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Are Musical Themes Better than Visual Images as ESP-Targets? An Experimental Study Using the Ganzfeld Technique

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ABSTRACT: The ability to detect emotion in music has many educational and practical benefits. However, there appear to be few studies reported in the literature in which sounds have been used as stimuli in extrasensory tests. The present study was undertaken in order to compare auditory with visual stimuli and to explore whether psychological factors which appear to be favourable in music tests are related to ESP. Musical styles were chosen as targets in this experiment. Fifty-four participants attended two GESP sessions (each on a different occasion) at the Institute of Paranormal Psychology in Buenos Aires, Argentina. The first author (AP) was the experimenter, who received each participant, and the second author (JV) was the blind "sender" for all of the sample. A CD–R containing 3,500 high–resolution colour pictures and another CD containing 112 themes in MP3 format were used, on the two different occasions.

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Stimulus targets were randomly selected. Both conditions yielded significant results (psi-hitting)—the musical-target condition (*p* = .008) and the visual-target condition (*p* = .001), the latter somewhat more significant, but the difference between the two was not significant.

INTRODUCTION

The psychologist C. G. Jung maintained that "music expresses, in some way, the movement of the feelings (or emotional values) that cling to the unconscious processes" (Budd, 1992). The words used to describe feelings very often have a slightly but significantly different meaning for each individual. For Clarke (1999), feeling was the function of consciousness which tells one how and to what extent a thing is important or unimportant for us.

The ability to detect emotion in music has many educational and practical benefits (Balkwill & Thompson, 1999; Gabrielsson, 1982; Meyer, 1956). According to Leonard Meyer (1956) and other pioneer psychologists, it is theoretically possible to detect the emotion in music if these emotions are contained entirely within the context of the music itself. Therefore, music has a very strong, very definite physiological and psychological effect on people (Smith, 1999). Disharmonic music causes a number of negative behaviours (Dimberg, 1987). Gabrielsson (1982) places the responses into three categories: experiential ("various perceptual, cognitive, and emotional variables", p. 160), behavioural (actions performed as a result of the rhythm), and physiological. More specifically, affected individuals are rarely aware of all of their responses, such as changes in heart rate or respiration, or even toe tapping.

Among many other stimuli used in parapsychological studies of extrasensory perception, there are coloured cards, Zener or ESP symbols, and words emotionally or non-emotionally charged. However there appear to be few studies reported in the literature in which *sounds* have been used as stimuli in ESP tests. More psi studies using sound stimuli would be desirable. First, sounds are fundamental to the normal method of human communication. Second, there is the possibility that there are systematic variables present in the ESP tests with visual stimuli which have not as yet been discovered and which might be isolated in tests of ESP with sound stimuli or by other variations in procedure. Third, the use of sound stimuli in a controlled experimental study should serve to increase our knowledge of the problem of extrasensory perception.

Reports of ESP experiments using music as targets were published by Shulman (1938) and George (1948). Keil (1965) hypothesised that the music might provide a relatively dominant and stable effect that would transcend the influence of subject-experimenter relationship. He designed an experiment in which five pieces of music were selected for each participant, representative, meaningful, and important to him or her. The results were significant (*p* = .01). The author pointed out that it is not certain what effect the music had in producing the results, because of the fact that this was a GESP test and he himself might have been the "agent."

However, it seems surprising that no further investigations into the use of sounds as targets have been conducted. The present study was undertaken to compare auditory with visual stimuli and to explore whether psychological factors which appear to be favourable in music tests are related to the ESP task. However, it is difficult to define the psychological variables in music appreciation adequately, but terms such as "intense, very personal, and sometimes highly emotional" would probably find agreement with most who are interested in music at all.

Psi phenomena have had a long tradition linked to altered states of consciousness (Alvarado, 1998). Bertini, Lewis, and Witkin (1964) exploited this association to develop an "experimental-hypnagogic" technique to facilitate the study of hypnagogic imagery. Ganzfeld stimulation, such as reduction of the sensory noise level through regulation of perceptual input and deployment of attention toward internal mentation, could serve to "carry" psi impressions. One of the first investigators to introduce the use of the Ganzfeld in parapsychology was Charles Honorton (Honorton and Harper, 1974), who believed that the experimental production of hypnagogic imagery could facilitate the reception and recognition of extrasensory perception in the laboratory. This idea arose because of the similarity of the hypnagogic state (a state of dream-like consciousness experienced before falling asleep) to certain altered states of consciousness traditionally associated with spontaneous psychic experiences. Stanford had hypothesised elsewhere (1979, 1980) that the Ganzfeld favours ESP because it reduces cognitive constraints and that some of this reduction depends upon the use of noise during the Ganzfeld.

The first study carried out using musical themes as ESP targets was by Melvyn J. Willin (Willin, 1996a, 1996b). He used pairs of deliberately selected people known for their musical appreciation (music students). His first 50 trials produced a hit rate of 32%. But in spite of the fact that that experiment did not yield significant results after 100 trials, our aim consisted in comparing the results using musical targets for a group of participants who had already undergone the conventional Ganzfeld experiment using visual images as targets. We anticipated, in advance, that this experiment would offer support for the notion that Ganzfeld stimulation is psi-conducive, and we expected some kind of difference between scores on the visual targets and on the musical targets.

METHOD

Participants

The sample was recruited from an earlier study using visual targets (Parra & Villanueva, 2003a; Parra & Villanueva, 2003b): out of 138 persons approached, just 54 agreed to participate again (31 [57.4%] females and 23 [42.6%] males). Age ranged from 23 to 76 years old (Mean = 46.83; *SD* = 12.70). They were students of parapsychology at our Institute in Buenos Aires. Appropriate informed consent to the experimental procedure was obtained, using language reasonably understandable by the participants.

Participant Orientation

Participants were recruited by mailing announcements (pamphlets) using an Institute mailing list. A Participation Information Form offered a brief explanation of the Ganzfeld procedure and encouraged prospective participants to have an interview with us in order to gain more information about the technique and visit the Ganzfeld lab. An announcement was also placed in the Internet (*www.alipsi.com.ar/ganzfeld.htm*). Paranormal belief was strong in this population.

Experimenter and Sender

The first author (AP) was the experimenter, who received each participant, and the second author (JV) was the sender for the entire sample. The sender, who had taken part in other ESP experiments, also knows meditation and imagery–techniques and he is a yoga trainer as well. The sender could not hear the receiver's impressions, which were tape-recorded by the experimenter for analysis following the Ganzfeld session.

Layout and Equipment

The Ganzfeld lab was the same as in the earlier study. The rooms utilized in this experiment are indicated as A, B, C and E (A = Ganzfeld lab; B = experimenter's room; C = sender's room for the target-hearing period; and E = sender's room for non-target-hearing period). It is important to point out that the Ganzfeld lab is a safe, sound-isolated room. Also, the Ganzfeld room was at a distance from the sender's room and separated by about 30 m. Figure 1 shows the placement of the sender and the receiver. The receiver's room is lit by a white bulb that goes on before and after the Ganzfeld experience starts and ends. A 70-watt red filtered flood-light, located approximately 2 m in front of the receiver's face, is adjusted in intensity until the receiver reports a comfortable, shadow-free, homogeneous visual field. The level of white noise is similarly adjusted:

the receiver is informed that the white noise should be as loud as possible without being annoying or uncomfortable.

The receiver remained lying down on a chaise longue, which permitted the receiver to remain comfortable. The experimenter kept the receiver company while he prepared the receiver for visual and auditory Ganzfeld stimulation. Translucent hemispheres (two halves of a ping-pong ball) are taped over the receiver's eyes and firmly fastened to a cotton mask with transparent adhesive tape.

A CD player (Sanyo MCD–X97) connects the receiver to the auditory stimulus by means of headphones to their ears. The receiver could not adjust the volume of the CD by themselves.

AP controls the duration of the Ganzfeld session using a chronometer which synchronises both the digital counter of the CD's revolutions and the computer's real-time clock.

The computer peripherals used by the sender included a real-time clock, a 56X-CD-R player supporting digital audio extraction, sound-proofed headphones adjusted by the sender, and a Pentium III processor with sound card computer. MP3 provides high quality audio in one-tenth the file-size. We used an audio system (AudioCatalyst™) which allows us to make a digital copy on CD-R and transform each sound track into an MP3 file in one easy step. To play the musical theme, an MP3 player (Xing Technologies Co.™) was also used. The high-quality evolved sound did not permit any sensory cues from being transferred from the headphones in the sender's room to the receiver's room.

Relaxation exercise

Receivers underwent a 9–minute recorded relaxation exercise before the sending period, in a style similar to a hypnotic induction procedure. The relaxation exercise includes progressive relaxation exercises and autogenic phrases (Jacobson, 1974) recorded using the voice of the experimenter (AP). The instructions and relaxation exercises were delivered in a slow, soothing but confident manner. The auditory stimulation was given by a 33-minute, white-noise CD generated for this experiment.

Test instructions

Explanations of the experiment were given to the participants. We told them that we were conducting a telepathy experiment in which we had musical themes as targets; following on from the experiment with visual targets, that both type of targets possibly stimulate psychic abilities in people, and that we were now exploring both, so that we could evaluate their relative importance in psychic performance.

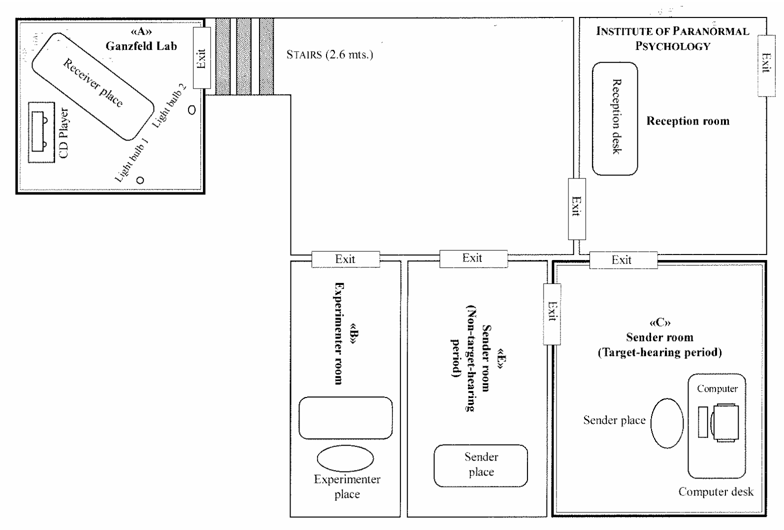

Figure 1. Laboratory layout

Type of Targets
Musical. A CD-R clip-of-music was specially designed. CD–R contains 96 well-differentiated themes on an MP3 system (e.g., African–mahori, Classical, heavy Rock, and Brazilian-Caribbean music styles), which were clustered into 24 groups of four themes each. The target-pool selector was AP, who had no contact with the sender, JV, during the selection process. There were two steps to building the musical themes pool before the Ganzfeld session. The first step was to select one style of theme out of hundreds of themes (from the same style: e.g., Brazilian-Caribbean); and the second step was to cluster the theme style into groups (four potential targets, each target being from one style). All of these steps were randomised (approximately one hundred themes each style). Each style was also coded using random number tables. JV randomly selected one of the four potential targets for hearing at the same time as the participant underwent the Ganzfeld stimulus. Once designed, AP delivered to the sender the CD-R. We decided to use the CD because of four reasons: (1) The MP3 digital system record music is easy to handle; (2) themes are appropriately clustered in such a way that it facilitated the randomisation task; (3) the musical-targets were characterised by their diversity and auditory attractiveness—designed to be a good target for a GESP experiment; and; (4) avoided any manipulation of the target, mainly during

the target-hearing and the judgment process.

Visual: In the previous experiment visual targets had been used (Parra & Villanueva, 2003a,b): A CD–R contains 3,500 high–resolution, jpg pictures (taken from a CD-R clip-art) for computer. Ten groups of well-differentiated targets, such as animals, icons, foods, people, landscapes, religion, scenic pictures, structures, and humorous cartoons, were re-clustered into six subgroups of pictures each. Each subgroup contains 200 pictures, which are numbered from 1 onward. One image-target for each receiver was randomly selected by the sender. We decided to use the CD for five reasons: (1) picture subgroups are easily clustered; (2) the randomisation process was facilitated; (3) picture-targets were characterised by their diversity and visual attractiveness which served as good targets for a GESP experiment; (4) avoided any sensory (visual) cues; and (5) avoided any target manipulation, mainly during target-viewing and the judgment process.

Target security

AP had no contact with the sender during the selection process. JV made the selection of the targets for each receiver (each session) individually, prior to each session, but he kept a register of the names of each receiver and the selection of the group, subgroup and the picture-targets. This paper-and-pencil register was never in contact with AP (a security copy was kept by JV in a safe place unknown to the experimenter). During each session, JV kept the register in a closed envelope with him at all times until after the judging procedure: he then delivered it to AP. When JV prepared only a single target, he remained alone in the sender's room, separated from the experimenter. This procedure protected against the (unlikely) possibility of any leaking of target information to AP. The experimenter did not access the room of the sender (JV) before and during the Ganzfeld session.

This was a blind experiment because the experimenter, who was in contact with the receiver during the pre-test and post-test period, was not aware of which picture-target the sender had selected. The experimenter also did not show the sender's room to the receiver before the Ganzfeld test. The experimenter had no contact whatsoever with the sender either during the selection process or during the observation of the picture-target, since the experimenter left the room before the sender selected the picture-target.

When the Ganzfeld session concluded, JV used the same target selection procedure to create the target (visual or musical) set, that is, target and three decoys for the judging procedure. AP was unaware as to the details of this procedure. A randomisation procedure was carried out by the sender once the three images/music for the judging procedure had been selected. To avoid the tendency to select pictures placed on the high or low and left or right on the computer screen, the sender randomly assigned a value from 1–4 for each the places of the picture-target. AP was also unaware of the details of this procedure.[1]

To avoid sensory cues as to the musical-target identity, the experimenter had a PC program for displaying four audio-clips at the same time. The musical-targets were previously randomised before the hearing of them. Four themes of different music style, numbered from 1–4, were inserted in each group. JV used the same target selection procedure to show the audio-clip set for the judging procedure. The details of this procedure were unknown to AP.

A sequence of (pseudo)random numbers obtained using StatPac Gold 4.5 to select the group of targets (target and three decoys) was generated. No participant had any contact with the sender before, during or after the Ganzfeld session. The distance between sender and receiver, as well as the walls of the Institute, and the design of the Ganzfeld lab are optimal with rooms safely isolated so that one cannot infer that both AP and JV could have communicated any sensory clues—intentionally or unintentionally.

Experimental procedure

As mentioned above, out of 138 participants who underwent a Ganzfeld session using visual targets, just 54 of them underwent a session using musical targets—a few months after—so that the order of the experimental session was visual first, musical second, and were not counterbalanced. Moreover, people who underwent the musical target condition had some experience with Ganzfeld stimulation.

The experimenter engaged in conversation with each participant, so as to provide more information about the Ganzfeld technique. After that, and once the Ganzfeld stimulation began, he left the receiver's room, and he returned when the stimulation had ended. During the session, the experimenter remained silent in room B. After the receiver's stay in the Ganzfeld lab, the experimenter indicated the end using, twice, a caller (one–bip sound) to indicate to the sender the target-hearing/viewing period (indicating the beginning and end of the hearing/viewing period). The audio-target was heard by the sender, using headphones, for 23 minutes.

Each receiver was asked to verbalise their visual/auditory

[1] Photoshop 5.0 allows display of four pictures at the same time on the computer screen. The picture-targets were never printed on paper, so that fact also did not allow any sensory cues between the receiver and experimenter.

mentation as much as possible after the Ganzfeld stimulation. The sender left the sender's room, to go to another room, on the other side of the Institute, waiting a few minutes before meeting AP once the entire Ganzfeld experiment ended. The judgment procedure started once the receiver was seated in front of the computer screen.

Judgment procedure

Musical. The experimenter had a form used only by him. The receiver then heard the four potential targets (the actual target and three decoys), which are presented in one of four random sequences. The receiver, while hearing each candidate, associated to the item as though it were the actual target, describing emotional and sensational similarities between the item and the Ganzfeld whole-mentation (auditory, visual, emotional, or sensory). While the receiver was associating to each candidate, the experimenter pointed out potential correspondences that the receiver may have overlooked. A rank of 1 is assigned to the candidate which the receiver believes has the *strongest* similarity to their Ganzfeld mentation; a rank of 4 is given to the candidate which the receiver deems *least* like their Ganzfeld experience.

Visual. Like the musical targets, each receiver viewed the four potential targets (the actual target and three decoys on the computer screen), which were presented in one of four random sequences. The receiver, viewing each candidate, associated to the item as though it were the actual target, describing perceived similarities between the item and the Ganzfeld impression. A score of 1 is assigned to the candidate the receiver felt had the *strongest* similarity to their Ganzfeld impression; a score of 4 was given to the candidate the receiver felt was *least* like their Ganzfeld experience (Scores 2 and 3 were also allocated). The experimenter did not suggest any additional comments during the judging process.

The judging procedure—depending on each participant—lasted between five and ten minutes in both conditions. Forms were individually signed by each participant.

Both conditions: Three rating-scales were used following the Ganzfeld: (1) degree of mental activity; (2) vividness of imagery; and (3) effort to listen/perceive. They were all on a 0-99 scale. See Table 3.

RESULTS

First-rank scores represent high coincidence with the picture/musical theme chosen as potential target; fourth-rank scores represent low or null coincidence with picture/theme chosen as potential target in the judging procedure. The visual-target Ganzfeld condition (p = .002) gave results better than the musical-target Ganzfeld condition (p = .009), but the difference between both target conditions (visual vs. musical) was not significant (z score = –.392, p = n.s.). See Tables 1 and 2. It should be noted that the rate of first-rank hits, viz., 46.3%, is higher than in the original visual-target experiment (viz., 41.3%), and it is just possible that the present results are artifactual, if hitters in the first experiment were more inclined to volunteer for the musical experiment. Note also that correlations between the ESP-scores and the personality tests were non-significant.

Table 1.
Comparison of musical- and visual-target rank-scores: Distribution of scores (n = 54)

	1^{st}	2^{nd}	3^{th}	4^{th}	*z*-score	*p* (one-tailed)
Expected	25%	25%	25%	25%		
Observed Visual–Target	46.3	18.5	18.5	16.7	– 2.86	.002
Observed Musical–Target	35.2	27.8	25.9	11.1	– 2.37	.009

* A *negative z*-score indicates score position *above* mean chance expectation. First-rank is high coincidence; fourth-rank is low or null coincidence. Due to the fact that scores of 1 represent high coincidence *lower* scores indicate psi-hitting.

Table 2.
Comparison of musical- and visual-target conditions: Wilcoxon rank test (n= 54)*

Type of Target		*N*	Mean rank	Sum of ranks**	*z*	*p*
Musical	Musical target < Visual target	20	21.05	421.00	.392*	n.s.
Visual	Musical target > Visual target	22	21.91	482.00		
	Visual target = Musical target	12				
	Total	54				

* Wilcoxon *t* test was used using SPSS

** Statistical test was used following the "sum of ranks with many subjects" procedure (Kreiman, 1998, pp. 125-126).

Table 3.
Comparison of means for post-ganzfeld questionnaire item scores: First and second ganzfeld session

	First ganzfeld session (Visual target)		Second ganzfeld session (Musical target)	
FACTOR	Mean	SD	Mean	SD
MENTAL ACTIVITY (0 = structured; 99 = bizarre)	66.67	23.56	67.56	18.05
IMAGERY VIVIDNESS (0 = Low; 99 = High)	64.30	25.04	55.69	26.58*
EFFORT TO PERCEIVE MUSIC / IMAGERY (0 = Low; 99 = High)	35.42	28.74	38.59	27.07

Vividness of imagery was greater using visual targets than for musical targets, t (52) = 2.96, p = .005 (two-tailed)

DISCUSSION

This experiment studied a psi-conducive state (the Ganzfeld) using a GESP technique (telepathy) in a free-response test using musical styles as targets. We conclude that this experiment offers some support for the claim that Ganzfeld stimulation is psi-conducive. Both conditions, one using visual- and the other, musical-targets gave significant results, although note the caveat for the visual-target data.

However, we do not conclude that the good ESP results in our experiment using Ganzfeld induction were related to the use of a modified state of consciousness. We feel that the prior familiarity with the lab environment would lead to a reduction of the stress or anxiety typically caused by entering a potentially threatening or unknown situation. Linked with this point we feel it is important to use experienced participants in Ganzfeld research. Experienced participants are those who have had a prior Ganzfeld session (in this case, visual-targets), and therefore know what to expect from the experience. Thus, these results may be due to conducting Ganzfeld research with experienced participants, a situation which seems to produce a higher success-rate than research designs using only novices, or inexperienced participants (Honorton, Ferrari & Bem, 1990; Sargent, 1980; Sargent & Bartlett, 1982). Again, this result may be related to the higher degree of comfort and familiarity with a procedure that initially may seem strange or bizarre for the participant. This familiarity may contribute to the participant's ability to relax in a "safe" environment and facilitate a deconstruction of psychological barriers.

Comparing the principal indicators of the Ganzfeld experience in the first session (visual-targets) and the second session (musical-targets) we found a very small increase in participant mental activity (66.67 to 67.56), a significant decrease in the vividness of imagery (64.30 to 55.69)—probably due to the effect of the instructions given for each session—and a non-significant increase in the effort to perceive imagery (32.22 to 38.59). We asked ourselves if imagery vividness in Ganzfeld stimulation increases or decreases depending on the *nature* and not the *content* of the target, that is, being a visual image or a sound. In the same way that other studies have examined the content of the target (i.e., static images versus dynamic images), future studies should also examine differences in the content of the musical target (i.e., a musical theme vs. a monotonous sound).

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