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REPORT

Evidence for Enhanced Congruence Between Dreams and Distant Target Material During Periods of Decreased Geomagnetic Activity

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Abstract — The accuracy of concordance between dream content and target pictures over 20 nonconsecutive nights (1964-1967) for a single percipient was correlated with global geomagnetic activity. Spearman ρ correlations demonstrated a significant association between geomagnetic activity and accuracy (greater accuracy/less geomagnetic activity) for the 24-hour periods that corresponded with the dream nights. These results support the hypothesis that the geomagnetic effect is most evident when anomalous effects obtained under *psi* task conditions is present.

Introduction

Phenomena obtained under psi task conditions can be regarded as anomalous because they appear to preclude the constraints of time, space, and force. Over the past century, considerable research has been conducted in an attempt to understand psi phenomena and to determine whether they are worthy of continued attention and investigation (Edge, Morris, Palmer & Rush, 1986; Rao & Palmer, 1987). The understanding of the mechanism by which psi phenomena occur would facilitate acceptance of these phenomena as legitimate areas of investigation by mainstream science.

Several analyses of spontaneous cases of presumptive telepathy and/or clairvoyance (i.e., *general extrasensory* perception or GESP) have shown that these reported experiences are more likely to occur when the global geomagnetic activity is significantly quieter than the days before or the days after the experience (*e.g.,* Churchill, Persinger, & Thomas, 1994; Persinger, 1987, 1989, 1993; Persinger & Schaut, 1988; Schaut & Persinger, 1985). The effect sizes are equivalent to correlation coefficients of between 0.35 and 0.45.

An independent analysis of the reported spontaneous cases of clairvoyance and telepathy appearing in the *Journal* of the Society for Psychical *Research* and subsequently used by Persinger (1987), detected a weak but persistent statistical relationship between low absolute levels of geomagnetic activity and

the spontaneous cases. A small tendency also was reported for days of poltergeist and haunting onsets to have greater than usual geomagnetic activity (Wilkinson & Gauld, 1993).

Spottiswoode (1991), who evaluated the presence of correlations between trihourly geomagnetic activity and accuracy during remote viewing (anomalous cognition), reported that the significant association between geomagnetic measures and *psi* scores was most evident when psi was operative. Stated alternatively, if there was no evidence of anomalous cognition, the significant negative correlation between the intensity of the geomagnetic activity and the magnitude of anomalous cognition was absent.

The history of science has repeatedly demonstrated that the understanding of a process is most successful when the experimental conditions closely simulate the natural context. Because classic, spontaneous GESP experiences often occur at night and at least one half of these reported experiences are associated with dreams (*e.g.*, Rhine, 1977), it can be conjectured that the pursuit of psi during dream periods should have the highest probability of success. It can also be argued that if some factor (environmental or neurochemical) associated with geomagnetic activity is relevant to psi, then the association should be stronger during nighttime dream periods. Two hypotheses were designed on the bases of these conjectures:

1. Nights on which the strongest experimental GESP occurred would also be nights that displayed the quietest geomagnetic activity compared to the days before and after.
2. Nights that demonstrated weak or questionable GESP would not demonstrate this effect.

Procedure

To test these hypotheses, data were retrieved from the experimental sessions conducted at Maimonides Medical Center in Brooklyn during the 1960s and 1970s (*e.g.*, Krippner & Ullman, 1970; Ullman & Krippner with Vaughan, 1989). A total of 20 separate, nonconsecutive nights (with at least 5 days between any two sessions) were obtained from a single subject, William E., a New York psychoanalyst; these sessions involved 10 different months over 4 successive years (Ullman & Krippner, 1969; Ullman & Krippner, 1970). It was assumed that the utilization of scores from a single subject (especially one like William E. who frequently manifested anomalous results under psi task conditions) should enhance the discrimination of any geomagnetic effect because of the elimination of individual differences — the largest source of variance in these studies. Indeed, William E.'s first night as a laboratory subject was included in our initial investigation of anomalous dreams and geomagnetic activity (Persinger & Krippner, 1989).

The typical procedure followed at Maimonides was for the percipient to arrive at the dream laboratory in time to meet and interact with the agent — a

person who would spend much of the night focusing upon the contents of an art print, randomly selected after the percipient was isolated from the agent and requested to attempt dreaming about the art print. After electrodes were attached to the percipient's head for the monitoring of brain waves, eye movements, and muscle tonus, the percipient parted company with the agent, entering a soundproof sleep room. An experimenter threw dice that in combination with a random number table provided a number that corresponded to a numeral on a sealed envelope that contained a smaller sealed envelope in which there was an art print. The agent was dispatched to a distant room, opened the envelopes, and focused on this target picture during the course of the night.

Two experimenters took turns monitoring the percipient's sleep. Toward the end of each period of rapid eye movement (REM) sleep, the percipient was awakened by an experimenter via intercom and was asked to describe any dream content that could be recalled. The percipient's comments and the experimenter's questions were tape recorded, as was a morning interview in which the percipient gave associations to his or her dream report. The interviews were conducted double blind; neither the percipient nor the experimenters knew the identity of the target or the pool of art prints from which the target had been randomly selected.

To determine the possibility of chance correspondences, the Maimonides team obtained judgments of similarity between the dream content and each of the other potential targets in the pool from three judges who worked blind and independently with materials (*i.e.,* typed transcripts of the dream reports and copies of the target pool never handled by the agent or experimenters) that had been mailed to them. Any extrachance difference between targets and nontargets in their congruence to dream transcripts was considered an apparent anomaly.

For William E., the judges' ranks of the 20 protocols and the numbers of comparison targets were obtained from the records. An accuracy ratio was calculated by dividing the rank (*e.g.,* 1 =greatest compatibility between dream content and target picture) by the number of reference pictures (range 6 to 12). The mean and standard deviation for this ratio were 0.31 (range 0.13 to 1.00) and 0.25 respectively. Because a rank of 1 indicated the greatest concordance between dream content and target, the smaller ratios are inferred to reflect a larger magnitude of psi. From a dichotomous perspective, 10 of the nights were "high hits" with maximum concordance while the remaining 10 were outside of this range.

The daily average aa (antipodal) index (Mayaud, 1973) was selected as the most appropriate measure of planetary geomagnetic activity. The aa index is the oldest continuous geomagnetic index, initiated in 1868. Although the aa values are based upon data from only two stations (one in each of the hemispheres), the daily aa index is highly correlated with better known daily global measures that utilize the magnetic activity from several geomagnetic observatories. Although local variations in the amplitude of geomagnetic activity do

occur, the average daily temporal pattern of the changes in amplitude are relatively similar everywhere, the only exception being those areas subject to transient geomagnetic storms in which the effects of stronger static components emerge.

The aa index was used as the measure of global geomagnetic activity in Persinger's (1987) study of spontaneous case material reported, in Great Britain, between 1868 and 1886 (*e.g.*, Gurney, Myers, & Podmore, 1886). By using this same index, direct comparisons could be made between the experimental data from the Maimonides studies and the spontaneous telepathic experiences a century earlier.

For the collection of 20 sessions, daily average aa values were collected each of the 4 days before and each of the 4 days after each session began. In addition, aa values for successive 3-hour intervals, time adjusted for the discrepancy between UT and Eastern Standard Time (Brooklyn), were also obtained from a computer data base (Boulder, Colorado). Because the accuracy ratio did not necessarily imply equal intervals, and because the data were rank ordered, we selected a non parametric correlation (Spearman ρ) to test our hypotheses. All analysis involved SPSS software.

Results

Spearman ρ correlations between the nightly accuracy scores are shown in Figure 1 (daily aa averages) for daily increments (pluses) and for 3-hour increments (squares). During the 24-hour period that corresponded with the local night (midnight to 6:00 AM), there was a significant positive correlation be-

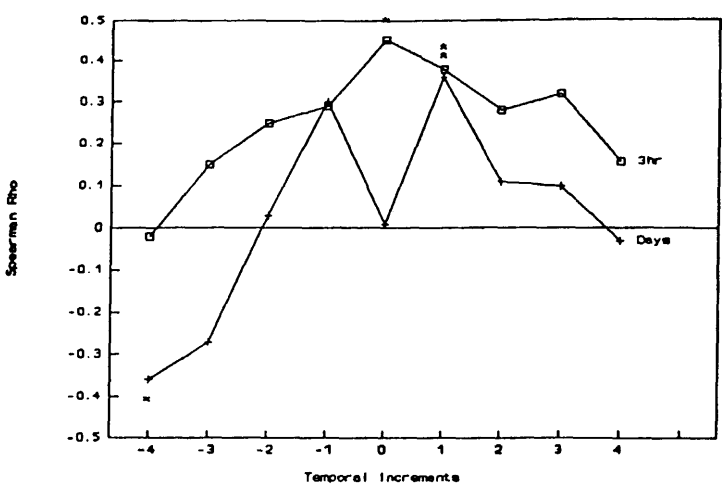

Fig. 1. Spearman ρ correlation coefficients between (absence of) concordance scores between target and content for daily (pluses) and 3-hour (squares) intervals of geomagnetic activity for 20 sessions with William E. [$*p < 0.05$]

tween geomagnetic activity and the score ($p = +0.36, p < 0.05$). Since smaller accuracy ratios indicate a closer correspondence between the dream content and the target, these positive coefficients indicate a negative relationship between geomagnetic activity and psi functioning.

When the 3-hour aa averages (squares) are examined, the maximum correlations occurred during the same time intervals as the analyzed dreams ($p = + 0.45, p < 0.05$) and in the next time intervals of the same mornings ($p = +0.38, p < 0.05$). Again, larger accuracy ratios, implying poorer psi performance, were associated with periods of more intense geomagnetic activity.

The strongest and most significant correlations between the score and the geomagnetic activity occurred with the day of the experiment and the next day. This is not surprising because the actual time of the experiment would involve the following day. Figure 1 indicates that the greatest effect upon accuracy occurred between psi scores and geomagnetic activity between 0600-0859 hours, 0900-1159 hours, and 1200-1459 hours the day the experiment ended. Because Eastern Standard Time is five hours behind UT, this period would be 0100-0359 hours, 0400-0659 hours, and 0700-0959 hours local time. Thus, the concordance was highest during the time when most of the dream reports were collected, that is, during the later part of the night.

Discussion

These findings are in accord with the earlier analysis of the Maimonides experimental GESP sessions as well as analyses of other psi experiments (*e.g.,* Berger & Persinger, 1991), and of spontaneous cases of reported GESP (*e.g.,* Persinger, 1987, 1993). These analyses have shown an association between relatively quieter geomagnetic activity and this class of anomalous cognition.

These results also are commensurate with a study in which Spottiswoode (1991) reported that a geomagnetic effect was only evident when psi was evident within the data base. We also noted an association between the remote viewing scores by one subject who displayed anomalous cognition (data kindly supplied by Ed May) and the concomitant (3-hour increment) geomagnetic activity. There was no association between geomagnetic activity and accuracy when scores (from another subject) did not display anomalous effects.

"Telepathy" and "clairvoyance" have been inferred as a manifestation of psi that involves minimal temporal displacement between the event and the experience. This class of phenomena appears to occur more frequently or with greater intensity during periods of decreased geomagnetic activity. Analysis of experimental studies by Berger and Persinger (1991), dream experiments by Persinger and Krippner (1989), and spontaneous cases (Persinger, 1993) have demonstrated an association between relatively quieter geomagnetic activity and this class of anomalous cognition. The effect size is equivalent to a correlation coefficient between 0.35 and 0.45.

Psi that involved significant temporal displacement between the experience and the event, e.g., "precognition," does not appear to display the same geo-

magnetic effect. In fact, visual (primarily "postmortem") apparitional experiences occur more frequently on days (Persinger, 1988) or months (Randall & Randall, 1988) with enhanced geomagnetic activity. Consequently, over inclusion of cases that involve "precognition" and "postmortem" apparitions with "telepathy" within the same analyses could mask or confuse primary effects.

In his wide-ranging book, ***The Future*** of ***the*** *Body*, Michael Murphy (1992) claims that "we live only part of the life we are given" (p. **3)** and catalogs dozens of anecdotal and research reports to demonstrate his point. Parapsychological data are placed side by side with data from medicine, sports, the martial arts, and the behavioral and social sciences. The examples he gives of voluntary control, self-regulation, transforrnative practice, and extraordinary human experience indicate not only that many human potentials are overlooked by Westerners but that these capacities can provide practical avenues for an acceleration and betterment of human life. The anecdotal and experimental material on anomalous dreams is one of several examples of data that mainstream science ignores at its peril.

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