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Sensing the sending of SMS messages: an automated test

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Abstract.

Objective: To carry out automated experiments to test for telepathy in connection with text messages.

Method: Subjects, aged from 11 to 72, registered online with the names and mobile telephone numbers of 3 senders. A computer selected a sender at random, and asked him to send an SMS message to the subject via the computer. The computer then asked the subject to guess the sender's name, and delivered the message after receiving the guess. A test consisted of 9 trials.

Interactions evaluated: The effects of subjects' sex and age and the effects of delay on guesses.

Main outcome measure: The proportion of correct guesses of the sender's name, compared with the 33.3% mean chance expectation.

Results: In 886 trials there were 336 hits (37.9%), significantly above the 33.3% chance level ($p = .001$). The hit rate in incomplete tests was 38.4% ($p = .03$) showing that optional stopping could not explain the positive results. Most tests were unsupervised, which left open the possibility of cheating, but high-scoring subjects were retested under filmed conditions, where no cheating was detected, with 19 hits in 43 trials (44.2%; $p = 0.09$).

Key words: SMS messages, telepathy, ESP, automated test, internet experiment.

INTRODUCTION

Most people believe they have experienced telepathy or other forms of "extrasensory perception" (ESP) or psi (e.g. Gallup & Newport, 1991; Blackmore, 1997; Sheldrake, 2003). On the other hand, some scientists believe that such claims are erroneous or illusory, or impossible in principle (e.g. Humphrey, 1995). Starting from an assumption of impossibility or extreme improbability, several organizations, such as the Committee for Skeptical Inquiry (formerly the Committee for the Scientific Investigation of Claims of the Paranormal), are dedicated to promoting a very critical attitude to telepathy and other psi phenomena (Carter, 2007). Organizations such as the Society for Psychical Research and the Parapsychological Association also promote a critical, scientific attitude, but in a more open-minded spirit.

A small minority of scientists have been investigating telepathy experimentally for more than 125 years (Radin, 2007). From the 1880s to the 1940s, the most popular experimental method involved card-guessing tests. During this period, 142 published articles described 3.6 million such trials, with positive hit rates that were statistically significant, even though the average effect was small, less than 2% above the level expected by chance (Pratt, et al., 1966).

In the 1960s and 1970s, controlled studies of dreams provided a new approach. Could people pick up images telepathically when dreaming in a laboratory, while a "sender" in another room concentrated on a randomly chosen image? In a meta-analysis of the 25 published studies on dream telepathy, covering a total of 450 trials, the overall hit rate was significantly above chance expectation (Radin, 1997).

Since the 1970s, the principal method used by parapsychologists for investigating telepathy was called the Ganzfeld, and involved a mild form of sensory deprivation. Participants sat in a relaxed state in dim red light with halved ping-pong balls over their eyes. In another room, a "sender" concentrated on a picture or video clip, selected at random from a pool of possible targets. After the session, the participant was shown four pictures or video clips, and asked to pick which one most closely corresponded to impressions he or she may have received during the test session. By chance, participants would select the target picture roughly one time in four, with a hit rate of 25%. In 1985, a meta-analysis covering 28 studies showed a hit rate of 37% (Honorton, 1985). A leading member of CSICOP published a meta-analysis of the same data (Hyman, 1985), and also found that the odds against chance were astronomical.

Hyman and Honorton jointly drew up a set of guidelines for further research (Hyman and Honorton, 1986) in which they recommended rigorous precautions against sensory leakage, full documentation of all experimental procedures, extensive security procedures to prevent fraud, and complete specifications about what statistical tests were to be used.

Investigators in Honorton's laboratory carried out a new series of Ganzfeld experiments following these recommendations; in a meta-analysis of the results from 354 such sessions, the average hit rate was 32% (effect size .28; $p < .01$; Bem and Honorton, 1994). In 1999, a new meta-analysis that included studies from other laboratories claimed there was no significant effect (Milton & Wiseman, 1999). However, Milton and Wiseman's analysis involved questionable statistical methods (Storm & Ertel, 2001) and excluded a recent series of studies from Edinburgh University. When the Edinburgh results were included, overall hit rates were again significantly above chance (Milton, 1999). Also, when Radin (2007) reanalysed the

data in Milton and Wiseman's meta-analysis he found that the overall outcome was in fact statistically significant at the $p < .05$ level. More recent meta-analyses that include new experimental data have also given significantly above-chance hit rates (Bem, Palmer and Broughton, 2001; Storm & Ertel, 2001).

However, the Ganzfeld procedure bears little resemblance to apparent telepathy in everyday life. Most people do not lie in dim red light with halved ping-pong balls over their eyes trying to pick up images from a sender in another room watching a video. Also, in some Ganzfeld tests, the "senders" and "receivers" were strangers, whereas in real life apparent telepathy generally takes place between people who know each other well (Sheldrake, 2003).

In the modern world, the most commonly reported kind of telepathy occurs in connection with telephone calls (Brown & Sheldrake, 2001; Sheldrake, 2000, 2003). Most people claim to have thought of someone for no apparent reason, then that person called; or they knew who was calling when the phone rang before answering it or looking at a caller identification display. Many people claim to have had similar experiences with e-mails (Sheldrake, 2003).

Such impressions of telepathy could be illusory. Perhaps people frequently think about others, and then a person they are thinking about calls. They may imagine that telepathy is involved, but forget all the times they thought about people who did not call. Thus apparent telepathy could arise from a combination of chance coincidence and selective memory. An illusion of telepathy could also arise if a person had an unconscious expectation of a call, based on an implicit knowledge of the caller's behaviour.

Telephone telepathy has recently been investigated experimentally in a series of randomized trials (Sheldrake & Smart, 2003a, 2003b, Sheldrake et al., 2004). Participants received a call from one of four potential callers. The potential callers were nominated in advance by the participants themselves, and were usually people they knew well. Callers and participants were in some cases thousands of kilometres away from each other. In a given trial, the caller was picked at random by the experimenter. When the telephone rang, the participant guessed who was calling before the other person spoke. The guess was either right or wrong. By chance, participants would have been right about one time in four. In a total of 271 videotaped trials, 45% of the guesses were hits (effect size .45; $p < 1 \times 10^{-6}$; Sheldrake & Smart, 2003b). In a replication at the University of Amsterdam the hit rate was also significantly above chance (Lobach & Bierman, 2004).

A related form of apparent telepathy occurs in connection with emails: someone thinks of a person for no apparent reason and soon afterwards receives an email from that person. In an experimental investigation of email telepathy, following a similar procedure to the telephone telepathy tests, participants had four potential emailers. In each trial the sender was selected at random. Before receiving the email from that sender, the participant guessed whom it would be from. In 137 videotaped trials, this hit rate of 47% was significantly above the chance level of 25% ($d = .5$, $p < 1 \times 10^{-6}$; Sheldrake & Smart, 2005).

A similar kind of apparent telepathy happens quite frequently among people who communicate by text (SMS) messages on mobile telephones. In this paper we describe an automated SMS experiment for which participants chose three family members or friends as potential senders. For each trial the sender was selected at random by the computer. All trials were coordinated automatically, and the data were stored in an online database.

In the light of the results from telephone and email telepathy experiments, our hypothesis was that hit rates in the automated text message telepathy test would be above chance, but that the effect size would be smaller than in the telephone and email telepathy tests for two reasons.

First, in experiments on telephone and email telepathy, participants were recruited on the basis of their apparent telepathic sensitivity, whereas in the experiment described in this paper, there was no such selection.

Second, in the telephone and email experiments, participants were asked to guess who was calling or emailing while the other person was actually on the telephone or writing the email. In the text message tests, participants were asked to guess who had sent a text message at least several minutes, and in some cases more than half an hour before they made their guess. Thus the telepathic contact was not simultaneous. We hypothesized that this would reduce the effect.

We did not expect this preliminary experiment to provide conclusive evidence for or against the existence of telepathy. Most of the tests were unsupervised, and carried out in real-life conditions, not in laboratories. Rather, we wanted to explore a radically new procedure that enables tests to occur under "ecological" rather than artificial conditions. This automated method minimized experimenter effects; it enabled people to take part in the experiment while going about their normal lives; and it permitted widespread participation.

However, it left open the possibility that some participants could have cheated. We therefore retested some of the highest-scoring subjects under videotaped conditions to control for this possibility.

METHODS

Procedure

Participants registered online through Rupert Sheldrake's web site (www.sheldrake.org) The subjects entered their first and second names, sex, age, email address and mobile telephone number, and also entered the names of three contacts (first names only) together with their mobile telephone numbers. In cases there two of the contacts had the same first name, in registering they gave them different names, e.g. John and Johnt, when registering and when guessing.

All participants received a welcome SMS message, and the subject was told that she could stop the test at any time by texting STOP to the system. Then the test proceeded as follows:

1. After a random time delay of between 1 and 4 minutes, the system selected one of the contacts at random and sent him a message reading, "This is the telepathy test. Please send an SMS reply which will be forwarded to [subject's name] do not attempt to contact [subject's name] directly. Thank you."

2. The contact then wrote a message to the subject and sent it back to the system, which then immediately sent a text message to the subject reading "[subject's name] one of your contacts has sent you a message. Please reply and guess who has sent it."

3. The subject then sent a text message back to the system with the name she guessed. When this had been received by the system and the data recorded, the message from the contact was sent on to the subject, who therefore received immediate feedback as to whether the guess was correct or not.

4. After a randomized delay this process was repeated until the subject had completed 9 trials, at which stage the test was complete. She then received a message saying "Thank you for taking part in this test. You scored [number of hits] correct out of 9 trials. Please text the word START if you wish to do the test again."

The data were stored on an online database, accessible by the use of a password. When group leaders were recruiting subjects, they asked them all to register with the same group name, and by using this group name as a password, the leader could access the data from all members of his group. The database displayed a chronological list of results, with one line per test, giving the subjects name, the subject's sex and age, the date and time at which the test started, the number of trials and the number of hits. Also, separate columns showed the number of trials and hits and that occurred less than 3 minutes after the contact sent a message to the subject, those that occurred 3 – 10 minutes afterwards, and those that occurred more than 10 minutes afterwards. In addition, for each test it was possible to display all the details trial by trial, and a full list of all messages sent and received by the system during the test, together with the time at which they were sent or received, recorded to the nearest second.

System and Programming

The system was developed and operated by Mobifi Ltd (London, England), an SMS solutions and application provider. Mobifi had an SMS gateway that enabled customers to send and receive SMS messages.

The programming environment was Microsoft Visual Studio (Microsoft Corporation, Redmond, Wash), utilising the Tools for MS SQL Server. The core of the application was written in T-SQL, the language for operations with databases in SQL server. The version used for this application was SQL Server 2000. Microsoft SQL has its own developer utilities which were sufficient for developing this application. The standard Microsoft SQL procedures for generating seed numbers and random numbers were used to select the contacts for each test.

Parts of the application were programmed in VB Script (Visual Basic Script). This script was used to present the results on the web and for communicating with external services such as 2Ergo Plc, the company that provided the direct sending of SMS text messages to Vodafone UK. All the web pages were ASP pages, a version of VB Script.

The application sent SMS text messages using HTTP Post directly from the application to an external gateway provided by 2Ergo, with a direct connection to Vodafone UK which then sent the messages for delivery to the mobile handset.

When the participants replied to the application, they did so by sending a message to a Virtual Mobile Number (VMN), which was provided by the mobile network operator, T-Mobile. These replies were then sent to the application via HTTP.

The application was hosted on a secure server, a Dell PowerEdge 1750, located in a data centre in Byfleet, Surrey, England.

Participants

The SMS system worked reliably only within the United Kingdom, and therefore all participants had to be in the UK or use UK-based mobile telephones. Participants were recruited in two ways. First through RS's website, where anyone who wanted to could take part. Second, by four work scholars, who were taking part under the aegis of the Perrott-Warrick Project, of which RS is Director. These were students who wished to gain some research experience. Each of them was asked to do the test themselves and then recruit 9 other subjects from among their friends and family members. They themselves usually served as a contact in the tests with the participants they recruited, and usually registered the subjects. Subjects were aged between 11 and 72, with the majority aged between 11 and 19.

When all the work scholars' subjects had completed the tests, they retested the two highest-scoring subjects while filming them in their homes, to ensure that the subjects were not receiving any telephone messages, emails, instant messages or other forms of communication during the test. The work scholar set up the camera, and then left the room so that the participants were alone during the test. On completion of the project, work scholars provided RS with a short report and videotapes or DVDs of the filmed experiments. One of the work scholars was able to film only one of the highest scoring participants, so there were 7 filmed tests in all.

Evaluation of videotapes

The videos were assessed blind by Pamela Smart, RS's Research Assistant. Any trials in which the subjects went off camera, received other telephone calls or messages, or in which another person was present in the room, were disqualified.

Statistical Analysis

The results were analysed using the binomial test; the chance probability of a hit was 0.33. Single-sided *p* values were used. The null hypothesis that the hit rate in the tests would not be significantly different from the chance level. For comparisons of different sets of data, e.g. from male and female subjects, the 2 x 2 chi-squared test was used. Cohen's effect size *d* was calculated according to the formula $d = (p \text{ (hits observed)} - .33) / \text{sqrt} (.33 \times .66)$, where *p* (hits observed) is the proportion of hits.

RESULTS

Overall Results

In a total of 886 trials, there were 336 hits (37.9%), significantly more than the 33.3% expected by chance ($p = .001$). Not all subjects completed the 9 trials in a test. Their reasons for breaking off were varied. In some cases one of their contacts did not respond: in others they had to stop the test because they ran out of time; in some there were technical faults with the system that terminated the test too soon.

Altogether, there were 66 complete tests with a total of 594 trials, in which there were 224 hits (37.7%; $p = .009$). Of these tests, 16 had hit rates below the chance level of 3; 22 were at the chance level and 28 were above it.

In the incomplete tests there were 292 trials, with 112 hits (38.4%; p = .03). There was no significant difference (p = .85) between the hit rates in complete and incomplete tests.

Effects of Delayed Guesses

The beginning of each trial took place with a random time delay after the ending of the previous trial; there were also variable delays in the responses of the contacts to the request to send a message, some of which were due to unpredictable delays in the deliveries of text messages by the telephone system, and also variable delays in the responses of the contacts.

After the contact sent his message to the system, the system sent a text message within a few seconds to the subject asking her to guess whom the message was from. There were variable delays before the subject made her guess and sent it back to the system, variable delays in the transmission of the text message to the subject by the telephone system, and variable delays in the subject responding to the text message.

The exact times at which all messages were sent and received were recorded on the database to the nearest second. The delays in responses by the subjects after the contacts sent their messages were grouped into three categories: delays of less than three minutes, three to10 minutes, and more than 10 minutes. In 695 out of 886 trials (78.4%) the time between the contact sending his message and the subject making her guess was less than 3 minutes (Table 1). This hit rate in these trials was 38.7%.

In only 80 trials the delay was between three and 10 minutes, and here the hit rate was 31.3%, slightly below the chance level, although not significantly so. In 107 trials the delays were more than 10 minutes; the hit rate was 39.2%, slightly higher than in trials with less than three minutes delay, but this difference was not significant.

Table 1. Hit rates in trials with different delays between to contact sending a message and the subject responding.

Delay, min	**Trials, No.**	**Hits, No.**	**Hits, %**
<3	695	269	38.7
3-10	80	25	31.3
>10	107	42	39.2

Effects of Subjects' Sex and Age

With male subjects there were 323 trials with 128 hits (39.7%; p = .002); and with female subjects 463 trials with 168 hits (36.2%; p = .07). The higher hit rate with males than females was not statistically significant (p = .29).

The hit rates for subjects of different ages are shown in Table 2. The highest were in the 15-19 and 40-49 age groups; the lowest in the group aged over 60 years.

Table 2. Hit rates with subjects of different ages

Age, y	Trials, No.	Hits, No.	Hits, %
10-14	60	21	35.0
15-19	380	151	39.7
20-29	66	25	37.9
30-39	115	41	35.7
40-49	143	55	38.5
50-59	87	32	36.8
>60	35	11	31.4

Filmed Tests

Seven high-scoring subjects were retested under videotaped conditions to ensure that they were not receiving emails, instant messages, text messages or direct communications from other people during the experimental period. The videotapes were evaluated blind.

Two tests were disqualified because other people entered the room and talked to the subjects. In the other five tests, the videotapes showed no signs of any conventional kinds of communication with other people. In their initial, unfilmed tests, these five subjects took part in a total of 44 trials, with 28 hits (63.6%). In the filmed tests the hit rate was 19 out of 43 trials (44.2%) (p = .08). (In one of the unfilmed trials and two of the filmed trials, the tests terminated after only eight rather than nine trials).

DISCUSSION

Our hypothesis was that hit rates in an automated SMS telepathy test would be above chance levels, but the effect size would be smaller than in previous telephone and email telepathy experiments. We found that the overall hit rate of 37.9% was indeed higher than the chance level of 33.3% (p = .001), and the effect size (d = .1) was indeed smaller than in telephone telepathy tests (d = .45; Sheldrake and Smart, 2003b) and email telepathy tests (d = .5; Sheldrake and Smart, 2005). We expected a lower effect size for two reasons: the subjects in this SMS experiment were not selected on the basis of apparent telepathic ability, and also the subjects guessed who had sent them a message after the message had been sent, whereas the telephone and email experiments were simultaneous: the senders were thinking about the subject while she was making her guess.

We expected that the longer the delay in the response of the subject, the lower the hit rate would be. For delays between three and 10 minutes, hit rates were in fact at the chance level. But for delays of over 10 minutes, the hit rates were slightly higher than in trials with less than three minutes delay. However, this difference was not significant, and it is therefore impossible to interpret. In future studies, it would be

possible to introduce random delays into the system so that a wide range of delayed responses could be studied systematically in order to find out whether seemingly telepathic responses fall off with time after the message is sent.

'Optional stopping' could cause a possible artefact if participants who were not scoring well quit the test. If this were the case, incomplete tests should have a lower hit rate than complete tests. In the present experiment, the hit rate in incomplete tests was slightly higher than in the complete tests, but the difference was not statistically significant. Hence 'optional stopping' cannot explain the positive results reported here. Nor can any kind of 'file-drawer effect' whereby only favourable data are reported. All the data from this experiment are included.

Most of these tests were unsupervised, and therefore the possibility arises that some of the subjects were cheating. We cannot rule out this possibility, but we think it unlikely. First the effect size was small, so if people were cheating, they were not doing so very enthusiastically, or very few were doing so, otherwise the hit rates would have been higher. Second, people had no motive to cheat and most subjects were curious to find out how they would perform in this test. Nevertheless, for a test of this kind to provide strong evidence for the reality of telepathy, the tests would have to be performed under more rigorous conditions. That is why some of the higher-scoring subjects were selected for further tests while being filmed. In these circumstances, the hit rates were still above chance (44.2%) but the sample size was too small for this result to achieve statistical significance. However, the hit rate was lower than in these subjects' preliminary unsupervised tests. Ertel (2005) observed a similar drop in hit rates when he retested previously unsupervised participants under controlled conditions. This exploratory experiment suggests that the best use of unsupervised tests with widespread participation would be to identify talented subjects for more rigorous testing under controlled conditions.

However, unsupervised tests are potentially valuable in their own right for a comparison of variables that effect hit rates. In this experiment, we studied only sex and age, and found no significant differences. In future studies it would be possible to investigate other variables, such as the relationship between the contacts and the subjects and the distance between them at the time of the trial. In previous research on telephone and email telepathy (Sheldrake and Smart, 2003b, 2005) and with internet-based telepathy tests (Sheldrake and Lambert 2007) hit rates were highest when contact and subjects knew each other well, and especially when they were members of the same family. The effects did not fall off with distance, even when the participants were as far away as possible, near the antipodes.

This experiment shows that modern technologies such as mobile telephones and text messages provide good opportunities for 'real world' as opposed to laboratory research.

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