

REMARKABLE CORRESPONDENCES BETWEEN GANZFELD MENTATION AND TARGET CONTENT – A PSYCHICAL OR PSYCHOLOGICAL EFFECT?¹

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ABSTRACT

Remarkable correspondences between Ganzfeld mentation and target content have been reported since the start of Ganzfeld experiments in parapsychology. These correspondences may either be due to some form of anomalous information transfer (e.g. telepathy) or to a cognitive illusion on the part of the perceiver. The present paper presents four studies conducted in order to investigate which of these two possibilities is the more probable one. In Study 1, an external judge in a Ganzfeld experiment selected the 20 short segments that showed most remarkable correspondences between Ganzfeld mentation and film clip content while being blind to whether the chosen film clip had been used as a target or as a decoy. In Study 1, an external judge in a Ganzfeld experiment selected the 20 short segments that showed most remarkable correspondences between Ganzfeld mentation and film clip content while being blind to whether the chosen film clip had been used as a target or as a decoy.. Only 6 of the segments showed correspondences between the mentation and the target, which is close to chance expectation level. In study 2, eleven students rated the 6 correspondences that were “hits” as being as equally impressive as the 14 that were “misses”. In studies 3 and 4 the possibility that the 14 correspondences that were “misses” could have been due to a form of “displacement clairvoyance”, was shown to be very unlikely. It was concluded that the impression that the receiver can sometimes almost “see” the target is probably a cognitive illusion.

INTRODUCTION

Since the very start of Ganzfeld experiments in parapsychology, there have been reports of remarkable correspondences between Ganzfeld mentation and target content. As an example, consider the receiver's mentation that was reported by Honorton et al. (1990):

“...Now visual patterns more like a spider web and the color. And then like the form of the veins of a windmill... Something like a spider web again. A spider web. A pattern that instead of a spider web it looks like basket weaving...” (p. 125)

The target for this receiver was a film about a spider weaving its web. It was reported that the receiver said the word “spider” 46 times during the mentation (Rick Berger, personal communication, August 1997). Many parapsychologists have apparently been very impressed by such correspondences. For example, John Palmer (2003) writes:

“Because a ganzfeld session comprises only one trial, success cannot be demonstrated statistically for a single session, although sometimes the correspondence of the mentation to the target is so close in detail that success is obvious.” (p 54)

¹ Study 1 and 2 presented here has also been presented at the 47th Annual Convention of the Parapsychological Association (Westerlund, Parker, Dalkvist & Goulding, 2004). We would like to acknowledge the financial support of John Björkhem Memorial Foundation and the BIAL Foundation.

Of course, most parapsychologists have also been aware of the difficulties in interpreting correspondences of this kind. However impressive they may appear, it has been impossible to know what the chances are of such correspondences occurring by random processes. So even though some of these correspondences have been published, most of them have been spread by hearsay and by informal presentations at PA conferences. One example is a videotape, compiled by Kathy Dalton, that shows some of the correspondences between receiver mentation and target content that appeared in the Sender – No sender study conducted in Edinburgh in 1994 (Morris, Dalton, Delanoy & Watt, 1995). On this tape, the target video clip is shown at the same time as the mentation of the receiver can be heard. One of the most remarkable excerpts shows a man who is running through a forest; it seems that he is being hunted (at the same time, the receiver says: "Trees. People running. Fleeing."). Suddenly, the man falls down in a deep muddy pool (at the same time, the receiver says: "Falling. Muddy."). The camera zooms in on the man's face (at the same time, the receiver says: "Blond hair. 70's hairstyle. Curly-ish. White face." – all the utterances appear to describe exactly what is being shown on the film). The next thing that happens in the clip is that the man can no longer keep his head above the surface, so he disappears into the mud (at the same time, the receiver says: "Dead man in the water."). Unfortunately, the synchronization between the video clip and the tape with the receiver's mentation was not done automatically. Kathy Dalton (personal communication, August 1997) matched the mentation tape with the video clip according to her memory of the session (in which she was one of the experimenters).

In order to resolve this uncertainty, in a series of Ganzfeld experiments conducted by Parker, Persson and Haller (2000), an additional video tape recorder was installed in the laboratory. The sound from the receiver was automatically recorded on the tape in this recorder together with the film clip that was played from the first video tape recorder to the sender. After using this method for 120 Ganzfeld sessions, Adrian Parker was able to compile a 30-minute long tape filled with strikingly good correspondences between the receiver's mentation and the target clip. One scene, for example, shows a woman running through a forest. At exactly the same moment as the woman falls and hits her face on the ground, the receiver says: "feels like someone is falling, hitting the face on stony ground".

Two of us (JW and JD) were very impressed by these compilations of "Greatest Hits in the Ganzfeld". We soon realized, however, that there was considerable variation in how these correspondences were perceived by different persons. Some individuals (including both persons with a very skeptical attitude and with a very positive attitude towards psi) were not impressed at all, while others (also including both persons with a very skeptical attitude and with a very positive attitude towards psi) concluded that this was as close to a "proof" of psi as you could get. Of course, we also realized that even if everyone would have been extremely impressed by these correspondences, they do not constitute scientific evidence for psi. There are many ways in which this kind of subjective validation could prove invalid, the most obvious being the inability to take into full account all instances in which there were *no* correspondences between the mentation and the target.

So, what is clearly needed is some form of *baseline* on which the correspondences between the receiver mentation and the target content can be compared. Contrary to what many parapsychologists have thought, such a baseline is, in fact, not difficult to establish. The way to do this is simply to select the most impressive correspondences while in the judgment phase of a Ganzfeld experiment. In this phase, the judge (the receiver or an independent judge) compares the mentation to the four possible film clips. What the judge should do, of course, is to note all the striking correspondences between the mentation and the content of any of the four clips. If such correspondences are signs of telepathy, they should (more often than chance) turn out to be matches between the mentation and the target clip and not between the mentation and any of the decoys.

The problem with this method is that in traditional Ganzfeld experiments, the mentation is usually only recorded on an ordinary tape recorder, without any possibility to synchronize it with the target clip during the judgment phase and without any possibility to synchronize it with the decoy clips. Fortunately, with the new Digital Ganzfeld technique, recently developed in Sweden, the mentation is automatically synchronized with both the target and the three decoys during the judgment phase. This technique has been described in detail elsewhere (Goulding, Westerlund, Parker & Wackermann, 2001; Goulding, Westerlund, Parker & Wackermann, 2004; Parker, 2003), but since all studies reported in the present paper are based on data collected during the first formal Digital Ganzfeld

experiment (Goulding, Westerlund, Parker & Wackermann 2004), the most important aspects of the system will be described below.

The Digital Ganzfeld

The Digital Ganzfeld program consists of two software components, one for *running* a Ganzfeld experiment and the other for *judging* a Ganzfeld experiment. When running a Ganzfeld experiment, the software first selects one set of four film clips from a library of 25 sets. All film clips are stored digitally on the computer's hard drive, and all clips are exactly 2 minutes and 3 seconds long (the last three seconds of each clip shows a blank screen). When the receiver is ready to start, the sender starts playing the clip. At exactly the same moment, the computer starts recording the receiver's mentation.

The target clip is played 7 times, with 0 seconds being needed for restarting, and after this the recording of the mentation stops. Thus, a total of 14 minutes and 21 seconds of the receiver's mentation is stored on a file on the computer's hard drive. The experimental phase continues with the computer selecting a second set (but not the same as was recently used) and then presenting one film clip from this set seven times to the sender while recording the mentation into a new file. With this procedure, two sessions are squeezed into one experiment, thus making the data collection more economical than when only one session is run per thirty minutes. It is also reasoned that should the participant enter a prolonged psi-conducive state then the two sessions might capitalize on this by producing a double hit.

The software for judging the experiment is primarily designed to be used by someone who is accustomed to it and has a great deal of time available for the judging (one session usually takes 1-2 hours to judge), but it can also be used by the receiver with some help from an experimenter. A session is judged by first downloading the corresponding mentation file from the university server. The name of the file reveals which set was being used (but of course not which clip was the target). The mentation file is then opened from the judging software, together with the four film clips in the set. The mentation file can now be played together with one or two of the film clips. The receiver's mentation becomes exactly synchronized with the film clips, so any real-time correspondences that occurred during the experimental phase can be easily identified. The idea is that this should help the judge in deciding which of the four film clips was actually the target. There is also a function for "bookmarking" correspondences. The judge can write down what the receiver said together with information about when it was said and save this as a bookmark. Later, by clicking on this bookmark, the judge can again listen to the mentation while watching and hearing the corresponding film clip at the same time.

The first experiment using Digital Ganzfeld

In the first experiment with Digital Ganzfeld (Goulding, Westerlund, Parker & Wackermann, 2004), one of us (AG) was the main experimenter and another one of us (JW) worked as an external judge. The experiment was run in Gothenburg, but the judging was done in Stockholm, some 400 km away. A total of 64 receivers produced 128 mentation files. JW judged all of them, but half of the receivers also made their own judgments. The main analysis was done on the number of direct hits that the external judge produced. This number was almost exactly at chance level (23%). It is worth noting, however, that the receivers themselves only produced 14% direct hits, which is significantly below mean chance expectation ($p = .05$, two-tailed, exact binomial test).

STUDY 1

INTRODUCTION

The purpose of the first study was to compare the number of subjectively remarkable correspondences that could be found between the receiver mentation and the *target* film clip with the number of subjectively remarkable correspondences that could be found between the receiver

mentation and any of the *decoy* clips in the current set. If correspondences of this kind are signs of telepathy, significantly more than one fourth of them should be correspondences between the mentation and the *target*.

One problem, which until now has not been addressed, is how long a correspondence should be allowed to be and still be judged as *one* correspondence (and not, e.g., two or three). In the present study, we decided that a correspondence should be restricted to "a single utterance" or "a single meaningful sequence of utterances". The exact limits of an utterance or of a sequence of utterances were not further defined, but the reader should note there are important differences between an analysis based on such short segments of correspondences and one based on more complete mentation correspondences.

One major problem in judging the "unlikelihood" of obtaining similarities between the whole mentation from a Ganzfeld session and a particular film clip is the dependency issue. Suppose, e.g., that the receiver guesses that the clip the sender is watching is from a western movie. The receiver will probably say things like this: "An American Indian", "A man on a horse", "A saloon", "There is a quarrel", "Guns" and "Shooting". Now, if the guess actually was a correct one, there is a good chance that several, or maybe all, of these utterances will match the clip in some way, because the utterances as well as the events on the clip are not independent of each other. If a film clip shows an Indian, it is also likely to show a man on a horse; and if someone thinks about a film with an Indian, that person is also likely to think about a man on a horse. However, by using small segments of the mentations, this dependency problem is substantially reduced and the task of selecting the most impressive correspondences thus becomes easier. The drawback is, of course, that a great deal of potentially important information is lost. If you only know that the receiver said "spider" at one occasion when the target was a spider, you *should* be less impressed than if you know that the receiver said "spider" 46 times in this situation.


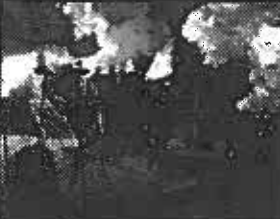



METHOD

While judging the sessions in the first Digital Ganzfeld experiment, the external judge bookmarked what appeared to him to be remarkable correspondences between the mentation and any of the four film clips in the current set. As mentioned above, there were no limitations concerning the length or content of what should constitute one correspondence. It turned out, however, that no single correspondence was longer than 38 seconds (Mean = 17.1 s, SD = 9.2 s). There were also no limits on how many correspondences could be selected, except that only one correspondence was allowed for each mentation file.

RESULTS

A total of 20 correspondences were selected. Unfortunately, two of them came from a receiver who was excluded from the main experiment. This receiver had already participated in a Ganzfeld experiment, and one of the requirements for participation in the main experiment was no previous participation in a Ganzfeld experiment. However, as the hypothesis under investigation in the present study was not dependent on whether the receiver was a Ganzfeld novice or not, it was decided that those two correspondences should be retained. The selected correspondences are described in Table 1 below. The reader is urged to rate the degree of 'impressiveness' of each correspondence before reading about the actual results.

Table 1. Descriptions of the 20 selected correspondences.

No	A frame from the clip	The mentation that was selected and the corresponding film clip
1		<p>Mentation: "A sun, a forest and a meadow. Butterflies. A child, or a woman who is chasing the butterflies. She is wearing a long, light-colored dress. From the turn of the [last] century." (In Swedish: "En sol, en skog och en äng. Fjärilar. Ett barn, eller en kvinna som jagar de här fjärilarna. Hon har lång ljus klänning på sig. Sekelskiftet.")</p> <p>Film clip: Elvira Madigan, suicide pact.</p> <p>Comment: In the film clip library there were three clips from the movie Elvira Madigan. At several times, this receiver appeared to describe the content in all of these clips. However, the descriptions were seldom synchronized, i.e. they were seldom in real-time correspondance with the clip that was a part of the current set</p>
2		<p>Mentation: "Also a feeling of something that explodes, fireworks or..." (In Swedish: "Också en känsla av att något exploderar, fyrverkeri eller...")</p> <p>Film clip: Photographing Fairies</p> <p>Comment: This film clip is about a man who is coughing up fairies. Two assistants are trying to capture the event on film and use up a lot of magnesium powder flashes. The receiver talks several times about someone who is coughing and about explosions and fireworks.</p>
3		<p>Mentation: "Falling." (In Swedish: "Falla.")</p> <p>Film clip: Nature film, a diving eagle</p> <p>Comment: The receiver talks about "blue sky", "parachute jumping", "floating" and "bird". Exactly at the same time as the clip shows the eagle diving, the receiver says: "Falling".</p>
4		<p>Mentation: "This sea animal is coming towards a little girl who is standing at the shore and she is quite petrified this little girl (In Swedish: "Det här sjöodjuret kommer fram emot en liten flicka som står vid sjökanten och hon är ganska så förstelnad den lilla flickan.")</p> <p>Film clip: Night of the Hunter, hunted children</p> <p>Comment: This clip shows a man armed with a knife who is chasing two children, a girl and a boy. The children flee on a rowboat and the man is forced to stop pursuing them in the water, which makes him scream in anger.</p>
5		<p>Mentation: "Shot." (In Swedish: "Skott.")</p> <p>Film clip: Elvira Madigan, suicide pact</p> <p>Comment: This clip shows a woman who is chasing butterflies on a meadow. It ends with the picture being frozen followed by the sound of two shots being heard. And then the sound from two shots can be heard (it is the woman who is being shot). One second after the second shot, the receiver says: "shot".</p>

6



Mentation: "Birds." (In Swedish: "Fåglar.")

Film clip: The Birds, attacking birds

Comment: The receiver says many things that appear to describe the content of the clip. For example: At the same time as the film shows children being attacked by seagulls, the receiver says: "Birds".

7



Mentation: A chimpanzee (In Swedish: "En chimpans")

Film clip: Nature film. Monkeys in a jungle.

Comment: The receiver says many things that fit this film clip. Besides "a chimpanzee", she says "the twitter of birds", exactly at the same time as the twitter of birds can be heard on the clip.

8

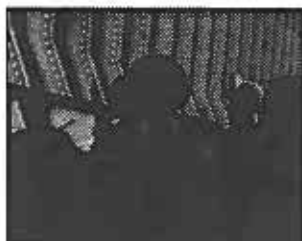


Mentation: "It is strange because I can feel it in my right forearm, in my right elbow. (In Swedish: "Det är märkligt för det känns i höger underarm, i höger armbåge.")

Film clip: Photographing Fairies, a woman falls into a chasm.

Comment: The film clip is about a newly married couple who is taking a walk in the alps. Suddenly the woman falls into a chasm. Her husband succeeds in catching her hand and struggles to hold her. Eventually he loses his grip and she falls down into the chasm.

9



Mentation: "And there is a quarrel starting. I think that maybe weapons are being used." (In Swedish: "Och det bli nåt gräl som uppstår. Jag tror det är vapen inblandat.")

Film clip: Reckless Kelly, a preaching cowboy.

Comment: The receiver says many things that fit well with this clip, e.g.: "Yes, it is clearly the wild west", "It reminds me of the Cartwright brothers²... in those cowboy hats."

10



Mentation: "Where there's still blackness, there are flapping birds and there is mostly fog... and there are birds diving over the ocean, diving and catching something" (In Swedish: "Där det kvarvarande svarta är flaxande fåglar och så är det mest dimma... och det är fåglar som dyker över havet, dyker ner och fångar nånting")

Film clip: The Birds, attacking birds

Comment: The receiver talked about flapping birds also on another occasion, but at that time, no birds were shown on the clip.

11

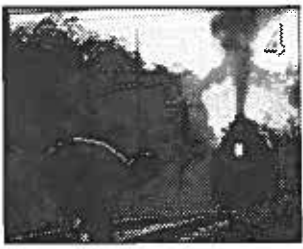









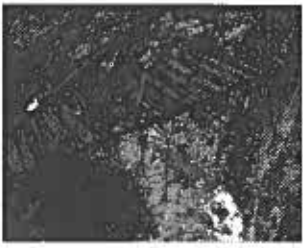
Mentation: "I can feel it in my fingers and in my arms that I am holding something. It is round. (In Swedish: "Jag kan känna det i fingrarna och i armarna att jag håller i nånting. Det är runt.")

Film clip: Barbara, rowing after a ship

Comment: The clip is about a woman who is trying to row to a ship on which her lover is going away. The receiver says several things that appear to fit this clip quite well. For example, the receiver says: "I can feel movements, the chair is rocking."

² From the TV series *Bonanza*.

- 12  **Mentation:** "An old steam engine with its whistle blowing" (In Swedish: "Ett gammalt järnvägslok, som tjuver")
Film clip: Fried Green Tomatoes, a boy gets stuck on the tracks.
Comment: The receiver says this at exactly the same moment as an old steam engine shows up with its whistle blowing and starts to move towards the boy who is stuck.
- 13  **Mentation:** "Looks like something is being lifted up, a tong holding something, a loop." (In Swedish: "Ser ut som om det hissas upp nånting, en tång som håller i nånting, en ögla.")
Film clip: Freaks, the shortest man on earth.
Comment: The receiver says this at exactly the same time as this clip shows how a dwarf with a special tong lifts some things in a kitchen.
- 14  **Mentation:** "Cowboy... No, it is a man sitting on a horse." (In Swedish: "Cowboy... Nej, det är en man som sitter på en häst")
Film clip: Dances With Wolves, a man helps a wounded native American woman.
Comment: The receiver says a lot of thing, besides the statement above, that fit well with this clip. For example: "This is America a hundred years ago.", "Are there Indians too?", "Now he rides away.", and "It's a horseman."
- 15  **Mentation:** "Now I am not in space. Now a seagull comes, flies, big seagull, white, grey wings, yellow beak, flies down." (In Swedish: "Nu är jag inte i rymden, nu kommer en fiskmå, flyger, stor fiskmå, vit, gråa vingar, gul näbb, flyger ner")
Film clip: The Birds, attacking birds
Comment: The receiver also says other things that fit well with this clip, e.g.: "And all the seagulls..."
- 16  **Mentation:** "Big ear, protect your ears - she says." (In Swedish: "Stort öra, skydda dina öron säger hon.")
Film clip: Custer, battlefield with a lot of corpses.
Comment: The clip shows how native American women puncture the ears of a dead soldier with some sharp object. Besides the statement above, the receiver did not say much that appeared to describe the content of this clip.
- 17  **Mentation:** "Now I want to think about blood, blood. But I can't see any blood, I just think about it." (In Swedish: "Nu vill jag tänka på blod, blod. Men jag ser inget blod, jag bara tänker på det.")
Film clip: Jeanne d'Arc, miracle on the battlefield.
Comment: The receiver gives the statement above at the same time as a woman on this clip says "I have seen enough blood." On another occasion the receiver says: "Yes, war, maybe war. War. I can see a German helmet." All soldiers in this clip wear helmets.

- 18  **Mentation:** "Up in the air, the hands are being held out, upwards, as if someone tries to embrace the whole world." (In Swedish: "Uppåtgående, händerna går ut, uppåt, som om nån vill omfamna hela världen ungefär")
Film clip: Color Purple, reunion
Comment: This clip shows how a mother and her daughter reunite after having been separated for several years. They run towards each other while holding their arms up. Finally they meet and embrace each other.
- 19  **Mentation:** "I can see seagulls, I can hear seagulls around me. This kind of mattress on the water, blue. An inflatable mattress. Empty. No one is on it." (In Swedish: "Jag ser måsar, jag hör måsar runt mig. En sån här madrass på vattnet, blå. En uppblåsbar madrass. Tom. Ingen på den.")
Film clip: Jaws, people fleeing from the water.
Comment: A blue inflatable mattress is actually being shown on this clip (and you can hear seagulls), but the receiver talks about the mattress 15 seconds after it appears in the clip.
- 20  **Mentation:** "A feeling of a waterfall, that was a little closer, like looking diagonally upwards, as if there was a bridge or something above." (In Swedish: "En förnimmelse av vattenfall, som var lite närmare, som om blicken ändå var riktad lite snett uppåt som om det gick bro eller nånting ovanför.")
Film clip: Romancing the Stone, escape over a ravine with a suspension bridge.
Comment: Everything in the statement above fits with this clip. There are also several other things the receiver says that fit with this clip, e.g.: "glances down, looks steep" exactly at the same time as the woman in the clip glances down and it looks very steep.

Of the 20 correspondences, 6 were correct correspondences with the target clip (= 30%) and 14 were correspondences with any of the decoy clips. This result is almost exactly at chance level ($p = .383$, one-tailed exact binomial test).

Correspondences no. 6, 7, 8, 13, 16 and 20 were "hits", i.e., the clip that the mentation appeared to describe was actually the target clip, the remaining ones (1, 2, 3, 4, 5, 9, 10, 11, 12, 14, 15, 17, 18 and 19) were "misses", i.e., the clip that the mentation appeared to describe was actually one of the decoy clips in the set.

DISCUSSION

Apparently, the results give no support to the psi-hypothesis. Remarkable correspondences between Ganzfeld mentation and target content, which so often have been reported from other Ganzfeld experiments, were also observed in the experiment under investigation in the present study. However, remarkable correspondences were also observed between Ganzfeld mentation and the content of the decoy clips, and the distribution of the correspondences on target and decoy clips was in fact very close to chance level.

So perhaps the remarkable correspondences between Ganzfeld mentation and target content observed in the present and previous studies are not that remarkable after all. Perhaps they are altogether or mostly the result of subjective validation (a concept used by Marks, 2000, in explaining similar coincidental 'hits' both in experimental work and real life). It is perhaps inevitable that subjectively impressive correspondences between people's fantasies and movie contents will appear when looking for such correspondences in material containing about 30 hours of non-stop talking.

A quick look at the correspondences reported in Table 1 shows that in several cases the receiver has talked about water or about birds (especially seagulls). When judging all the mentations from the Ganzfeld experiment, the judge (JW) noted that water and birds were, in fact, very common themes in the mentations, even though in many cases, there was no water or birds on any of the four clips in the set to be judged.

It could be argued, however, that *some* of the remarkable correspondences obtained in Ganzfeld experiments were due to subjective validation, but that a core of correspondences that cannot be explained away in this way still remains. It could also be argued that the power of the current test was too low, as with 20 correspondences, as many as 9 (= 45%) would have to be 'hits' to reach significance. A possible way to get more precise and reliable measurements, and thus higher power, would be to let a group of people rate the 'impressiveness' of the 20 correspondences described in Table 1. This procedure was used in Study 2.

STUDY 2

In order to obtain greater statistical power, a group of students was requested to rate all 20 correspondences obtained in Study 1. The hypothesis (which was considered unlikely by the experimenter, JW) was that the mean rating of the 6 'hits' would be significantly higher than the mean rating of the 14 'misses'.

METHOD

Participants

Eleven undergraduate psychology students participated in the present study (7 women and 4 men, 27 - 41 years old) as part of course requirements (all the students at the psychology department at Stockholm university are required to participate a fixed number of hours in studies conducted at the department, but they can freely choose which studies to participate in). All the students were taking a course in research methods and statistics, with the experimenter, JW, as the principal teacher. In this course, the students were required to read the discussion between Bem and Honorton (1994) and Hyman (1994), published in *Psychological Bulletin*. They were also required to participate in a seminar at which the tape by Kathy Dalton, described above, was shown and discussed. The advantage of having this population as judges was, of course, that the participants were all somewhat familiar with the Ganzfeld technique and with the concept of "remarkable correspondences between Ganzfeld mentation and film clip content". The disadvantage was that they all had met JW and thus could not be considered 100% blind to which mentation was a 'hit' and which was a 'miss' (even though the particular correspondences under investigation in the present study were not discussed, of course).

Material

Software and apparatus for presenting the 20 selected correspondences. The software used for the judging phase in Digital Ganzfeld was slightly adjusted so that it could present the 20 selected correspondences (see above) and was run on an IBM ThinkPad r40 notebook computer, connected to a Liesegang dv 325 projector with a brightness of 1000 ANSI.

Rating form. The ratings of the 20 correspondences were made on a form on which the participants were to rate each correspondence on a scale from 0 – 100. The instructions on the form were that "0" was to be used to denote a correspondence between the mentation and the content on the clip that was not impressive at all, i.e. a correspondence that would very often turn up by chance alone. "100" was said to denote a correspondence between the mentation and the content on the clip that was extremely impressive, i.e. a correspondence that would very seldom turn up by chance alone. The instructions also urged the participants to try to use the whole range of the scale, such that they rated at least one correspondence using a number close to 0 and at least one correspondence using a number close to 100, even if they thought that all correspondences were "not at all impressive" or that all

correspondences were "extremely impressive". These last instructions were given in order to avoid a restriction of range problem in the statistical analysis.

Procedure

The experiment was conducted in a large classroom five minutes after a lecture that all participants had attended. They were told to read the instructions on the rating form, after which any question would be answered. No questions were asked. The experimenter started the presentation software and left the classroom. A few seconds after the experimenter had left the room, the computer presented the 20 correspondences in a random order (using the Visual Basic 6.0 rnd-function, with the system timer as the seed). The participants had been instructed not to rate the correspondences the first time they were presented, as the purpose of the first presentation was to give the participants a "feeling" of the range of the degree of impressiveness of the correspondences. For each correspondence, the particular film clip was presented on a large screen, synchronized with the sound from the receiver in the Ganzfeld experiment. The exact wording of the receiver was also presented in written form under the film clip window, as it was sometimes difficult to hear the mentation. Between successive presentations there was a 7-second long pause. After all the 20 correspondences had been presented once, the software presented a text for 10 seconds, stating that all correspondences were now to be presented once more, but that this time, they were to *rate* every correspondence. The software then presented the 20 correspondences in a new random order, but now with a 12-second pause between presentations. After all the correspondences had been shown again, the participants left the room and handed the forms to the experimenter. The experiment took 25 minutes to perform.

RESULTS

The 6 correspondences that were 'hits' (correspondences between the mentation and the target clip in the Ganzfeld experiment) received a mean rating of 56.39³ (SD = 8.51) and the 14 correspondences that were 'misses' (correspondences between the mentation and one of the decoy clips in the Ganzfeld experiment) received a mean rating of 50.22 (SD = 20.51). An independent samples t-test with type of correspondence (hit, miss) as independent variable and mean rating of the correspondence as the dependent variable showed, however, that the difference was not significant: $t_{18} = .703$, $p = .491$ (2-tailed). The mean ratings for all 20 correspondences, together with standard deviations and standard errors, are presented in Table 2.

³ Unfortunately, at the PA convention in Vienna (Westerlund, Parker, Dalkvist & Goulding, 2004) the means, standard deviations and t-values that were presented were actually the results from Study 4 (see below). We are grateful to Jesper Jerkert who noticed the error in the Vienna-paper.

Table 2. Means, standard deviations and standard errors for the ratings of the 20 correspondences, sorted by means.

No	Hit/Miss	Mean	Std. Deviation	Std. Error
1	Miss	17.36	15.47	4.67
3	Miss	19.45	27.37	8.25
4	Miss	23.73	17.05	5.14
19	Miss	32.82	21.18	6.38
10	Miss	43.91	26.85	8.10
11	Miss	43.91	23.77	7.17
6	Hit	44.18	35.18	10.61
17	Miss	47.73	35.95	10.84
16	Hit	48.36	25.23	7.61
13	Hit	56.82	28.92	8.72
8	Hit	60.82	25.60	7.72
20	Hit	61.82	29.26	8.82
9	Miss	62.45	24.64	7.43
18	Miss	62.91	26.63	8.03
2	Miss	63.82	30.97	9.34
15	Miss	65.00	25.40	7.66
7	Hit	66.36	25.80	7.78
5	Miss	69.27	28.63	8.63
14	Miss	73.00	23.83	7.19
12	Miss	77.73	24.12	7.27

DISCUSSION

The correspondences that were 'hits' were not rated as significantly more impressive than the correspondences that were 'misses'. The result is thus consistent with the notion that the remarkable correspondences so often reported to occur in Ganzfeld experiments are due to subjective validation.⁴ The result should be interpreted with some caution, however, as the participants cannot be said to have been 100% blind, as they were all students of the experimenter.

So far, we have presented two studies, both of which have to be cross-validated in order to be conclusive. The first study showed that when a single judge blindly selected impressive correspondences between receiver mentation and film content, these correspondences were distributed between target and decoy clips almost exactly as would be expected by chance. The second study showed that a group of students did not rate the correspondences between mentation and target clips as significantly more impressive than the correspondences between mentation and decoy clips. Thus, the impression that the receiver can sometimes almost "see" the target, and therefore is able to describe it in great detail, appears to be due to a cognitive illusion after all.

The cognitive illusion theory does not provide the only possible conclusion, however. It could be argued that most or all of the 20 selected correspondences in Study 1 were due to psi. Following this explanation, the correspondences between mentations and decoy clips could be viewed as being due to

⁴ AP has a different opinion which is as follows: Because these results are from a non-significant ganzfeld experiment, then we cannot as yet draw conclusions concerning the non-validity of qualitative studies which are based on the whole mentation report of statistically significant studies. This remains a questions for further empirical study.

clairvoyance, or, for those receivers who later watched all four clips in the used set, as being due to precognition. The same could be said for the correspondences between mentations and target clips, but now with telepathy as a possible additional explanation.

Although this kind of argument might seem to be unfalsifiable, this is actually not true. It would be possible to take half of the 128 mentation files created in the Digital Ganzfeld study and scramble them so that they became associated with different sets than the original ones. A new judge could then be given the task of listening to all mentations, scrambled and unscrambled, watching the clips in the associated sets, and trying to select the 20 most impressive correspondences. If significantly more of these correspondences belong to unscrambled mentations than to scrambled ones, the "clairvoyance hypothesis" would gain support. If not, it would lose credibility. To see what actually would happen, a further study, Study 3, was conducted.

STUDY 3

The purpose of Study 3 was to test the possibility that the remarkable correspondences in study 1 were due to clairvoyance or precognition.

METHOD

Half of the 128 mentation files used in Study 1 were associated with sets other than the original ones. Two judges were then given 64 mentation files each. The first judge, Gergö Hadlaczky, carried out the judging as part of an undergraduate course at the Department of Psychology at Stockholm University, in which the students were required to conduct a study and write a scientific paper about it ("C-uppsats"). The second judge, Johan Rosenblad, did the judging for a small fee. For both judges, 32 of the mentation files were associated with sets other than the original ones and 32 were associated with the original sets. The choices of which mentation files would be associated with the original sets and which would be associated with other sets (and which they would be), were done automatically by means of a Visual Basic 6.0 program (written by JW) using the rnd-function, with the system timer as the seed. This procedure guaranteed that the principal investigator, JW, was not aware of which files had been scrambled and which had not. Both judges were given the task of selecting the ten most impressive correspondences, so that a total of 20 remarkable correspondences was obtained. They used the same software for judging the sessions as the original external judge (JW) had used. As in Study 1, there were no limitations concerning the length or content of what should constitute one single correspondence, but the judges had to restrict the number of correspondences to 10 each. Both judges were aware of the negative results from Study 1, but they had not been told anything about the specific correspondences that had been selected.

RESULTS

A total of 11 of the selected correspondences came from mentation files associated with the original sets (7 selected by GH and 4 selected by JR) and 9 came from mentation files associated with other sets than the original ones (3 selected by GH and 6 selected by JR). This result is almost exactly at chance level ($p = .824$, two-tailed, exact binomial test). Examples of some of the most impressive correspondences are described in table 3 below.

Table 3. Descriptions of some of the selected correspondences in Study 3.

No	A frame from the clip	The mentation that was selected and the corresponding film clip
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1



Mentation: "An eye." (In Swedish: "Ett öga")

Film clip: *Jeanne d'Arc*.

Comment: Precisely after the receiver makes this comment, the camera zooms in extremely closely on one eye and stays that way for a number of seconds.

2



Mentation: "I see a large bird that first looked like a large black, as large as a gull but black; but then when it turned and flew back, I wonder if it was not a predator bird." (In Swedish: "Jag ser en stor fågel som först såg ut som en svart stor, lika stor som en mås men svart, men sen när den vände och flög tillbaka så undrar jag om det inte är en rovfågel.")

Film clip: Swedish film about two witches ("Glasblåsarns barn")

Comment: The sequence shows a black falcon or crow. It is far away at first, standing still, waiting to attack. Then it starts flying closer to the camera, revealing itself.

3



Mentation: "Someone gives me an apple, it is multi-colored." (In Swedish: "Någon ger mig ett äpple, med många färger")

Film clip: The wizard of oz

Comment: The mentation from the receiver (above) comes at exactly the same moment as a girl in the film clip takes an apple from a tree.

All correspondences in table 3 are taken from mentation files that had been associated with sets other than the original ones. Our immediate subjective impression was that the nine correspondences that were selected from mentation files associated with sets other than the original ones were equally remarkable as the eleven correspondences selected from mentation files associated with the original sets. To see if completely blind judges would also get this impression, we decided to let students rate all correspondences in the same way as we did in Study 2.

STUDY 4

In order to get a more precise measure of how remarkable people would judge the two different types of correspondences, a group of students rated all 20 correspondences obtained in Study 3. They also rated all 20 correspondences obtained in Study 1 since the students who did this in Study 2 were not perfectly blind. The two hypothesis to be tested were:

1. For the correspondences obtained in Study 1, the mean rating of the 6 'hits' would be significantly higher than the mean rating of the 14 'misses', and
2. For the correspondences obtained in Study 3, the mean rating of the 11 correspondences selected from mentation files associated with the original sets would be significantly higher than the mean rating of the 9 correspondences selected from mentation files associated with sets other than the original ones.

The correspondences obtained in Study 1 were not compared with those obtained in Study 3, since the correspondences in the two studies were selected by different judges.

METHOD

Participants

Twenty-five undergraduate psychology students at Stockholm university participated in the present study (16 women and 9 men, 19 - 45 years old) as part of course requirements. None of the students had participated in the research methods and statistics course in which the above-mentioned tape by Kathy Dalton had been shown and discussed. Most of the students had, in fact, never met the experimenter, JW, before.

Material

The same software, apparatus and rating form as was used in Study 2 was also used in this Study. The only difference was that the number of correspondences that now was presented and rated was 40 instead of 20.

Procedure

The experiment was conducted in a large classroom on two occasions (with 13 participants the first day and 12 the second). When all participants had arrived, the experimenter described the ganzfeld technique and explained that there sometimes were remarkable correspondences between the receivers' mentation and the content of the target clip, but that there were also similar correspondences between the mentation and the content of one of the decoy clips. The participants were then told to read the instructions on the rating form, after which any questions would be answered. No questions were asked. The experimenter started the presentation software and left the classroom. A few seconds after the experimenter had left the room, the computer presented the 40 correspondences in a random order (using the Visual Basic 6.0 rnd-function, with the system timer as seed). The same procedure as in Study 2 was followed, but the double number of correspondences meant that it now took about 50 minutes (instead of 25) to perform.

RESULTS

Hypothesis 1

The mean rating of the 6 'hits' obtained in Study 1 was 62.78 (SD = 7.82) which was slightly higher than the mean rating of the 14 correspondences that were 'misses', which was 58.85 (SD = 18.94). An independent samples t-test with type of correspondence (hit, miss) as independent variable and mean rating of the correspondence as the dependent variable showed, however, that the difference was not significant: $t_{18} = .485$, $p = .634$ (2-tailed).

Hypothesis 2

The mean rating of the 11 correspondences obtained in Study 3 that were selected from mentation files associated with the original sets, was 55.88 (SD = 12.17). This value was actually smaller than the mean rating of the 9 correspondences selected from mentation files associated with sets other than the original ones, which was 60.64 (SD = 12.17). An independent samples t-test with type of correspondence (from 'unscrambled' or 'scrambled' correspondences) as the independent variable and mean rating of the correspondence as the dependent variable showed the difference not to be significant: $t_{18} = -.871$, $p = .395$ (2-tailed).

DISCUSSION

In the discussion of Study 2, it was warned that the negative result should be interpreted with some caution, since the participants were not 100% blind. Given the present results, it is very unlikely that this lack of perfect blindness in some way would have caused the negative results in Study 2. The students that participated in Study 4 had not heard anything about "remarkable correspondences in Ganzfeld experiments" before, yet there was no significant difference between how impressed they were by the correspondences that were 'hits' and the correspondences that were 'misses'.

In the discussion of Study 2, it was argued that cognitive illusion was not the only possible explanation for the negative results, since it could be that most or all of the 20 selected correspondences were due to clairvoyance or precognition. This possibility now seems very unlikely. Firstly, in study 3, it was shown that of 20 remarkable correspondences selected from an equal amount of 'scrambled' and 'unscrambled' mentations, only 11 came from 'unscrambled' mentations. Secondly, now in Study 4, it was shown that the correspondences selected from 'scrambled' mentations even were rated as (unsignificantly) *more* impressive than the correspondences selected from 'unscrambled' mentations.

GENERAL DISCUSSION

It has been objected that the results presented here are "much ado about nothing" because one assumption behind the present work (and behind the real-time digital autoganzfeld technique) is that the (presumably paranormal) correspondences obtained in ganzfeld experiments are synchronized *in real-time* between the receivers' mentation and the content of the target. This assumption, it has been claimed, is not held by the majority of parapsychology researchers.

It is true that the remarkable correspondences between receiver mentation and target or decoy content that were selected in the studies presented here, were selected to a large degree because of the real-time aspect of the correspondences. Correspondences synchronized in real-time were simply judged as more impressive than correspondences that were not synchronized in real-time. In Study 1 and Study 3, it was shown that remarkable real-time correspondences between receiver mentation and film content were equally likely to turn up for a film that had been used as a target as for a film that had been used as a decoy in the Ganzfeld experiment. The conclusion was that the impression that the receiver can sometimes almost "see" the target, and because of this describe it in great detail appears to be due to a cognitive illusion. To what extent can this conclusion be dependent of the real-time aspect of the selected correspondences?

As a thought experiment one could try to imagine what the results of the studies presented here would have been if the "remarkableness" of a correspondence had not been dependent of the real-time aspect to the same extent as it actually had: For most of the chosen correspondences the event on the film clip that corresponded to the receiver mentation occurred within ± 5 seconds. What would have happened if this time span had been extended to e.g. ± 5 minutes? The answer is, we believe, that many more correspondences would have been chosen. In Study 1 perhaps 200 instead of 20 remarkable correspondences would have been selected. But is there any reason to believe that this would have changed the proportion of target clips that would have been included? We do not think so, because that would suggest that a characteristic of psi is that psi mediated correspondences are *not* in real time, i.e. that it would be *more* probable that a psi mediated correspondence between a statement from a receiver in a Ganzfeld experiment and the content of the target clip occurs if the content of the target clip happens at e.g. "statement + 3 minutes" than at "statement + 0 seconds". To our knowledge, this has never been suggested in the parapsychological literature.

A more serious threat to the validity of the conclusion that remarkable correspondences between ganzfeld mentation and target content is likely to be due to cognitive illusions is the fact that all studies presented here builds on data collected in a ganzfeld experiment in which the main results were at chance level. Maybe remarkable correspondences that can be found in ganzfeld experiments that demonstrate significant psi-hitting are *more* remarkable than the correspondences that can be found in ganzfeld experiments with null-results? This could, of course, be possible. A difficulty in comparing our results with those of successful ganzfeld experiments, is that typically longer sequences of impressive correspondences are presented which sometimes give the impression that the whole film is being monitored by the receiver (Parker, Persson and Haller, 2000). There were also occasions in which the correspondences appeared to reflect a causal effect such as when the receiver seemed to be directly responding to some unexpected event which occurred in the sender. Nevertheless it is the subjective impression of all of us (that the singular best book mark correspondences obtained in Studies 1 and 3 are about equally remarkable as singular best book correspondences from ganzfeld experiments with positive results, e.g. the videotape compiled by Kathy Dalton mentioned in the introduction.

As stated in the introduction, it is important to be aware of the fact that parapsychologists normally (with a few exceptions) don't even mention those kind of remarkable correspondences when reporting from Ganzfeld experiments. It is also important to understand that results from meta-analyses of Ganzfeld experiments (see e.g. Bem & Honorton, 1994; Palmer, 2003), showing significantly more "hits" than would be expected by chance, cannot be "explained away" by the conclusion that remarkable correspondences between receiver mentation and target content in Ganzfeld experiments are of a psychological, rather than parapsychological, nature. Significant results in Ganzfeld experiments could still be due to some kind of anomalous information transfer. If content is proven to be a less significant factor than previously thought, as the results presented suggest, then complex "thought transference" models might eventually give way to more simple models.

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