining were differentiated from all scores without that particular type of underlining in Duncan testing

Results on the Harmony factor again produced significant results across sport conditions, analogous to those previously observed, and no worthwhile results across musical conditions.

The final set of analyses involved one-way ANOVAs involving only single modality conditions. The results for the four sport conditions where no music was presented are shown on table XI. Stimuli were again nested within the High and Low Dynamism distinction derived from pretesting. The results across the four sport conditions are highly similar to those obtained in previous analyses where musical conditions were also included. Again both the Dynamism and Harmony factors produced highly significant results. The distinction between High and Low Dynamism derived from pretesting is maintained. The fact that this distinction remained even with the addition of music implies that the impressions projected by these stimuli maintained their integrity in spite of that addition.

The same one-way nested ANOVA was applied to the four music, no-sport stimuli. The results are presented in table XII. Again a significant distinction between High and Low Dynamism musical stimuli is noted. In this case, however, significant results within nesting are also noted for three scales and also at the overall factor level. The fact that M_1 scored closer to M_4 than to M_2, with which it was nested, is particularly worth noting. This would seem to indicate that the pretest high-low distinction was not as clearly maintained as it was with the sport stimuli. This observation is corroborated by the results of the 4X5 ANOVA

TABLE XI

Mean Scores and ANOVA Results Across Sport Stimuli

	High		Low	
Dynamism:	S_1	S_2	S_3	S_4
18 vigorous-placid	1.80	1.80	4.20	4.50**
17 calm-exciting	6.10	5.60	4.10	4.80**
19 fast-slow	1.90	2.00	4.30	5.50**
21 weak-powerful	6.00	5.40	3.40	4.50**
16 active-passive	1.50	1.60	2.00	3.60**
4 heavy-light	3.50	4.30	4.90	5.10**
20 tense-relaxed	2.50	3.10	4.70	4.30**
6 alert-drowsy	1.60	2.20	3.60	2.30*
Evaluative:				
22 happy-sad	3.40	3.80	3.10	3.00
9 good-bad	2.80	3.70	3.20	2.90
1 uncomfortable-comfortable	5.80	5.60	5.90	5.20
15 ugly-beautiful	4.50	4.10	4.40	5.00
14 soothing-disturbing	4.40	4.50	3.90	2.90*
3 sour-sweet	4.50	3.80	4.30	4.50
Harmony:				
7 orderly-chaotic	3.10	3.60	1.90	1.80**
13 dark-bright	4.30	5.10	5.00	5.90
	Mean Factor Scores Across Sport			
Dynamism	-0.69	-0.37	0.80	0.73**
Evaluative	-0.20	-0.47	-0.08	-0.10
Harmony	-0.52	-0.18	0.30	0.86**

**indicates discrimination significant at the .01 level
*indicates discrimination significant at the .05 level

TABLE XII

Mean Scores and ANOVA Results Across Musical Stimuli

	Low		High	
Dynamism:	M_1	M_2	M_3	M_4
18 vigorous-placid	3.20	5.20	2.00	3.40** ++
19 fast-slow	2.90	5.40	2.00	3.60** ++
17 calm-exciting	4.60	2.90	5.80	5.10** +
21 weak-powerful	5.10	4.50	4.90	5.30
16 active-passive	2.60	3.90	1.60	2.20**
12 violent-peaceful	4.80	5.80	3.30	3.60**
20 tense-relaxed	4.70	5.60	3.80	4.00*
6 alert-drowsy	4.10	4.10	2.70	2.90*
4 light-heavy	4.60	5.20	2.50	3.70**
Evaluative:				
9 good-bad	3.20	2.30	3.20	3.40
1 uncomfortable-comfortable	5.30	6.20	4.70	4.40*
15 ugly-beautiful	4.40	5.60	4.20	4.60
3 sour-sweet	4.00	4.70	3.60	3.80
14 soothing-disturbing	3.30	2.50	4.80	3.80*
Harmony:				
13 dark-bright	4.10	3.30	4.60	5.20*
7 orderly-chaotic	4.40	2.90	4.40	4.60
	Mean Factor Scores Across Music			
Dynamism	0.29	1.40	-0.44	0.03** +
Evaluative	0.34	0.71	-0.34	-0.28*
Harmony	-0.76	-1.14	-0.07	-0.24*

**Indicates discrimination significant at the .01 level
*Indicates discrimination significant at the .05 level
+Indicates significant differences within nesting at .05 level

where only M_2 was clearly differentiated from the other three musical conditions.

The high-low distinction was much more clearly supported on the Evaluative and Harmony factors. In both cases no differences within nesting were noted. This is somewhat surprising since the nesting was originally based on the Dynamism factor.

CHAPTER VI

DISCUSSION

The first major question posed in this experiment was derived from previously recorded findings that indicated a marked tendency for auditory to dominate video components in mixed media, when the auditory channel involved verbal communication. It was hoped that by substituting musical for verbal content in the audio channel, a further contribution to the field of media study might be made. More specifically the question was posed: Will audio or video dominate when music is substituted in the audio channel? Clearly the present study provides overwhelming support for the contention that visual material dominates when this sort of combination is made. Results across visual stimuli indicated that subjects consistently discriminated sporting events when dramatically different musical stimuli were present. The same was not true for musical stimuli. While some discrimination was apparently possible, it was neither consistent nor highly significant.

The second major question posed concerned the effects of combining compatible or incompatible auditory stimuli with compatible or incompatible visual stimuli. More specifically, would compatible combinations of auditory and visual stimuli produce effects greater than those of either in isolation. Conversely, would incompatible combinations result in an overall reduction

in effect. The absence of any significant interaction effects would indicate that compatibility had no noticeable effect on outcomes. What was strongly supported by Nelson and Moll (Nelson & Moll, 1951 and Nelson, 1953) at the level of knowledge acquisition appears to be much more difficult to substantiate at a connotative level. Some thought must be given to why such results were not forthcoming in the present study.

The fact that no support for the compatibility hypothesis was forthcoming does not necessarily mean that effects were not present at a less than noticeable level. It is also possible that the stimuli chosen for the experiment were lacking in some way. As operationally defined in pretesting, both the musical and sport stimuli clearly embodied the qualities required for the proper exploration of the compatibility hypothesis. The results of one-way ANOVAs, however, indicate that those qualities may have failed to be maintained for certain of the chosen stimuli. In the case of the sport stimuli, the results clearly supported those obtained in pretesting. The High and Low Dynamism stimuli were easily differentiated. For the musical stimuli, however, differentiation was not as clear-cut as it had been in pretesting. High and Low Dynamism musical stimuli were in fact seen as significantly different, but one of the stimuli, "Song of the Wind" (M_1), achieved a score closer to one of the supposedly opposite stimuli (M_4) than to the stimulus it had been paired with (M_2). This disparity suggests that in some way the pretest or criteria may have failed partially in this case. A closer look at the stimuli involved appears warranted.

M_1, "Song of the Wind", is a bright, moderately fast tempoed piece in which electric guitar predominates. The volume of the lead guitar is moderately high but not loud. M_2, "Diamond Dust", is a despondent, slow tempoed piece where electric guitar again assumes a central role. The volume of the lead guitar is low. M_4, "A Love Supreme", is an aggressive, fast tempoed piece also featuring lead guitar. The volume of the lead guitar is high. Although these descriptions are more subjective that the operationally defined criterion originally employed, they may provide some hints as to why subjects viewing only isolated stimuli produced less acute distinctions.

Before going further, a comparison of certain characteristics of the visual and auditory stimuli might be helpful. Visual stimuli have certain qualities which tend to make them appear more objective and concrete. Characteristics of spaciality such as linearity, pattern and movement give visual information a certain immediacy and concreteness which is not present in musical stimuli, which tend to be more abstract and ambiguous, relying more on temporal analogy than spaciality. How does this relate to the present discussion? Well, this "concrete" quality of spacial information may mean that the interpretation of sporting events may have more "integrity" across situations. Recall that the pretest situation involved experiencing each stimulus in a single session which involved also viewing a number of other stimuli. That is, each subject saw or heard a number of stimuli in the same sitting. Conversely, in the experimental situations each group of subjects experienced only a single stimulus. If

sporting events had a quality of concreteness which was lacking in musical stimuli they may have been less influenced by the other stimuli with which they were grouped. Thus, the results for each sport stimulus would be less influenced by the others with which it was grouped and more likely to produce the same results when presented in isolation. Musical stimuli, because they are more ambiguous, may be less able to maintain their integrity when presented within a group. It may be that subjects were more likely to view single musical stimuli within the context of the whole set of musical stimuli with which they were presented. Subjects may have coped with musical ambiguity by subconsciously contrasting them with each other. Thus, the presence of more dynamic musical pieces such as "A Love Supreme", may have made more moderate pieces such as "Song of the Wind" appear less dynamic, producing an artificial polarization effect. When these same stimuli were later presented in isolation to the experimental groups, this effect would no longer be present and a discrepency between pretest and experimental results would occur. This may be what happened with "Song of the Wind".

The implications of the preceding discussion obviously go beyond merely the present study. Clearly, any study where large numbers of stimuli are presented to the same group of subjects must take them into account. Wherever this occurs, such induced exaggeration of inter-stimulus differences may be present, particularly if the stimuli are of an ambiguous nature.

Such considerations also have bearing on the issue of visual dominance. This tendency of musical stimuli to rely on context

to provide definition may partly explain the apparent dominance of the visual over musical stimuli. Just as within a group of other musical stimuli the interpretation of one piece may be distorted by the presence of the others so when paired with a visual event it may tend to be defined through that visual stimulus. In his book, The Musical Symbol; A Study of the Philosophic Theory of Music, Gordon Epperson describes music as a symbolic analogue for emotional life which stresses relationship rather than content (Epperson, 1967). Epperson believes that musical expression is non-particularized and universal. Thus, it is very open to different interpretations depending on the idiosyncratic characteristics of the viewer, or context-induced meanings. Therefore, it may be that the different musical stimuli simply allowed whatever visual stimulus they were paired with to provide their meaning.

Obviously this has implications for future studies in mixed media involving music. It may be that by altering the content of visual stimuli one could make it more possible for music to produce a noticeable effect. Sporting events may have provided a competing stimulus that was too particularized and articulated. Sports, obviously, are highly ritualized and patterned events. Perhaps more ambiguous visual stimuli would provide more likelihood of noticeable effects across musical stimuli. Using unstructured events such as interpersonal interactions or interplays of abstract patterns might be more appropriate.

In a recent publication, Marshall McLuhan et al have stressed the traditional figure-ground distinction in studying

media (McLuhan, Hutchon and McLuhan, 1977). They note that sight is usually figure with all other senses as ground although there may be some exceptions. Clearly, the present study provides support for this contention where television is concerned. There may be situations, however, as McLuhan et al point out, where sight may fade into ground and another sense such as hearing replaces it as figure. Making visual stimuli more ambiguous and less articulated might be a means of achieving this.

It would appear that the present study provides encouraging support for the use of the semantic-differential techniques in mixed media studies of this sort. In particular its use as a means of operationally defining stimuli through pretesting seems valuable. Clearly this technique provides definite advantages over more subjective methods of choosing stimuli.

In conclusion, considerable evidence has been gained supporting visual dominance over audio when music fills the auditory channel. Some suggestions have been discussed concerning the use of less structured, concrete visual stimuli in order to provide more room for musical effects. While the present study has failed to provide much evidence as to effects across musical stimuli, the possibility that such effects might be observed under different circumstances cannot be ruled out. The use of the semantic differential for operationally defining stimuli in pretesting has been shown to be useful and effective.

APPENDIX

Instruction I

You are participating in an experiment on musical communication. Please read this page over until you are sure you understand the instructions.

Within this booklet are ten sets of "scales" - one for each musical piece you will be hearing shortly. There is one page of scales for each musical piece; the scales are identical for each piece. There are 23 pairs of adjectives with which you will describe your reactions to the pieces on each page. The first scale is orderly - chaotic. There are seven possible positions on this scale for you to record a reaction with an 'X' or a ' '. If you felt that piece number one was very, very chaotic you would score it as follows:

orderly :___:___:___:___:___:___:_X_: chaotic

If you thought the first piece was very very orderly you would score:

orderly :_X_:___:___:___:___:___:___: chaotic

If you thought it was only somewhat orderly you would score it:

orderly :___:___:_X_:___:___:___:___: chaotic

And so on with all twenty three sets of adjectives for each piece. Put only one mark in any one scale, and be absolutely sure NOT TO SKIP ANY SCALES for each piece. When you are finished the experiment, you must have 23 check marks for 23 scales for each piece. Please check all ten pages for omissions when the experiment is over.

You may begin scoring each piece while it is playing, but I will pause briefly between pieces to allow you to finish. You are now ready to begin.

In this second phase of the experiment we are dealing with visual communication. Please read this page over until you are sure you understand the instructions.

Within this booklet are 11 sets of "scales" one for each video clip you will be seeing shortly. There is one page of scales for each clip; the scales are identical for each one. There are 23 pairs of adjectives with which you will describe your reactions to each clip. The first scale is orderly - chaotic. There are seven possible positions on this scale for you to record your impression with an : X : or a :___:. If you felt that video clip number one was very very chaotic you would score it as follows:

orderly :___:___:___:___:___:___:_X_: chaotic

If you thought the first piece was very, very orderly you would score:

orderly :_X_:___:___:___:___:___:___: chaotic

If you thought it was only somewhat orderly you would score:

orderly :___:___:_X_:___:___:___:___: chaotic

And so on with all 23 sets of adjectives for each piece. Put only one mark on any one scale, and be absolutely sure NOT TO SKIP ANY SCALES for each clip. When you are finished the experiment you must have 23 check marks for 23 scales for each video clip. Please check all 11 pages for omissions when the experiment is over. When this phase of the experiment is finished, please wait for further instructions. I will pause briefly between clips to allow you to finish. You should now be ready forbegin.

ORDERLY	: : : : : : :	CHAOTIC
CALMING	: : : : : : :	EXCITING
DROWSY	: : : : : : :	ALERT
RELAXED	: : : : : : :	TENSE
GOOD	: : : : : : :	BAD
CLEAR	: : : : : : :	INDEFINITE
UGLY	: : : : : : :	BEAUTIFUL
SLOW	: : : : : : :	FAST
HAPPY	: : : : : : :	SAD
DARK	: : : : : : :	BRIGHT
SIMPLE	: : : : : : :	COMPLEX
FAMILIAR	: : : : : : :	UNFAMILIAR
SOOTHING	: : : : : : :	DISTURBING
WEAK	: : : : : : :	POWERFUL
COMFORTABLE	: : : : : : :	UNCOMFORTABLE
PASSIVE	: : : : : : :	ACTIVE
CRUEL	: : : : : : :	KIND
LIGHT	: : : : : : :	HEAVY
SMOOTH	: : : : : : :	ROUGH
SWEET	: : : : : : :	SOUR
PLACID	: : : : : : :	VIGOROUS
SERIOUS	: : : : : : :	HUMOUROUS
PEACEFUL	: : : : : : :	VIOLENT

Post Experimental Questionnaire

Please fill in the following as indicated. When you are finished recheck to make sure you haven't missed any. Please print.

1. Name:

2. Sex:

3. Visual or hearing deficits:

4. Beside each of the following list the number of hours spent listening to each on an average day:

   (a) Television; hrs

   (b) Radio; hrs

   (c) Records or tape; hrs

5. Number the following in terms of preference. Your most preferred form of music would score1, your second most preferred a 2 and so on.

   (a) Jazz ( )

   (b) Rock ( )

   (c) Country and Western ( )

   (d) Classical ( )

   (e) Easy Listening ( )

   (f) Folk ( )

   (g) Other ( ) specify: _____

6. Number the following types of television programming in order of preference:

   (a) Sports ( )

   (b) Westerns ( )

   (c) Detective ( )

   (d) Spy ( )

   (e) Children's ( )

   (f) News and documentary ( )

   (g) Comedy ( )

(b) Variety ( )

(c) Other ( ) specify: _____

7. Check one of the following to indicate the amount of violence on television.

(a) Too much _____

(b) Medium amount _____

(c) Not enough _____

8. Check one of the following to indicate the amount of violence in rock music.

(a) Too much _____

(b) Medium amount _____

(c) Not enough _____

Thank you for participating.

INSTRUCTIONS

You are participating in an experiment concerning media communication. Please read this page over until you are sure you understand the instructions.

On the next page is a set of scales. You will be using these scales to describe your reaction to a presentation which will commence shortly. There are 23 pairs of adjectives in the set. The first scale is uncomfortable - comfortable. There are seven possible positions on the scale for you to record a reaction with an 'X' or a ' '. If you felt that the presentation was very, very comfortable, you would score it as follows:

UNCOMFORTABLE :___:___:___:___:___:___:X_: COMFORTABLE

If you thought it was very, very uncomfortable, you would score:

UNCOMFORTABLE :_X_:___:___:___:___:___:___: COMFORTABLE

If you thought it was only somewhat uncomfortable you would score:

UNCOMFORTABLE :___:___:_X_:___:___:___:___: COMFORTABLE

And so on, for all twenty-three sets of adjectives. Put only ONE mark on each scale, and be absolutely sure NOT TO SKIP ANY SCALES. When you have finished there must be 23 check marks for the 23 scales. Please be sure to check for omissions.

You may begin scoring the presentation immediately after it is completed. When you are ready to begin, set the scales in front of you and face forward. It is vitally important that you remain calm and attentive to the experience.

UNCOMFORTABLE	:____:____:____:____:____:____:____:	COMFORTABLE
UNFAMILIAR	:____:____:____:____:____:____:____:	FAMILIAR
SOUR	:____:____:____:____:____:____:____:	SWEET
HEAVY	:____:____:____:____:____:____:____:	LIGHT
INDEFINITE	:____:____:____:____:____:____:____:	CLEAR
ALERT	:____:____:____:____:____:____:____:	DROWSY
ORDERLY	:____:____:____:____:____:____:____:	CHAOTIC
ROUGH	:____:____:____:____:____:____:____:	SMOOTH
GOOD	:____:____:____:____:____:____:____:	BAD
COMPLEX	:____:____:____:____:____:____:____:	SIMPLE
CRUEL	:____:____:____:____:____:____:____:	KIND
VIOLENT	:____:____:____:____:____:____:____:	PEACEFUL
DARK	:____:____:____:____:____:____:____:	BRIGHT
SOOTHING	:____:____:____:____:____:____:____:	DISTURBING
UGLY	:____:____:____:____:____:____:____:	BEAUTIFUL
ACTIVE	:____:____:____:____:____:____:____:	PASSIVE
CALMING	:____:____:____:____:____:____:____:	EXCITING
VIGOROUS	:____:____:____:____:____:____:____:	PLACID
FAST	:____:____:____:____:____:____:____:	SLOW
TENSE	:____:____:____:____:____:____:____:	RELAXED
WEAK	:____:____:____:____:____:____:____:	POWERFUL
HAPPY	:____:____:____:____:____:____:____:	SAD
HUMOROUS	:____:____:____:____:____:____:____:	SERIOUS

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Media Study: Codebook

Column	Variablename	Description and codes
1 - 3	Sub	The number of a subject in the experiment. Runs from 1 to 240
4	Audstim	Numbers 0 to 4 which stand for audio stimuli 1 = song of the wind 2 = thelonius 3 = a love supreme 4 = diamond dust 0 = no music
5	Audpair	Presence or absence of a video stimulus 1 = present/paired 2 = present/not paired 0 = no music
6	Audvio	Is audio active or passive 1 = active 2 = passive 0 = no music
7	Vidstim	Number 0 to 4 which stand for video stimuli 1 = football 2 = hockey 3 = curling 4 = golf 0 = no sport
8	Vidpair	Presence or absence of an audio stimulus 1 = present/paired 2 = present/unpaired 0 = no sport
9	Vidvio	Is video active or passive 1 = active 2 = passive 0 = no sport

Column	Variablename	Description and codes
10	Sex	Sex of subject 1 = male 2 = female
11 - 33	Scale 1 to Scale 23	23 scores on semantic differential scales. Individual scores range from 1 to 7 and represent a positional placement on a bipolar dimension.
35 - 75	Factor A to Factor E	Factor scores on individual factors.

VITA AUCTOIS

John Schmelefske grew up in Trout Creek, a small town in northern Ontario. He attended public and secondary school there.

His undergraduate education began in 1970 at Brock University in St. Catharines, Ontario. During the summers he was employed in a variety of jobs including remedial teaching for children with learning disabilities, and fire fighting for the Ministry of Natural Resources. During his final undergraduate year he was employed as both a teaching assistant and a research assistant in the Psychology department. In 1974 he was awarded an Honours B.A. in Psychology.

John moved to Windsor in the fall of 1974 to enter the graduate programme in psychology. While attending the University of Windsor, he again worked as a teaching assistant. He also worked part-time at Windsor Group Therapy Project, in their treatment home for distrubed boys. Having completed the course requirements he took on the position of residential supervisor at Windsor Group Therapy Project. He continued to work on his M.A. thesis. His responsibilities included case managment, individual and group staff supervision, play therapy and behavioural managment. He completed the Masters requirements in November, 1979. John has recently accepted a psychometrist's position at the York County Hospital in Newmarket, Ontario, where he will be working with children and families.

OBS	SUB	ADJMAY	ADJAPR	ADJAUG	VIDMAY	VIDAPR	VIDAUG	SEX	SCALE1	SCALE2	SCALE3	SCALE4	SCALE5	SCALE6	SCALE7	SCALE8	SCALE9	SCALE10	SCALE11	SCALE12	SCALE13	SCALE14	SCALE15	SCALE16	SCALE17	SCALE18	SCALE19	SCALE20	SCALE21	SCALE22	SCALE23	FACTORA	FACTORB	FACTORC	FACTORD	FACTORE
1	1	1	1	2	1	1	1	1	6	6	4	4	6	3	3	3	1	4	4	4	4	5	6	1	6	2	3	3	5	4	6	-0.3289	0.3414	-0.1316	0.4319	0.4810
2	2	1	1	2	1	1	1	2	3	2	1	1	1	5	1	5	2	3	1	3	5	3	1	6	1	2	2	6	4	4	-1.4866	-1.5444	0.0529	-2.5124	-0.9857
3	3	1	1	2	1	1	1	2	2	6	3	1	3	1	6	2	3	2	3	2	6	6	4	1	7	1	1	2	7	3	6	-1.8361	-0.9039	0.2856	-1.2331	0.5086
4	4	1	1	2	1	1	1	1	5	5	2	2	5	2	5	2	3	6	3	3	6	6	3	2	6	2	2	3	5	2	2	-0.9108	-0.6463	0.3686	-0.7108	-2.3689
5	5	1	1	2	1	1	1	1	6	7	6	1	7	1	4	1	1	1	4	3	4	4	6	1	7	1	1	1	7	2	7	-1.4804	1.0616	-0.8814	0.6368	2.1754
6	6	1	1	2	1	1	1	1	7	7	7	5	7	4	4	1	1	7	4	2	4	4	4	2	6	1	1	3	6	2	3	0.1155	1.5001	-2.4151	1.4023	-0.5262
7	7	1	1	2	1	1	1	2	6	7	4	4	7	1	1	3	2	7	4	3	7	4	5	1	7	3	3	6	4	2	6	-0.5407	0.2479	1.3335	0.8934	-1.0126
8	8	1	1	2	1	1	1	2	7	7	4	7	6	5	5	2	4	2	2	2	5	3	4	5	3	4	3	4	6	4	6	1.1190	0.0048	-2.2991	0.8351	0.1808
9	9	1	1	2	1	1	1	2	5	2	1	2	2	3	7	1	5	2	3	1	5	6	2	1	6	1	3	2	6	4	3	-1.1924	-1.2926	-0.3582	-2.4864	-1.6955
10	10	1	1	2	1	1	1	1	7	7	4	1	7	1	1	1	1	3	4	2	6	2	6	1	7	2	2	6	6	2	6	-1.3256	1.0827	0.7710	0.4254	-0.3908
11	11	2	1	1	1	1	1	2	7	5	2	1	7	1	7	1	1	2	4	3	7	5	5	1	7	1	1	1	7	3	5	-2.0921	0.2088	0.6892	-0.6615	-0.4783
12	12	2	1	1	1	1	1	1	6	7	5	4	5	2	2	2	2	6	4	2	6	4	4	2	3	1	2	5	6	4	6	-0.1611	0.1339	-0.2852	0.6708	-0.2332
13	13	2	1	1	1	1	1	1	7	7	6	6	7	2	1	4	2	6	4	4	4	2	5	2	6	2	1	4	4	2	4	0.2613	1.1604	-0.7354	1.5434	-0.5887
14	14	2	1	1	1	1	1	2	5	5	4	4	3	3	3	3	4	4	4	4	4	4	4	3	6	3	3	3	4	3	5	0.2010	-0.3338	-0.5383	-0.5353	0.0467
15	15	2	1	1	1	1	1	2	7	6	4	2	7	2	7	3	1	1	4	2	5	5	6	1	7	1	1	1	6	2	5	-1.4281	1.0522	-0.7983	-0.1460	0.5836
16	16	2	1	1	1	1	1	2	4	2	4	5	2	4	6	3	4	3	4	2	7	3	4	1	3	1	2	5	6	2	4	-0.2355	1.0896	-0.8337	-2.5848	-1.0418
17	17	2	1	1	1	1	1	2	7	7	4	3	7	2	2	4	1	5	4	5	7	2	4	1	7	3	3	5	6	1	4	-0.4983	1.1632	0.6984	0.5699	-1.2260
18	18	2	1	1	1	1	1	1	5	6	4	1	6	2	4	2	5	2	3	2	6	3	6	5	7	1	4	3	6	2	4	-0.7314	-0.1097	-0.0730	-0.1457	-0.2816
19	19	2	1	1	1	1	1	1	6	6	6	2	7	2	2	1	1	3	4	1	7	2	6	1	7	1	1	1	7	1	7	-1.5622	1.6753	-0.1085	0.0457	1.2607
20	20	2	1	1	1	1	1	1	7	6	4	3	6	1	2	2	1	6	5	3	6	2	6	1	7	1	1	2	6	2	6	-1.3140	1.1918	0.7512	0.1526	-0.1625
21	21	3	1	1	1	1	1	1	6	7	5	5	6	3	6	3	3	2	2	2	3	1	4	2	5	2	2	5	6	2	4	0.2362	1.1931	-2.5475	0.4799	-0.4760
22	22	3	1	1	1	1	1	2	5	3	4	2	6	1	5	1	4	2	4	2	5	6	3	1	6	1	1	1	6	4	3	-1.3126	-0.8957	-0.1638	-0.6026	-0.6243
23	23	3	1	1	1	1	1	2	3	6	3	5	2	4	6	1	4	5	4	4	5	4	4	2	5	3	1	2	4	4	4	0.1149	-0.6263	-0.9209	-1.0456	-0.8619
24	24	3	1	1	1	1	1	1	4	6	3	6	6	2	3	1	3	2	2	1	4	2	4	7	3	1	2	6	4	4	1	0.7031	-0.5216	-1.3692	0.5680	-2.7010
25	25	3	1	1	1	1	1	1	5	6	4	5	7	1	2	2	6	6	1	1	6	5	2	2	6	1	1	2	6	4	2	-0.7102	-1.7508	0.0142	1.4560	-2.3262
26	26	3	1	1	1	1	1	1	5	7	5	2	7	1	2	1	1	5	4	2	4	5	4	2	7	1	1	2	5	4	5	-0.9395	-0.5560	-0.1600	1.4723	0.1374
27	27	3	1	1	1	1	1	2	7	6	3	5	2	3	6	2	2	4	3	4	6	2	5	1	7	1	1	6	6	2	4	-0.9242	1.4896	-0.5418	-1.4429	-1.6920
28	28	3	1	1	1	1	1	1	5	4	4	4	5	1	2	3	3	3	3	4	5	6	4	1	6	1	2	3	7	2	6	-1.1439	-0.1326	0.3883	-0.5037	0.5149
29	29	3	1	1	1	1	1	2	5	7	4	5	6	2	5	5	6	6	3	2	3	5	2	1	7	1	2	2	7	4	4	-0.2276	-1.3757	-1.1299	1.4529	-0.5534
30	30	3	1	1	1	1	1	2	4	5	2	1	6	1	7	1	3	2	1	1	1	6	1	1	7	2	1	2	7	4	6	-1.2850	-1.7524	-1.5077	0.1925	0.2242
31	31	4	1	2	1	1	1	2	6	7	4	2	7	1	1	1	3	3	4	3	7	3	4	1	7	1	1	4	5	4	4	-1.2768	-0.4963	1.1779	0.8279	-1.2688
32	32	4	1	2	1	1	1	2	6	7	4	2	5	1	2	2	3	4	3	2	3	3	4	1	6	2	1	3	6	3	5	-0.8524	-0.1225	-0.5263	0.7000	-0.1886
33	33	4	1	2	1	1	1	1	6	7	5	3	6	3	4	2	2	3	2	2	6	3	5	1	5	5	3	4	5	3	3	-0.1185	0.4733	-0.7917	0.4969	-0.9434
34	34	4	1	2	1	1	1	1	6	7	5	3	6	2	2	3	2	6	4	4	6	3	6	1	6	1	1	2	6	2	6	-0.9458	0.7014	0.4186	0.4166	0.4625
35	35	4	1	2	1	1	1	1	6	2	5	1	1	5	6	3	4	1	2	2	7	6	4	7	5	2	2	5	4	4	6	0.2231	-0.1608	-1.3515	-2.2317	0.4941
36	36	4	1	2	1	1	1	2	6	7	4	5	5	3	2	2	2	3	2	2	6	6	4	1	6	1	1	1	6	2	7	-1.0374	0.0855	-0.4507	0.3224	0.7259
37	37	4	1	2	1	1	1	1	2	5	5	4	5	6	2	6	3	3	5	5	6	2	4	3	4	4	3	5	5	2	7	0.8097	0.2809	-0.2093	-1.0919	1.5270
38	38	4	1	2	1	1	1	1	6	7	5	3	6	2	2	6	1	6	4	3	6	4	6	1	7	1	2	5	6	3	5	-0.8150	0.5911	0.7417	0.7859	-0.1832
39	39	4	1	2	1	1	1	2	5	7	4	3	6	1	6	2	1	3	3	2	5	5	4	1	6	1	2	2	5	2	4	-1.0414	0.3182	-0.7332	0.1991	-0.5030
40	40	4	1	2	1	1	1	2	4	7	4	4	3	4	4	1	2	4	2	2	5	5	4	1	7	1	2	3	5	4	4	-0.6257	-0.4350	-0.9209	-0.0755	-0.7450

137	137	4	1	2	3	1	2	1	6	3	5	5	6	5	4	6	5	4	6	6	6	6	2	5	3	4	4	3	5	5	3	1.35975	-1.2205	-0.3995	-0.1194	0.0297
138	138	4	1	2	3	1	2	2	6	5	5	6	6	5	3	5	2	6	5	6	4	2	6	5	1	6	6	6	6	4	5	2.10655	0.7117	-0.9603	0.2970	0.6750
139	139	4	1	2	3	1	2	1	6	4	4	6	3	1	3	6	3	5	4	5	6	2	5	3	3	3	5	6	4	2	6	0.61463	0.8629	0.4534	-1.0915	-0.3918
140	140	4	1	2	3	1	2	1	6	6	5	4	7	2	2	6	4	6	4	6	5	2	4	3	5	4	4	6	4	3	5	0.79282	-0.1360	0.3785	1.0053	-0.3789
141	141	0	0	0	3	2	2	2	7	1	4	4	1	5	2	6	3	2	7	7	7	2	4	1	4	2	2	5	4	4	6	0.12972	0.9041	0.9186	-3.0339	0.3059
142	142	0	0	0	3	2	2	2	7	6	4	5	7	2	1	6	4	6	4	5	4	4	4	3	4	3	3	3	5	4	5	0.49890	-0.8147	0.3063	1.4472	-0.0679
143	143	0	0	0	3	2	2	2	4	7	4	5	2	4	2	7	2	4	5	5	5	5	4	3	4	4	6	3	3	3	7	0.94180	-0.5231	0.1340	-0.4166	1.4943
144	144	0	0	0	3	2	2	1	6	6	4	4	6	2	2	6	3	7	4	6	6	4	5	2	6	6	6	6	4	3	4	0.57989	-0.3810	1.2985	0.6837	-0.9526
145	145	0	0	0	3	2	2	1	4	5	4	4	7	2	2	4	2	5	5	4	4	4	4	2	5	4	3	3	4	3	4	0.19241	-0.3959	0.3717	0.3210	-0.1665
146	146	0	0	0	3	2	2	2	4	3	4	7	5	6	2	4	6	7	4	5	6	4	4	4	3	6	7	7	1	4	1	2.33946	-1.0367	-0.0290	-0.5553	-2.6380
147	147	0	0	0	3	2	2	2	5	5	4	4	7	1	3	6	2	5	4	4	4	4	4	1	6	1	2	3	4	3	3	-0.47156	-0.2438	0.4459	0.5127	-0.9893
148	148	0	0	0	3	2	2	1	7	5	7	7	7	7	1	7	1	7	7	7	7	1	7	1	1	7	7	7	1	1	7	2.54409	2.6195	-0.1616	-0.3295	1.0510
149	149	0	0	0	3	2	2	1	3	2	4	5	6	5	3	4	6	6	4	5	3	5	4	2	4	6	6	3	5	4	4	1.23658	-1.4465	-0.4063	-0.5003	0.1833
150	150	0	0	0	3	2	2	1	7	5	4	4	6	2	1	3	3	1	7	6	4	6	4	1	4	3	1	7	3	2	7	0.08949	0.4906	0.2180	-0.4135	0.7170
151	151	1	1	2	4	1	2	2	7	6	6	7	5	1	2	5	1	6	5	7	3	2	6	4	5	4	5	6	6	4	7	1.13102	0.9724	-0.3876	1.2458	1.4113
152	152	1	1	2	4	1	2	2	6	6	1	2	6	7	2	3	3	6	6	7	7	4	5	3	4	5	4	1	6	4	6	0.19336	-0.9830	1.3976	-0.5347	0.3146
153	153	1	1	2	4	1	2	1	6	6	5	4	6	4	3	6	2	2	6	5	4	2	4	6	1	6	6	6	1	2	3	2.29418	0.6928	-1.1902	0.0183	-0.1960
154	154	1	1	2	4	1	2	1	6	6	5	6	7	2	2	6	2	6	5	6	7	2	6	2	2	6	5	6	3	5	5	1.25220	0.0305	1.1291	0.9354	-0.4691
155	155	1	1	2	4	1	2	2	3	7	3	7	7	1	1	3	3	1	3	7	7	5	5	1	7	4	7	1	4	6	6	-0.32649	-2.4048	2.2940	1.3070	0.6600
156	156	1	1	2	4	1	2	2	4	5	3	1	1	3	1	6	4	6	4	5	7	4	4	1	3	5	7	1	5	6	7	-0.00534	-2.1266	2.1722	-1.0363	1.0405
157	157	1	1	2	4	1	2	1	6	7	4	4	6	1	1	7	3	6	4	6	5	1	6	1	6	4	2	4	6	3	7	-0.28464	0.2165	1.2967	0.9000	0.6006
158	158	1	1	2	4	1	2	2	6	3	4	4	6	2	2	3	2	3	6	6	5	4	5	2	4	5	5	6	4	2	4	0.41754	0.6663	0.6167	-0.9276	-0.4110
159	159	1	1	2	4	1	2	1	5	6	4	5	3	2	2	6	2	3	4	6	6	2	6	2	2	5	5	6	5	2	4	0.61630	0.7890	0.6401	-0.4393	-0.3768
160	160	1	1	2	4	1	2	1	4	6	5	4	5	2	2	3	3	4	4	5	6	3	5	2	5	5	6	5	3	3	4	0.54451	-0.1947	0.5559	0.0631	-0.4551
161	161	2	1	1	4	1	2	2	6	6	4	7	6	2	2	6	2	6	4	5	5	3	4	1	3	3	2	5	4	4	4	0.56304	0.0094	0.2639	0.7731	-1.1824
162	162	2	1	1	4	1	2	1	5	5	4	6	7	2	1	6	2	5	5	7	6	4	4	6	5	4	4	3	3	4	5	0.92334	-0.9793	1.1654	0.9372	0.0881
163	163	2	1	1	4	1	2	1	5	2	4	7	3	3	3	4	1	7	6	7	5	2	4	2	3	6	4	6	5	1	7	1.06100	1.6017	-0.0520	-1.9637	0.3271
164	164	2	1	1	4	1	2	2	5	3	4	5	5	2	3	5	3	3	5	6	5	2	5	2	2	5	5	2	4	2	5	0.63453	0.5163	0.2883	-1.2449	0.5093
165	165	2	1	1	4	1	2	1	6	5	4	4	6	2	2	4	3	5	4	3	5	5	4	3	6	4	4	6	3	3	3	0.37333	-0.4075	0.2898	0.4219	-1.5332
166	166	2	1	1	4	1	2	1	3	5	4	6	1	6	3	4	6	6	4	7	5	4	4	2	3	5	6	2	1	4	7	1.70393	-1.2037	-0.3069	-1.2493	0.8999
167	167	2	1	1	4	1	2	2	5	5	4	6	7	7	3	7	3	5	6	7	7	1	6	4	4	4	6	3	4	2	7	1.40111	0.7691	0.3388	-0.5870	1.2326
168	168	2	1	1	4	1	2	2	7	6	7	5	2	4	1	7	2	7	7	7	7	2	6	1	2	6	6	7	2	2	2	1.73022	1.9070	0.3106	-0.7489	-0.9607
169	169	2	1	1	4	1	2	1	7	7	7	6	7	1	6	7	1	7	7	7	7	1	7	1	7	2	3	3	4	3	7	0.11525	1.8818	0.4474	0.9793	1.1706
170	170	2	1	1	4	1	2	2	7	7	4	2	4	1	5	4	1	1	4	3	6	4	6	1	5	2	3	5	6	2	4	-0.96934	1.2516	-0.0387	-0.6202	-0.3416
171	171	3	1	1	4	1	2	1	6	7	6	3	7	1	5	6	2	7	4	6	5	2	6	1	7	6	3	3	5	4	5	0.11399	0.2622	0.2750	1.5075	0.4671
172	172	3	1	1	4	1	2	2	7	7	4	4	7	2	3	5	3	3	3	4	4	5	5	2	6	3	3	2	5	2	6	-0.26083	-0.0041	-0.3049	1.0411	0.8148
173	173	3	1	1	4	1	2	2	3	3	3	5	6	5	1	6	6	5	5	5	6	2	5	5	2	7	7	7	3	4	7	1.99866	-1.2155	1.0381	-0.8387	0.2922
174	174	3	1	1	4	1	2	2	6	6	4	3	6	5	6	5	3	5	3	3	5	4	4	5	3	3	6	6	5	5	6	1.20173	-0.6459	-1.1137	0.4613	0.1714
175	175	3	1	1	4	1	2	1	5	4	5	5	3	3	2	6	4	2	5	3	5	6	5	2	6	2	5	3	5	2	3	-0.05184	0.1281	-0.0290	-1.0455	1.3881
176	176	3	1	1	4	1	2	1	2	7	4	2	3	4	2	3	3	3	3	3	4	5	4	6	2	4	3	1	4	4	7	0.73692	-1.5519	-0.8627	-0.0828	1.8772
177	177	3	1	1	4	1	2	2	7	7	5	6	7	1	1	6	1	7	7	7	6	1	6	3	2	3	7	7	2	2	7	1.36382	1.3454	1.1044	0.8110	0.1571
178	178	3	1	1	4	1	2	2	6	7	4	5	5	2	3	4	2	4	4	5	4	3	4	2	6	3	3	2	4	3	4	0.07764	0.0027	-0.3112	0.6786	-0.3007
179	179	3	1	1	4	1	2	1	6	7	6	5	7	1	2	6	2	6	3	5	4	2	7	1	7	4	4	3	6	1	5	-0.09595	1.2646	-0.0444	1.3450	0.6599
180	180	3	1	1	4	1	2	1	1	2	2	4	1	4	4	4	5	1	3	2	4	6	4	2	6	2	4	2	4	5	6	-0.32756	-2.0531	0.1437	-2.3882	0.6246
181	181	4	1	2	4	1	2	1	7	7	3	6	7	1	2	7	2	7	6	6	7	2	5	5	2	7	2	7	4	3	5	1.23450	0.2910	1.2544	0.9438	-1.1583
182	182	4	1	2	4	1	2	1	6	7	1	5	7	1	1	7	3	6	6	7	6	2	7	2	2	5	7	7	4	3	4	0.70595	-0.2460	2.6066	0.3150	-1.6258
183	183	4	1	2	4	1	2	1	5	5	4	6	4	5	2	5	3	6	4	5	5	3	4	4	3	6	6	6	3	4	6	1.83113	-0.4156	-0.2894	-0.1305	-0.0062
184	184	4	1	2	4	1	2	[illegible]	[illegible]	7	4	6	7	7	2	6	2	6	4	7	5	1	6	6	1	5	7	7	2	3	4	2.66252	0.0129	-0.0242	0.4055	-0.7226

85	185	4	1	2	4	1	2	6	5	2	4	3	6	3	2	6	2	6	7	7	5	4	5	3	6	2	3	3	5	3	6	-0.02118	-0.0743	1.1347	-0.0879	0.9339
86	186	4	1	2	4	1	2	1	3	7	2	2	5	6	2	6	5	3	3	5	5	5	4	5	3	6	6	2	3	6	6	1.28256	-3.1533	0.6225	0.3774	0.9076
87	187	4	1	2	4	1	2	1	6	6	4	5	7	4	2	6	3	6	6	7	6	1	6	3	5	3	5	4	5	2	4	0.65647	0.7826	0.7839	0.1869	-0.3815
88	188	4	1	2	4	1	2	2	7	5	1	7	7	5	1	6	1	7	7	7	7	1	5	5	1	7	7	7	1	4	4	2.27785	-0.0342	1.6711	-0.1237	-2.1141
89	189	4	1	2	4	1	2	2	7	5	6	6	7	1	2	6	2	6	5	7	6	5	5	5	5	6	3	2	5	2	7	0.73024	0.4000	0.3674	1.1058	1.6815
90	190	4	1	2	4	1	2	2	3	5	4	5	5	1	1	4	1	7	6	7	7	1	7	7	1	6	6	5	2	4	5	1.60788	-0.1424	1.6806	-0.1594	-0.3529
91	191	0	0	0	4	2	2	2	5	6	4	4	6	2	1	5	3	7	5	7	5	3	4	3	5	4	5	3	4	3	4	0.55612	-0.6469	1.0723	0.6981	-0.4217
92	192	0	0	0	4	2	2	1	4	7	7	4	7	1	1	7	4	1	7	7	7	7	4	1	7	4	7	1	7	4	7	-0.29702	-1.3634	1.6918	1.2928	3.4111
93	193	0	0	0	4	2	2	1	6	6	2	6	5	3	3	6	4	5	4	5	6	1	5	6	4	3	5	5	3	4	5	1.11956	-0.5484	0.6502	0.1170	-1.2190
94	194	0	0	0	4	2	2	2	7	7	4	7	7	1	1	7	1	4	7	7	7	2	5	7	3	6	7	6	6	2	7	1.40005	0.6748	1.1522	0.9754	1.0486
95	195	0	0	0	4	2	2	2	3	4	3	5	4	6	3	5	5	5	4	6	4	5	2	7	4	7	7	3	1	5	4	2.39629	-2.5088	-0.4235	-0.1996	-0.1639
96	196	0	0	0	4	2	2	2	5	5	5	3	6	1	2	5	2	1	5	6	5	5	5	2	6	3	6	2	5	3	6	-0.36798	-0.6543	1.0830	-0.0773	1.9489
97	197	0	0	0	4	2	2	2	6	3	4	5	6	5	3	6	3	5	4	7	6	2	7	2	5	3	5	7	5	2	5	0.58722	-1.2470	0.5486	-1.1411	-0.3877
98	198	0	0	0	4	2	2	1	6	7	5	7	7	1	2	6	4	6	4	7	6	2	5	5	5	5	4	6	3	4	5	1.33366	-0.4168	0.6571	1.7642	-0.5901
99	199	0	0	0	4	2	2	1	7	7	7	5	7	1	1	4	1	5	7	7	7	1	7	1	7	7	4	6	6	1	6	0.20934	2.2263	0.9088	0.8391	0.9885
100	200	0	0	0	4	2	2	1	5	4	4	5	7	2	1	5	2	3	7	7	6	1	6	2	2	3	5	4	5	2	7	0.36336	0.9757	1.3186	-0.8151	1.1630
1	201	1	2	2	0	0	0	2	6	5	5	4	3	5	6	5	2	2	6	4	5	3	5	1	7	1	1	5	6	2	7	-0.5195	-1.6232	-1.1423	-1.5669	0.5569
2	202	1	2	2	0	0	0	2	3	3	3	2	2	2	6	2	6	1	2	2	2	6	2	1	7	1	1	2	7	1	6	-1.3543	-1.1301	-0.8540	-1.5716	0.0701
3	203	1	2	2	0	0	0	1	6	5	5	7	5	6	3	1	3	6	7	7	6	1	6	5	3	5	7	7	2	2	5	2.0170	0.8874	-0.9285	-0.4304	-1.3466
4	204	1	2	2	0	0	0	1	5	4	3	2	6	1	4	3	2	1	2	5	4	5	5	1	6	4	1	2	7	3	7	-1.1702	-0.0028	-0.1214	-0.6768	1.6758
5	205	1	2	2	0	0	0	2	7	7	5	6	2	6	7	6	1	2	6	6	4	2	7	6	3	5	4	7	5	2	4	1.4392	2.6180	-2.6591	-1.3443	-0.7477
6	206	1	2	2	0	0	0	1	6	7	5	6	6	5	2	7	2	4	4	7	6	1	6	3	2	4	5	6	5	2	4	1.0647	1.3169	-0.0535	0.0382	-0.4353
7	207	1	2	2	0	0	0	2	7	1	4	7	7	1	1	7	1	2	4	6	7	3	4	1	6	2	1	7	7	1	6	-0.6771	1.3694	1.6108	-1.7130	0.1222
8	208	1	2	2	0	0	0	1	5	3	5	6	4	7	3	6	6	5	5	5	3	2	5	5	4	6	6	5	3	5	4	2.2198	-0.4225	-1.3953	0.0368	-0.1976
9	209	1	2	2	0	0	0	1	3	1	2	4	1	3	7	2	5	2	1	3	2	6	1	2	4	3	2	2	4	4	4	0.0407	-2.1666	-1.1260	-1.6461	-1.0823
10	210	1	2	2	0	0	0	2	5	4	3	2	2	5	5	2	4	2	3	3	2	4	3	1	4	1	1	4	5	5	5	-0.1284	-0.6412	-1.8678	-0.8477	-0.2545
11	211	2	2	1	0	0	0	1	2	6	2	3	1	7	7	3	7	4	4	4	2	7	2	3	4	4	3	3	2	4	4	1.1374	-2.7454	-1.3202	-0.3542	-1.0698
12	212	2	2	1	0	0	0	1	4	5	3	3	1	2	6	2	4	5	3	2	3	6	4	1	5	2	3	2	4	4	4	-0.2711	-1.4476	-0.4971	-0.3146	-0.9294
13	213	2	2	1	0	0	0	2	7	5	5	3	7	2	2	5	1	4	5	6	5	2	5	1	7	2	3	6	6	3	5	-0.4053	1.2226	0.4247	0.1243	0.2492
14	214	2	2	1	0	0	0	2	3	6	3	1	3	1	7	1	2	1	3	1	4	5	4	1	7	1	2	1	5	3	5	-1.3971	-0.5985	-0.7093	-0.7870	-0.1478
15	215	2	2	1	0	0	0	2	3	6	2	3	4	6	2	5	3	3	2	2	6	3	1	7	1	1	5	5	4	3	-0.4353	-1.3115	-1.0878	-1.2166	-1.3692
16	216	2	2	1	0	0	0	1	7	5	6	1	7	1	4	5	1	1	4	4	7	2	6	1	7	1	1	6	6	1	2	-1.2307	2.2263	0.2291	-1.0980	-1.4497
17	217	2	2	1	0	0	0	2	7	4	3	3	6	2	1	4	4	3	4	2	6	5	4	1	6	2	1	4	6	3	6	-0.8596	-0.3958	0.9198	-0.1697	0.2798
18	218	2	2	1	0	0	0	2	4	2	3	2	2	3	3	2	3	4	5	5	5	6	4	3	4	3	2	5	4	3	3	0.2379	-0.9075	0.7032	-1.8998	-1.3706
19	219	2	2	1	0	0	0	1	5	5	4	2	6	2	5	5	3	2	4	4	6	4	5	2	6	3	2	3	6	2	6	-0.7443	0.3329	0.1888	-0.7700	0.7779
20	220	2	2	1	0	0	0	1	5	5	4	5	6	3	3	5	2	3	4	3	6	5	5	2	5	1	2	3	5	2	3	-0.4603	0.2088	0.4472	-0.2841	-1.0760
21	221	3	2	1	0	0	0	2	6	4	5	5	6	3	2	6	2	3	4	5	5	2	5	3	2	4	3	5	5	4	4	0.7077	0.7552	-0.3957	-0.1408	-0.1128
22	222	3	2	1	0	0	0	2	6	6	4	5	6	3	3	5	3	5	4	4	5	3	5	3	5	3	4	4	5	3	4	0.2840	0.0968	0.0712	0.6707	-0.5821
23	223	3	2	1	0	0	0	2	4	4	4	5	4	5	5	5	4	5	5	5	5	5	5	1	5	5	4	5	6	4	7	0.5345	-0.3964	-0.2269	-0.6287	1.2443
24	224	3	2	1	0	0	0	2	5	6	2	2	4	3	6	2	5	2	4	4	6	2	5	2	4	4	4	6	6	4	6	0.1129	-0.2732	-0.4128	-0.9233	0.1304
25	225	3	2	1	0	0	0	1	5	7	4	5	3	3	4	4	4	5	5	3	6	3	5	3	5	3	5	4	4	3	5	0.4728	-0.3017	0.1707	0.1607	-0.5573
26	226	3	2	1	0	0	0	1	3	4	3	1	3	3	6	3	5	3	3	2	3	5	3	3	5	3	3	2	5	5	5	-0.0534	-1.6999	-1.1021	-0.3647	0.3518
27	227	3	2	1	0	0	0	1	3	3	4	3	6	2	6	2	2	2	3	4	6	4	4	3	7	5	2	2	7	3	5	-0.7067	-0.1938	-0.1531	-0.8931	0.5157
28	228	3	2	1	0	0	0	2	3	2	3	2	4	1	5	2	4	3	3	2	4	7	4	1	5	2	2	2	6	4	6	-0.8890	-1.4291	0.0746	-1.0696	0.7385
29	229	3	2	1	0	0	0	1	4	1	4	4	1	4	5	2	3	1	3	4	6	4	4	1	6	2	6	5	4	4	6	0.1094	-0.3027	-0.2544	-2.5466	0.0933
30	230	3	2	1	0	0	0	1	5	6	5	5	4	2	4	5	2	2	4	3	6	3	6	2	7	3	3	5	3	3	-0.2259	0.8777	-0.2392	-0.3719	-0.9243
31	231	4	2	2	0	0	0	1	6	7	6	7	7	6	2	7	4	5	6	5	4	2	5	6	2	6	7	7	5	7	7	2.4016	0.2980	-1.9642	2.1443	-1.8605
32	232	4	2	2	0	0	0	2	7	1	6	7	6	2	1	7	1	2	5	7	6	1	6	4	1	7	6	7	5	4	5	1.5840	-1.7819	-0.0794	-1.3027	0.6626
33	233	4	2	2	0	0	0	2	6	5	3	4	3	4	4	4	1	3	5	4	2	4	6	2	5	4	4	4	4	3	5	0.3811	0.6635	-1.0769	-0.8628	-0.0888
34	234	4	2	2	0	0	0	2	7	1	5	5	6	5	2	7	2	3	6	6	2	1	6	5	2	5	4	7	6	5	6	1.5945	1.6842	-1.8820	-0.9061	1.3741
35	235	4	2	2	0	0	0	1	7	5	6	7	6	2	2	7	2	7	6	7	1	4	7	6	5	6	7	7	2	7	4	2.3353	0.3390	-1.2508	2.1937	0.4120
36	236	4	2	2	0	0	0	1	6	5	4	4	7	3	5	4	4	2	3	6	7	3	4	4	2	2	6	6	6	4	4	1.6518	0.4303	-1.0769	-0.6945	1.1164
37	237	4	2	2	0	0	0	1	3	2	2	2	3	2	6	6	5	2	3	3	2	5	3	2	4	3	4	2	5	4	7	-0.0035	-1.5871	-0.6121	-1.4828	1.4269
38	238	4	2	2	0	0	0	2	7	6	4	2	3	4	2	6	4	2	4	5	3	2	6	2	2	5	6	6	5	5	6	1.0170	0.5198	-1.3656	-0.3746	1.0656
39	239	4	2	2	0	0	0	1	7	6	5	4	6	5	5	7	1	3	7	7	4	1	7	4	5	4	4	4	6	5	7	0.8070	1.9192	-1.7277	0.1263	2.2798
40	240	4	2	2	0	0	0	2	6	5	6	7	5	6	1	6	1	6	6	7	6	1	6	6	1	6	6	6	3	4	6	2.2878	1.0833	-0.3646	0.2548	0.4756