Ganzfeld Psi Performance Within an Artistically Gifted Population

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ABSTRACT: We report an ESP Ganzfeld study with an exceptional population, students from the Juilliard School in New York City, a world-renowned conservatory for the performing arts. Twenty undergraduate Juilliard students each served as a receiver in a single telepathy Ganzfeld session at the Psychophysical Research Laboratories (PRL). The study utilized automated testing procedures described by Honorton, Berger, Varvoglis, Quant, Derr, Schechter, & Ferrari (1990). The Juilliard students achieved a significant success rate of 50%, double the chance expectation of 25% \( p = .014, z = 2.20 \). Students of music demonstrated the most outstanding performance; six of the eight musicians obtained direct hits \( 75\%, p = .0042, z = 2.63 \). No significant relationships were observed between ESP performance and either personality or creativity measures. As a group, the Juilliard students' performance was significantly superior to the PRL general population \( t = 2.09, 2-t, 239 \text{ df}, p = .038 \). We identify several significant differences in the two populations.

Frederic Myers (1903/1954) was among the first to make a connection between exceptional human abilities, such as genius, and psychic experiences. Based on his observations of spontaneous cases, he argued that

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2 This study was supported by the Mind Science Foundation (Schlitz) and the John E. Fetzer Foundation (Honorton). Honorton’s contribution was further supported by the American Society for Psychical Research (ASPR) and by the Parapsychology Foundation, Inc. (Mrs. Eileen Coly, President). Facilities for administering additional creativity assessments were provided to Schlitz by the ASPR. We wish to express our appreciation to Dr. Peter Rojcwicz, Professor of Humanities at the Juilliard School. Without his support and collaboration, the study would not have been possible. We also thank Diane Ferrari, who served as coexperimenter; George Hansen, who served as sender; and Diana Robinson, who scored the creativity assessments and offered many useful suggestions along the way. General appreciation goes to William Braud, Stanley Krippner, David Morse, Nancy Sondow, Jessica Utts, and the anonymous reviewers for their useful comments during various stages of this work.
genius and psi are characterized by an uprush from the subliminal mind to consciousness. Both, according to Myers, provide expressions of the same potential subliminal materials and the impulse to fulfill them through contacts with the outer world. In both cases, mental imagery is a mediating vehicle for the transition of information from the unconscious mind into conscious awareness.

Walter Franklin Prince (1928/1963) reported apparent psi experiences of many notable people. These included creatively gifted individuals such as Mark Twain, Robert Browning, Robert Schumann, Johann Wolfgang Von Goethe, and Emanuel Swedenborg. Like Myers, Prince’s anecdotal collection suggests a relationship between creative ability, unconscious mental processes, imagery, and psi experiences.

Drawing on the work of Freud, Gardner Murphy (1963) argued that:

> creativity and psychic experiences are twin expressions of a dynamic unconscious emotional and instinctual life. We have, then, a number of conceptions in the realm of psychical research which are curiously like a series of conceptions which have developed in the scholarly study of creative gifts. (p. 206)

Both, according to Anderson (1962), are elusive, spontaneous, and difficult to control. This appears to be due largely to the unconscious and preverbal nature of creativity and psi phenomena (Krippner, 1962–63).

Various authors have suggested that psi and creativity are facilitated by common personality states and social conditions. Based on a review of the literature, Krippner (1962–63) observed that both are more highly associated with academic achievement than they are with intelligence, that both are normal faculties which typify the young and healthy, and that both characterize persons who are open to experience and who are one with the environment (p. 55). According to Moriarty and Murphy (1967), both experiences are more likely in people with high self-esteem, empathy, and self-understanding. Further, both psi and creativity are characterized by a demand for openness to new and unusual experiences and tolerance for the unrealistic.

Anderson (1962) and Sondow (1986) point out characteristics of psi that resemble the stages of the creative process. These include preparation, incubation, illumination, and verification. It is the illumination phase, according to Sondow, that bears the closest resemblance to psi manifestations. The incubation phase is related to the idea that psi is first processed unconsciously. The preparation phase resembles issues of motivation, need, or demand. Anderson (1962) argues that both spontaneous psi experiences and man-made creative products usually have something to express—“a message, a feeling, some quality of experience—and a vehicle, a form by or through which that content or message is expressed” (p. 290). The verification phase of creativity is associated with the judging process, where an analytical mode of cognitive functioning is employed.
The relationship between creativity and psi functioning has also been explored in experimental investigations. According to Schmeidler (1988), 14 formal studies have been reported. While she does not provide the probability values associated with these studies, she notes that nine reported a positive relationship between creativity and psi, three obtained virtually no correlation, and two found a negative relationship. While efforts were usually made to measure creativity, the standardized assessments differ from study to study. As such, the investigators may not have measured the same underlying dimensions (Palmer, 1978; Sondow, 1987). In addition, there is the question of whether standardized creativity assessments are really measuring creativity at all. As pointed out by Hocevar (1981), each creativity evaluation method is problematic, revealing the complexity of creativity as a construct.

Not all of the psi and creativity studies have relied on standardized assessments of creativity. Four investigated psi abilities within artistically gifted populations. Subjects were professional artists or art students. These experiments provide the most direct test of anecdotal reports linking psi experiences to people known for their exceptional abilities.

Jackson, Franzen, and Schmeidler (1977) employed forced-choice psi testing procedures. Half of the subjects were unselected psychology students; half were music students. There was no overall evidence of psi and no significant difference between musicians and nonmusicians. The music students did, however, score higher on the psi task than the unselected students.

While useful, forced-choice procedures are often dull and repetitive. As such, they may not provide the best technique for examining the relationship of psi and creativity. Three experiments used selected subjects and free-response procedures. Because the free-response targets are more stimulating, they may be better suited for work involving highly creative individuals. Each of these studies supports the hypothesis that psi functioning is associated with exceptional human performance.

Moss and Gengerelli (1968) employed a telepathy design. Emotionally charged auditory and visual targets were used to enhance volunteers’ interest in the task. There were 38 artists and five professional “sensitives” in the sample of 144 volunteers. Stronger, though nonsignificant, psi performance occurred when sender-receiver teams included at least one artist. A post hoc analysis found highly significant psi performance for teams consisting of two artists and chance results for teams in which neither sender nor receiver were artists.

In a replication of the Moss and Gengerelli study, Moss (1969) divided volunteers into artists and nonartists. Artists were those who worked professionally as painters, composers, actors, and writers. Nonartists included teachers, engineers, secretaries, and housewives. The 30 artist teams scored significantly positively on the psi task while the nonartists scored at chance.
A second direct replication of the Moss and Gengerelli study was reported by Gelade and Harvie (1975). Forty sender-receiver teams were tested. All receivers were artists, as were 15 of the senders. While chance results were reported on the psi task, the artist-artist teams scored nonsignificantly higher than the other groups. Based on the data reported by Gelade and Harvie, Palmer (1978) calculated chi squares for hits versus misses with artists and nonartists. He found significantly more hits by artists than nonartists.

As a follow-up on the Moss work, Moon (1975) made a comparison between artists and nonartists concerning their belief in ESP. Artists were defined as students in the visual arts. Nonartists were students in any other discipline. Artists showed significantly higher belief in ESP than nonartists. In light of the sheep-goat effect (see Palmer, 1978, Schmeidler and McConnell, 1958; Schmeidler, 1988), Moon suggested that belief factors must be considered in future studies designed to assess the ostensible relationship between psi and creativity.

Overall, the creativity and psi database provides support for a relationship between psi functioning and artistic talent. At the least, it suggests that the artistically gifted represent an important population with which to carry out process-oriented work. The present free-response experiment is a further test of the relationship between psi and exceptional human abilities, focusing on a group of subjects renowned for their outstanding artistic talents. Several standardized personality and creativity assessments were used to identify characteristics of artistic populations that may shed light on the psi process.

**Method**

**Subjects**

Participants were 10 male and 10 female undergraduate students from the Juilliard School, a world renowned educational institute for the performing arts. In addition to its reputation as a premier music conservatory, Juilliard has established itself as a major center for dance and drama. In the study there were eight music, 10 drama, and two dance majors. They ranged in age from 17 to 26 years (mean = 21). In four cases, a Juilliard student or relative served as the agent. In the remaining 16 sessions, a laboratory sender was assigned.

Admission to Juilliard is based on exceptional performance abilities and potential in the areas of dance, drama, and music. Students are highly disciplined and many began their performance training at an early age. In the case of music and dance, many of the students interviewed were between 4 and 7 years old when they began training. For many of the drama students, the vocational calling came later, often in high school or college.

Once at Juilliard, the students practice for many hours daily. As noted in the school catalog:
Standards for measuring the progress students make in their fields of study are the standards that apply to professional artists: mastery of technique, power of expression, vitality of interpretation. Juilliard’s tradition of excellence sets these standards high. Nothing less would bring the joy of a shared aesthetic experience to young artists and their audiences alike. *(The Juilliard School Catalog, 1989–1990, p. 17)*

In addition to their specialized performance training and a diverse liberal arts curriculum, many students at Juilliard receive training that emphasizes intuition and spontaneity. Such skills are important for enhancing creativity as an important complement to fine-tuned technical skills. All of these factors make this student population an excellent group in which to explore the relationship between psi and exceptional human performance.

*Experimental Setting and Materials*

The study utilized the automated Ganzfeld paradigm (Honorton, Berger, Varvoglis, Quant, Derr, Schechter & Ferrari, 1990). This procedure was ideal for the study in five ways: (1) It involves a free-response ESP task within the context of an internal state induction technique that gives the volunteer access to unconscious mental processes. This maximizes characteristics identified in the anecdotal reports concerning psi and creativity, including relaxation, dissociation, a demand for new and unusual experiences, and a tolerance for the unrealistic. (2) The Ganzfeld provides an interesting experience for volunteers—a point that is especially relevant to studies of creativity; emotionally stimulating targets provide powerful and interesting stimuli. (3) Based on various reviews and meta-analyses of the database, the Ganzfeld procedure has been shown to facilitate psi performance in a laboratory setting (Child, 1986; Honorton, 1985; Honorton, Berger et al., 1990; Rosenthal, 1986). (4) The computer-based system is designed to reduce human error, eliminating potential procedural problems raised in earlier Ganzfeld studies (Hyman & Honorton, 1986). (5) A large database from the Psychophysical Research Laboratories’ (PRL) autoganzfeld research (Honorton, Berger et al., 1990) allowed a direct comparison between Juilliard students and Ganzfeld subjects not selected for exceptional performance abilities.

*Standardized Assessments*

Prior to the experiment, each participant completed several standardized personality and creativity assessments. They were given Form F of the Myers-Briggs Type Indicator (MBTI) (Briggs & Myers, 1957; Briggs & Myers 1980). The MBTI has been successfully used as a predictor of psi performance (Broughton, Kanthamani & Khilji, 1990; Honorton & Schechter, 1987; Schmidt & Schiltz, 1989). The students also completed a 55-item demographic survey (Personal Information Form, PIF; Psychophysical Research Laboratories, 1983) and
the figural form A of the Torrance Assessment of Creative Thinking (Torrance, 1972). This assessment considers creative thinking abilities as that constellation of generalized mental abilities that is commonly presumed to be brought into play in creative achievements (Torrance, 1990). Such abilities are also referred to as imagination, inventive thinking, divergent thinking, or productive thinking. The three-part inventory is largely pictorial in nature, with a small amount of writing to label drawings. It is designed to evaluate fluency, flexibility, originality, and elaboration. This inventory was administered to students in small groups during breaks from classes at the Juilliard School or at PRL prior to the Ganzfeld experiment. This was done by Schlitz or by Dr. Peter Rojecewicz, a folklorist and Professor of Humanities at the Juilliard School.

Procedures

In preparation for the study, Schlitz attended several classes with the students. She spoke with them informally during breaks, sharing details of her interest in psi research and answering their numerous questions. The students were told that they would be participating in a study to investigate the relationship of ESP and creativity. The experiment was presented as part of a larger study to investigate creativity, self-esteem, and motivation (Schlitz, 1991). This work is now underway at the Juilliard School by Schlitz and Rojecewicz. The Ganzfeld experiment was presented as a novel and exciting experience. Students were told that they would have fun and that they would learn more about their untapped potentials. The students were uniformly positive about this aspect of the introduction, eagerly embracing the option of exploring their abilities.

In order to participate in the Ganzfeld experiment, students traveled by train to the Psychophysical Research Laboratories in Princeton, NJ. They were picked up by one or more of the researchers at the train station. Upon arrival at PRL, the volunteers were given a tour of the laboratory. We attempted to create a friendly, informal social atmosphere. In each case, the volunteer was seated at a table in the conference room and engaged in informal conversation. Snacks, coffee, tea, and soft drinks were offered. Following this get-acquainted period, we explained the rationale and background of the Ganzfeld research and reviewed the experimental protocol.

Because none of the Juilliard students had previously participated in psi experiments, they were scheduled in the ongoing PRL Novice series. Each Juilliard student contributed a single session to PRL Novice series 104 or 105 (See Honorton, Berger et al., 1990). The experimental procedures were identical to those described in detail by Honorton, Berger et al. (1990), with the following exceptions: (1) PRL staff provided transportation to and from the train station; this provided additional opportunity for interaction between subjects and staff. (2) In some cases, creativity assessments were administered to subjects immediately before their Ganzfeld session. (3) Subjects received a check following the experiment covering
Table 1

DISTRIBUTION OF RANKS

| Rank |
|------|------|------|------|------|
| 1    | 2    | 3    | 4    |
| Expected |
| 5     | 5     | 5     | 5     |
| Observed |
| 10    | 6     | 2     | 2     |

transportation costs plus $5.00. (4) For logistical reasons, subjects were not encouraged to bring friends to serve as their senders. (5) Unlike the general PRL subject population, the Juilliard students were not recruited primarily because of an interest in psi; for this reason, we devoted considerably more time toward establishing positive expectations concerning their success in the experiment than was typical in sessions with subjects from the general PRL population.

RESULTS

Overall ESP Performance

Ten of the 20 Juilliard students (50%) correctly identified the target from a judging set consisting of the target and three decoys. This result is significantly above the null hypothesis expectation of 25% (exact binomial $p = .014$, $z = 2.20$). For completeness, the distribution of ranks is shown in Table 1. The effect size, Cohen’s $h$ (Cohen, 1977), is .52 and the 95% confidence interval (CI) is a hit rate from 29% to 71%. This result is higher than the success rate achieved by other novice participants in the PRL population (30.1% hits, $p = .047$, $z = 1.67$, $h = .13$, 95% CI from 24% to 37%). We will examine differences between the Juilliard and the PRL general populations in more detail below.

ESP Performance and Artistic Specialization

The music students produced the highest success rate. Six of the eight musicians successfully identified their targets (75%, $h = 1.05$, $p = .0042$, $z = 2.63$). The 95% CI is a hit rate from 36% to 95%). Four of the 10 drama students also obtained hits (40%, $h = .32$, $p = .224$, $z = 0.76$).

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3 All $p$-values are one-tailed unless otherwise specified. Z-scores associated with exact binomial $p$-values were derived from the $p$-values using the inverse normal function and are provided to facilitate future meta-analytic treatment of the data.

4 These results reflect the performance of all novices except the Juilliard students in Honorton, Berger et al. (1990).
95% CI from 15% to 70%). Neither of the two dance students correctly identified their targets.

Creativity Assessments

We used the standardized ratings of the target and decoys as the dependent variable in examining the relationship between Ganzfeld ESP performance and the creativity assessment (Stanford's z-scores; Stanford & Sargent, 1983). The correlation between Ganzfeld z-scores and creativity is nonsignificant and slightly negative ($r = .12, t = 0.51, 18 \text{ df}, p = .691$). However, the two highest creativity subjects were significant outliers on the combined creativity measure; their creativity scores were two standard deviations above the group mean. (Both of these subjects had negative Ganzfeld z-scores; one had the lowest z-score of all 20 subjects). If these two outliers are eliminated, the correlation with creativity is positive and statistically significant ($r = .41, t = 1.82, 16 \text{ df}, p = .045$). Correlation analysis of the ESP z-scores in relation to the four creativity subscales (Fluency, Flexibility, Originality, and Elaboration), with the two outliers excluded, indicates that Flexibility and Elaboration correlate suggestively with ESP performance. The correlations are .44 ($t = 2.0, 16 \text{ df}, p = .064$, two-tailed) for Flexibility and .43 ($t = 1.89, 16 \text{ df}, p = .078$, two-tailed) for Elaboration.

We also compared the creativity scores with normative data for the Torrance scale. Surprisingly, the Juilliard students scored in the 40th percentile when compared with other college students. This may be due to the fact that the creativity assessment was almost solely visual, whereas the population of music, dance, and drama majors are largely audio or kinesthetically oriented in their preferred mode of communication. Further creativity assessments, including the Torrance scale and others designed to assess an auditory mode of communication, will be administered to determine the reliability of this finding in the context of the Juilliard School. Until this is accomplished, these results must be regarded as tentative though extremely interesting.

Myers-Briggs Type Indicator

None of the MBTI scales are significantly related to ESP performance, though the correlation with the Thinking/Feeling Scale ($r = .38, 18 \text{ df}$) is opposite in direction to that found in three earlier studies with nonartistic populations (Broughton, Kanthamani & Khilji, 1990; Honorton & Schechter, 1987; Schmidt & Schlitz, 1989). While not significant, the correlation between ESP performance and extraversion ($r = .21$) is consistent with that ($r = .20$) estimated in a meta-analysis of the ESP/ extraversion relationship (Honorton, Ferrari, & Bem, 1990): Cohen's $q = 0.01, z = .04, p = .483$.

We found no significant relationships between the creativity scores and
the MBTI. The strongest correlation is between creativity and the MBTI Extraversion/Introversion Scale ($r = .32$, 18 $df$), suggesting a possible relationship between extraversion and creativity among the performing artists. The correlation is significant when the two outliers are removed ($r = .55$, $t = 2.61$, 16 $df$, $p = .019$, two-tailed).

**Comparison of the Juilliard and PRL Populations**

*Demographic (PIF) differences.* The Juilliard students are significantly younger than the PRL population (Juilliard mean = 21.2 years, $sd = 2.86$; PRL mean = 38.6 years, $sd = 11.3$). On a seven-point scale where 1 indicates strong disbelief and 7 indicates strong belief in psi, the Juilliard students’ belief ratings range from 4 (neutral) to 7 (strong belief). Their mean is 5.5 ($sd = 1.05$); this is significantly lower than the PRL population ($t = 3.03$, 221 $df$, $p = .003$, two-tailed). Although 80% of the Juilliard students claim personal psi experiences, they report significantly fewer types of psi experiences than subjects in the PRL population ($t = 2.65$, 224 $df$, $p = .009$, two-tailed). Not surprisingly, the Juilliard students are significantly more competitive than the PRL population ($t = 2.59$, 219 $df$, $p = .01$, two-tailed). All of the Juilliard students, but only 63% of the PRL population, report that they enjoy performing in public (Fisher’s exact $p = .00032$, two-tailed).

*Personality differences.* The Juilliard students do not differ significantly from the PRL population on any of the four MBTI scales. The largest difference is on the Judging/Preception Scale, where the Juilliard students tend to be somewhat more on the Perception side of the JP Scale ($t = 1.49$, 219 $df$, $p = .138$, two-tailed).

*Overall differences in ESP performance.* The Juilliard students’ ESP performance is significantly superior to that of the PRL population. As described above, the direct hits effect size for the Juilliard students ($h = .52$) is substantially higher than that for other Novices in the PRL population ($h = .13$). The mean $z$-score for the Juilliard students is 0.68 ($sd = 1.09$), and the mean $z$-score for all of the subjects in the PRL population is 0.17 ($sd = 1.03$). The difference is significant ($t = 2.09$, 239 $df$, $p = .038$, two-tailed).

*ESP performance in relation to target type.* In the PRL automated Ganzfeld database as a whole, we found that subjects were significantly more successful with Dynamic targets, which consist of short video clips from popular movies, than with Static targets, which consist of nonmoving pictures (Honorton, Berger et al., 1990). The Juilliard students, however, were equally successful with both types of targets. There were six hits in 12 sessions with Dynamic targets and four hits in eight sessions with Static targets. Using the standardized ratings (Honorton, Berger et al. 1990, p. 116), the Static target sessions were independently significant for the Juilliard students (mean $z = 0.77$, $sd = 0.83$, $t = 2.54$, 7 $df$, $p = .02$), but
the dynamic target sessions were not (mean $z = 0.62$, $sd = 1.25$, $t = 1.71$, $11 df$, $p = .058$).

**ESP performance and the sender/receiver relationship.** In the PRL database as a whole, we also obtained better statistical results during sessions in which subjects brought friends to serve as their sender. As mentioned above, this practice was discouraged in the present study for logistic reasons. Nevertheless, four Juilliard subjects did have friends as their sender. Table 2 shows the distribution of hits in relation to sender type. There was only one hit in the four sessions with friends as sender. The 16 sessions with laboratory senders yielded nine hits (56% hits, $h = .64$, $p = .0075$, $z = 2.43$).

**Examples of Target/Mentation Correspondences.** In this section, we present some examples of correspondences between targets and Ganzfeld mentation. In each case we give a description of the target first followed by the participant’s description of the target. While conclusions cannot be drawn from qualitative data, this material should not be ignored. It constitutes the raw data upon which the objective statistical evidence is based, and it may provide important insights concerning the underlying process. These examples are excerpts from sections of subjects’ Ganzfeld mentation reports, identified by them during the blind judging procedure as providing their basis for rating the target. We have edited these sections for purpose of illustration in this paper and not for any evidential value.

**Target 144, Dynamic: Hell.** From the film *Altered States*. This sequence depicts a psychedelic experience. Everything is tinted red. The rapidly shifting scenes include a man screaming; many people in the midst of fire and smoke; a man screaming in an isolation tank; people in agony; a large sun with a corona around it; a mass crucifixion; people jumping off a precipice, in the midst of fire, smoke, and molten lava; spiraling crucifixes. These is a close-up of a lizard’s head, slowly opening its mouth, at the end of the sequence.

**Participant ID: 321. Rank: 1. z-score: 1.49.** ‘I just see a big ‘X.’ A big ‘X’ I see a tunnel in front of me. It’s like a tunnel of smog or a tunnel of smoke. I’m going down it. I’m going down at a pretty fast speed . . . I

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<td><strong>Distribution of Hits by Sender</strong></td>
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still see the color red, red, red, red, red, red, red, red . . . Ah, suddenly
the sun . . . The kind of cartoon sun you see when you can see each pointy
spike around the sphere . . . I stepped on a piece of glass and there’s a bit
of blood coming out of my foot . . . A lizard, with a big, big, big head.’’

**Target 148, Static: Three unusual planes.** Three small aircraft flying in
formation. The planes are white and have swept-back wings; their landing-
gear is extended. A winding road is visible below.

*Participant ID: 322. Rank: 2. z-score: 0.39.* ‘‘A jet plane . . . A 747 on
the way to Greece, blue skies. Sounds like it’s going higher . . . I think
I’m back on the plane again. I never used to be afraid of flying until
recently . . . They need better insulated jets, soundproof like these rooms.
They could use these comfortable seats, too. And the leg room. The
service isn’t bad either . . . Still can’t get the feeling of being in an airplane
out of my mind. Flying over Greenland and Iceland when I went to En-
gland . . . Feels like we’re going higher and higher . . . Descending. It
seems we’re descending . . . Big airplanes flying over with people like me
staring down . . . Flying around in a piece of tin . . . Feel like I’m getting
a G-force. Maybe I am taking off. Sure feels like it. Feels like we’re going
straight up . . . I always feel like this when I’m on the plane going home,
I just hope that plane makes it past the Rocky Mountains.’’

**Target 10, Static: Santa and Coke.** This is a Coca-Cola Christmas ad
from the 1950s, showing Santa Claus holding a Coke bottle in his left
hand; three buttons are visible on Santa’s suit. Behind Santa and to his left
is a large bottle cap with the Coca-Cola logo leaning against an ornamented
Christmas tree.

*Participant ID: 332. Rank: 1. z-score: 1.14.* ‘‘There’s a man with a dark
beard and he’s got a sharp face . . . There’s another man with a beard.
Now there’s green and white and he’s in bushes and he’s sort of colonial.
He looks like Robin Hood and he’s wearing a hat . . . I can see him from
behind. I can see his hat and he has a sack over his shoulder . . . Window
ledge is looking down and there’s a billboard that says ‘Coca-Cola’ on it
. . . There’s a snowman again and it’s got a carrot for a nose and three
black buttons coming down the front . . . There’s a white beard again.
There’s a man with a white beard . . . There’s an old man with a beard.’’

**Target 70, Dynamic: Dancing in NY City streets.** From the film *The
Wiz.* The span of a yellow-paved bridge over a body of water and auto-
mobile traffic is visible in the opening scene; the New York City skyline
is in the background. A hot-air balloon flies overhead. The scene shifts as
Dorothy (Diana Ross), her dog Toto, the Lion, Tin Man, and Scarecrow
dance along the bridge; one of the bridge’s supporting arches is behind
them. The Chrysler Building is in the background. At the end of the sequence, the characters dance in front of a painted backdrop of an old-fashioned building.

**Participant ID: 336. Rank: 1. z-score: 1.40.** "Big colorful hot air balloons... White brick wall... Ocean... People walking before my eyes. Several people... A dog. Hot air balloon... A nightclub singer... Back of a woman's head, short curly hair... Water... Balloon, big balloon... Yellow... Very tall building. Looking down at a city. Leaving a city, going up... Faces. An arc... Water... A woman's face... Cars, freeway... A rock-n-roll star chanting... Architecture. A jester's hat... Geometrical figures, designs... Yellow chocolate bar. Water. Going down into water, deep down... Man with long golden hair and sun glasses... The Bay, San Francisco Bay. A lion... Highways... Lion, see a lion... Tornado... Balloon... Face mask... City... Leaning Tower of Pisa... Long hallway, doorway. Long road. Long, long desert road."

**DISCUSSION**

Building upon previous research (Anderson, 1966; Gelade & Harvie, 1975; Jackson, Franzoi, & Schmeidler, 1977; Moss, 1969; Moss & Gengerelli, 1968), this study provides significant support for the investigation of psi abilities in artistically gifted populations. In the earlier work, no effort was made to evaluate creativity through the use of standardized assessments. Rather, each individual's self-selection as artist was used as the basis of classification. However, as pointed out by Palmer (1978): "Although profession is only an indirect measure of creativity, it may be at least as valid as the direct measures currently available" (p. 139). In the present study, we worked with a population of artists who were both self-selected and carefully screened for exceptional abilities; admission to the Juilliard School is extremely competitive.

The presence of two subjects who are significant outliers on the Torrance scale complicates interpretation of the relationship between ESP performance and creativity in this study. When the outliers are included, we find a nonsignificant negative correlation between ESP Ganzfeld performance and creativity; when they are excluded, the correlation is positive and significant. One possible explanation is that any psi signal may be drowned out in highly creative people by their very powerful uprush of creative ideas. This interpretation posits that the source of creativity is different from that of psi.

Obviously, no conclusion can be drawn from these creativity data, though we are intrigued that of the four Torrance subscales, the strongest correlate of ESP performance appears to be flexibility. Perhaps subjects who exhibit greater cognitive flexibility produce Ganzfeld mentation that is
less anchored in memories and recent sensory experiences than subjects with less cognitive flexibility, whose mentation may be more rigid and stereotyped. We are presently exploring this possibility through a content analysis of the mentation reports.

The ESP Ganzfeld effect size associated with the Juilliard students’ performance is one of the largest reported to date (Horton, 1985, Table A1, p. 84). Given that there is significant evidence for ESP in this study, the question arises as to what other aspects of exceptional human performance, besides creativity, should be explored. We believe that we have learned more in this study from what we observed than from what we measured. The Juilliard students are self-confident, disciplined, and comfortable with new challenges. They have achieved a high level of success early in life and they take on new challenges with the expectation of success. They are highly competitive, but it is our impression that they are competing primarily with themselves, always stretching toward higher levels of achievement. Their reactions at the end of the session were often quite dramatic: when they successfully identified the target, they were exhilarated; when unsuccessful, they were dejected.

The musicians exhibited the strongest ESP performance, and, as a group, they have been involved in their artistic discipline longer than most of the drama and dance students. Most of them have played an instrument from the age of four or five. While the musicians contributed the largest proportion of hits, the drama students produced the most impressive qualitative correspondences; three of the four examples cited above were from drama students. They exhibited a peculiar fascination with their Ganzfeld mentation and frequently reacted in linguistic and metalinguistic ways suggesting that they found their mentation to be extremely entertaining.

These considerations suggest several possibilities. Drama students might have more refined verbal skills than musicians, allowing them to more fully articulate their Ganzfeld mentation. Another possibility is that drama students may be more generally comfortable engaging in tasks involving self-disclosure; certainly they liked to talk about themselves, whereas the musicians tended to be more reserved. Musicians on the other hand, may be better judges because they are more methodical and attentive to details than drama students. They struck us as being generally more task-oriented than the drama students and often took more time to complete the judging procedure. (It should be noted, however, that as a group the Juilliard students generally took longer to complete the judging procedure that did participants from the general PRL population.)

Resolution of these issues must await the outcome of more extensive research, and it would be premature to make too much of the difference in performance between musicians and drama students in this small sample. However, based upon the outcome of this study, we would be inclined to select musicians for future studies relying upon subject judging, and we would choose drama students for studies using outside judges.
Margaret Anderson (1962), a bellwether in experimental research on psi
and creativity, stated the challenges posed by this area very well in her
presidential address to the Parapsychological Association:

Whether the understanding of one unknown, as ESP is, will or will not be
achieved by working on it with another unknown, such as creativity, will be
settled by experimentation, not discussion. Regardless of the road we choose
to travel, we all share the road blocks of the seemingly infinite number of
variables complicating and frustrating our path. Their removal is, of course,
our challenge. (p. 291)

Indeed, a progressive and systematic research program is needed to
address the myriad questions before us. Are there specific characteristics of
artistically gifted populations that will clarify the relationship between psi
and creativity? Do aspects of their formal training and life experiences
explain why artists appear well suited for psi research? Do unconscious
mental processing and imagery induction techniques play a significant role
in the psi experiences of creative populations? Such questions, addressed
under well-controlled experimental conditions, promise to shed much
needed light on the replication problem in parapsychology. In the process,
we may gain important insights into the nature of exceptional human
abilities. These too are our challenges.

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