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Bioelectrographic Correlates of the Direct Vision Phenomenon

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ABSTRACT

Objectives: A method for training children and adults to perceive visual information without using the eyes has been developed. A study was conducted to investigate the correlation of this perceptual capacity, known as direct vision (DV), with bioelectrographic measurements.

Design: Using the technique of dynamic digital gas-discharge visualization (GDV) bioelectrography, seven subjects were tested on three occasions over a 7-month period while they were in the process of reading information from a computer screen and reading printed text; this testing was repeated after an interval of 2 years.

Results: In multiple trials it was found that with the perception of information by DV, curves of GDV versus time exhibited specific dynamics, confirming the phenomenon of DV. At least three types of GDV characteristics can be distinguished in this state. This study also identified improvements in the psychosomatic state of children during the 7-month course of training in DV.

Conclusions: The phenomenon of DV presents a newly recognized type of human information processing. It is based on a specific type of mental training that is statistically reproducible and has been assimilated by hundreds of children in Russia who are blind or have poor vision. The discovery of DV opens new perspectives in the study of the mechanisms of consciousness. The GDV characteristics that were observed during the perception of information by DV support the hypothesis that DV occurs through signals within the visible range of the electromagnetic spectrum. These results allow the proposal of a hypothesis for the way in which the brain, as well as the human system as a whole, registers information.

INTRODUCTION

Research describing the ability to distinguish colors and even to perceive printed information primarily by touching with the hands has been widely publicized in Russia.[1–6] The rarity of this ability has made the investigation of its physiologic and psychologic underpinnings a highly complex process. One of the present authors (V.B.), a psychologist, has developed a technique for teaching the perception of information without the need for optical visual analysis. The original purpose of this technique of mental training, known as the Bronnikov technique, was to help children to improve their self-discipline, power of concentration, and imagination. As this technique evolved, however, it had an unexpected result in the discovery that children could perceive information without using optical visual analysis. When the perception of information without vision yielded repeatable results, the technique for teaching and developing it in children evolved into the field of perception known as direct vision (DV).

Over a 5-year period, more than 100 psychologically healthy children between the ages of 9 and 16 years, at six

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centers in Russia and Ukraine, were trained in DV via the Bronnikov technique. This group consisted largely of children with normal vision, a smaller group of children with visual weakness of varying severity, and six children who were physically blind with a known physiologic defect in vision. During the period of mental training in the technique of DV, no other disorders were found in the health of the trainees. In most cases children mastered the capability for DV after 3–4 months of training and could arbitrarily enter this state and maintain it indefinitely according to the tasks established for testing it. Children in this state were able to perceive information shown on computer or TV screens and in printed text. The children achieved all of this without using optical vision. Six (6) persons were approved as teachers of the DV technique for children, and in this approval process it was observed that adult training in DV is also feasible but is more complicated, more time consuming, and less effective generally than it is in children.

MATERIALS AND METHODS

Dynamic gas discharge visualization technique

The technique of gas-discharge visualization (GDV) bioelectrography allows the recording, from a living subject, of electron and photon emission stimulated by an electromagnetic field, as well as the acquisition of these data by computer image processing.[7,8] The electric impulse on the camera plate stimulates biological subjects (or chemicals evaporated by this subject) and generates a response in the form of an excited gas plasma. This plasma emits both light and other electromagnetic fields over a wide frequency band because of the short electrical impulse used (10 microsec). The emissions are directly measured by a charge-coupled device (CCD), the state of the art in measuring low-level light that is used in astrophysics and other scientific endeavors. The CCD registers the pattern of photons detected over time. These digital data are transmitted directly into a computer for data processing, and each image (named a BEO-gram) from the light emitted is stored as a graphics file. These two-dimensional images of the light are then used to calculate the area, emission intensity, density, fracticality, and other parameters. On the basis of the calculated parameters, experimental conclusions are drawn.

Reportedly the GDV has overcome the experimental obstacles of older forms of electrophotography. What were previously considered as confounding parameters (such as pressure, finger size, sweating, or changes in physical conductivity) in the older forms of electrophotography have been demonstrated by different researchers to be overcome by the new GDV method. Researchers report replicability of findings across different experimenters, different cameras, and different countries.

The GDV technique has been found to be effective in evaluating the state of individual human health,[9] in monitoring of individual reactions to different kinds of training,[10] and in studying the energy properties of liquids.[11–13] Many experimental results are presented in the book "Measuring Energy Fields: State of the Science."[14] The GDV Camera is certified in Russia as a medical instrument.

For recording BEO-grams in the current experiments, the GDV camera manufactured by Kirlionics Technologies International (St. Petersburg, Russia [www.korotkov.org]) was used. This instrument had the following parameters: single impulse duration: 10 microseconds; repetition frequency: 1000 Hz; induction interval: 0.5–32 seconds; electrode voltage: 3–15 kV.

Dynamic BEO-grams were recorded as short films (AVI files) of 15–30 exposures per second during continuous applications of 1–2-second electrical impulses to the fourth finger of the left hand. As serial image files were extracted from these films they were filtered through image-processing software and their parameters (area in pixels and relative intensity) were calculated, yielding a time sequence that could be presented as a time curve. The curves were fitted by geometric application of the tangent of the angle and sign of the inclination of the second-power trend curve P(t):

$$P(t) = k_0 + k_1A(t) + k_2A^2(t),$$

where $A(t)$ = the value of the area at the given time and k_0, k_1, k_2 are approximation coefficients, as well as by the value of relative dispersion D, expressed as:

$$D = \sqrt{Ds}/A_{av},$$

where Ds is the dispersion and A_{av} is the average value of the area for the data in a given time sequence.

Research procedure

Several lines of investigation were tested to study the nature and teaching of DV. Initially seven generally healthy children of both sexes in the age group of 13–15 years who were trained in DV were tested. During the period from April 2001 to June 2001 14 case studies of these seven children, representing testing on two occasions within a 1-month interval. These investigations were conducted according to a protocol coordinated by one of the investigators (L.L.). The test protocol was as described below.

A group of children came to this laboratory together with their parents and the trainer (L.L). The children spent 15 minutes in a friendly, relaxed atmosphere and were then tested randomly on a one-by-one basis. During the measurements a light-proof cloth bandage was placed over each child's eyes.

GDV measurements were recorded for 10 fingers in this initial state. Each child was then asked to create a mental screen, to project different colors onto this screen, and to maintain mentally each projected color for 1–2 seconds.

During this process the dynamic GDV images (BEO-grams) of the fourth finger of the left hand (4L) were recorded.

The next stage of the study involved the presentation of a series of objects projected onto a computer screen for recognition and identification. These objects represented both color and black-and-white images of geometric figures and subjects (e.g., a circle, a square, a bicycle, an airplane, a human being) shown in a total of 40 images. The images appeared in the center of the screen against a white background. The method of presentation involved continued display of the object for the test subject on the computer screen until the object was correctly identified. Subsequently an empty white screen was shown for 15 seconds, followed by the next in a series of objects. The computer randomly selected the objects to be displayed.

FIG. 1. Examples of specific clinical situations during experiments in direct vision, St. Petersburg, 2001.

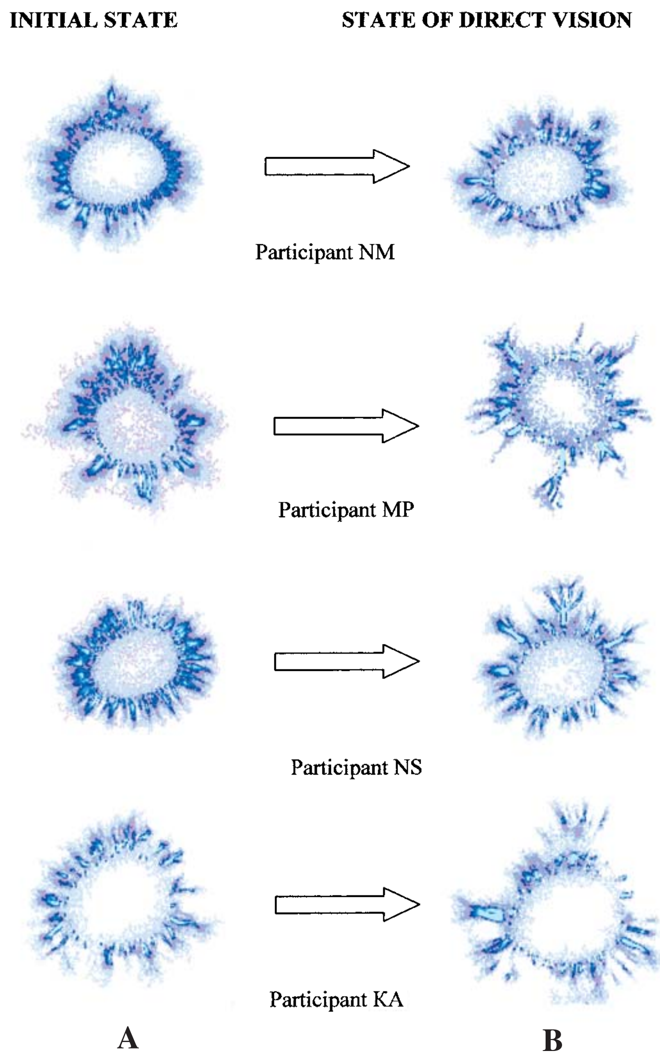


FIG. 2. Modification of patterns of gas-discharge visualization (GDV) energy emission of left ring finger of four subjects under conditions of direct vision. (**A** and **B**). Patterns before and during the state of direct vision, respectively, are shown.

After this initial session, randomly selected pictures and texts were offered for recognition and reading, with the concurrent recording of dynamic BEO-grams. Despite wearing dense, light-proof cloth bandages over their eyes, the subjects showed stable and reproducible image recognition and reading of texts in every case.

In the last of the three study sessions, 10–finger BEO-grams were recorded for each test subject.

Throughout the testing period, physiologic parameters of temperature, pulse, and blood pressure of the test subjects, measured at random as control values, remained within the normal range for the subjects' ages and other characteristics, without showing significant change.

The test protocol included pretest preparation by instruction of the seven subjects and their parents in the tasks, procedures, and concepts of DV. The parents of the children gave their voluntary consent before testing was undertaken. Excerpts of specific clinical situations during the test sessions were photographically recorded (Fig. 1).

A group of generally healthy individuals, ages 22–49 years, who were not trained in DV via the Bronnikov technique were used as the control group in the study. No member of this group was able to perceive the information presented in the test sessions.

RESULTS

Initial state

When the BEO-grams of the study subjects in the initial were analyzed, pretest state diverse results were obtained for both static parameters and the characteristics of dynamic changes. In accordance with the estimation procedure developed by Bundzen et al.,[10] only one participant had a stable initial psychophysical status (A.L.: $D = 0.1$), three had satisfactory psychosocial status (K.A., L.B., N.M.; $D < 10$), and the remaining three had an unstable status (N.S., M.V., M.P.; $18.8 < D < 32$). However all of the study participants had satisfactory status in the second session (Table 1). The slopes of the initial dynamic curves for the different individuals tested spanned the range of 2.8 to ~60.0 pixels/reading (Table 1).

DV state

In the state of DV, the BEO-gram parameters for most of the test subjects had the following characteristics:

1. In the process of transition to the DV state, the transformation of images of the BEO-grams of the fingers were viewed. They became more erratic and uneven, very often with long tails—tracks of electron avalanches or sparks—coming far outside the outer counter of the image (Fig. 2). This type of BEO-gram is typical for altered states of consciousness and mental disorders.[10,12]
2. In a number of cases, distant emission, which is characteristic of conditions of active mental work in an altered state of consciousness, appeared on BEO-grams (Fig. 2), as previously described.[10]
3. As previously mentioned the dynamic curves of the BEO parameters in the initial pretest state for both the test subjects and the control group had relatively small slopes (Figs. 3–5). During conditions for DV the slopes of the curves obtained during individual assessments of the target images rose sharply, reaching >100 pixels/reading (Table 1). Several examples of this are described below.

   Subject K.S. (Fig. 3, area KS). This child was tested in the initial state with eyes covered by a light-impermeable bandage. The dynamic curve of the BEO-gram obtained from the fourth finger of this subject's left hand in the initial state had a monotonically decreasing character, typical of test subjects of stable psychoemotional character in a state of calm wakefulness. She was then given the task of mental visualization of screens that were to be individually colored. "Mental screen" refers to a "mentally conjured" visual field existing entirely within the mind. In this state the curves for the first screen (white) were practically horizontal, as seen from the graphs in Figure 3, whereas on passage to mental visualization of screens of different colors the curves gradually developed positive slopes. In the next task, consisting of reading information from the computer screen (Fig.

TABLE 1. PARAMETERS OF THE DYNAMIC CURVES OF AREA FOR THE BEO-GRAM OBTAINED FROM THE 4L FINGER AT DIFFERENT STAGES OF THE EXPERIMENT

Subject tested	*Inclination angle of dynamic GDV-curve, pixel/reading*				*Dispersion*			
	Initial 1	*Exp. 1*	*Initial 2*	*Exp. 2*	*Initial 1*	*Exp. 1*	*Initial 2*	*Exp. 2*
	Session 1		*Session 1*		*Session 1*			
K.A.	−50	117	11	124	4.5	12.0	3.4	9.0
L.B.	61	79	22	22	9.5	8.6–36.4	3.3	6.2
N.M.	15	122	−5	54	6.5	15.5–42.0	3.7	5.2
N.S.	−60	157	15	31	31.4	7.3–16.0	0.9	5.1
M.P.	−18	78	21	21	18.8	11.5–33.2	1.0	2.5
M.V.	−25	150	−21	42	23.0	12.8	5.0	3.5
A.L.	2.8	125	27	300	0.1	1.1–3.1	0.9	3.1
Control group								
P.P.	4	11	1	−12	2.3	4.5	3.2	6.5
S.A.	1	18	2	5	4.6	3.4	5.3	2.1
V.K.	9	−2	3	−17	12.1	9.2	8.5	11.4

Exp., experiment.

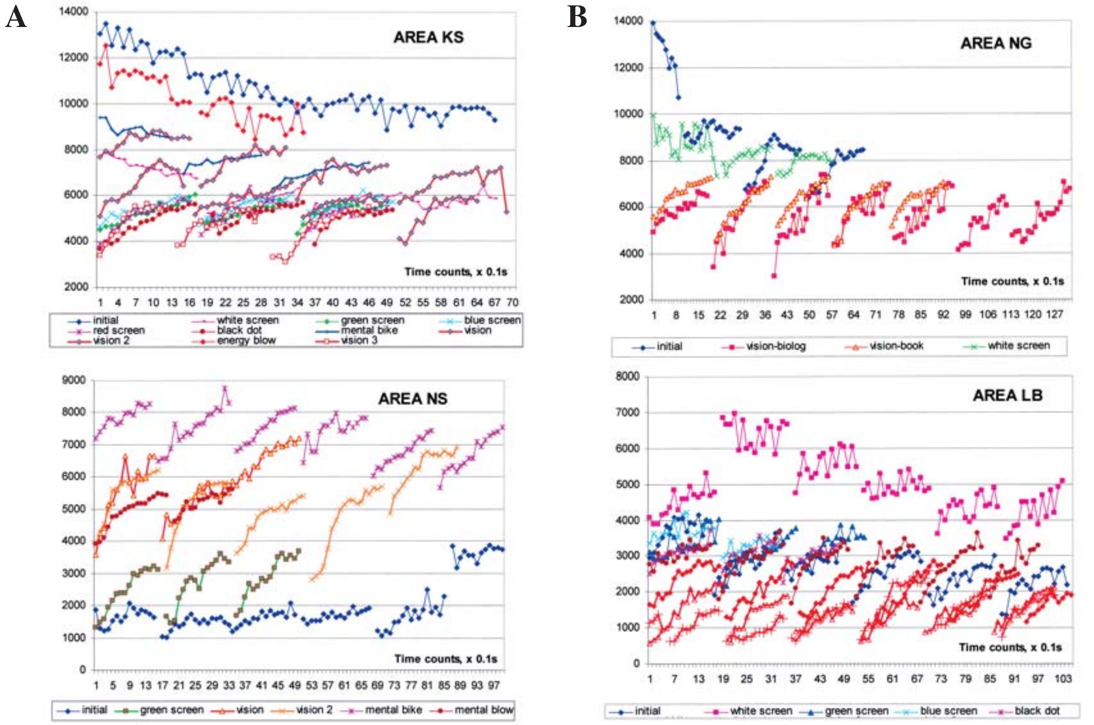


FIG. 3. Dynamic curves of area (in pixels) for the BEO-gram obtained from finger 4L.

3, "vision" and "black dot" curves), the curves developed an ascending character.

Subject N.S. A similar pattern of recorded BEO-gram activity was observed for subject N.S. (Fig. 3, area NS), except that the initial curves for this subject were practically horizontal, and all further exercises yielded dynamic curves with an increasing slopes.

Subject N.G. The initial state of study subject N.G. (Fig. 3, area NG) was characterized by an abruptly descending curve that became horizontal and subsequently increased with saturation. With passage to DV the slopes of the curves increased.

Subject L.B. The initial state for subject L.B. (Fig. 3, area LB) was practically indistinguishable from the state of DV. A possible explanation for this is that this subject passed into an altered state of consciousness at the moment of donning the blindfold bandage. This state was maintained throughout all

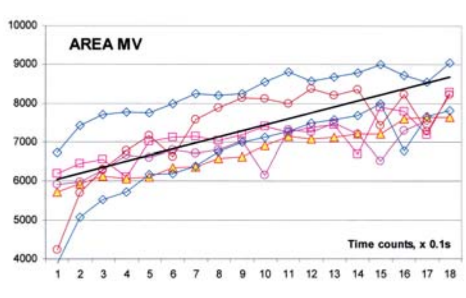


FIG. 4. Dynamic curves of area (in pixels) for the BEO-gram obtained from finger 4L of participant MV in the state of direct vision, reduced to a single initial point. The solid line is a power-trend line.

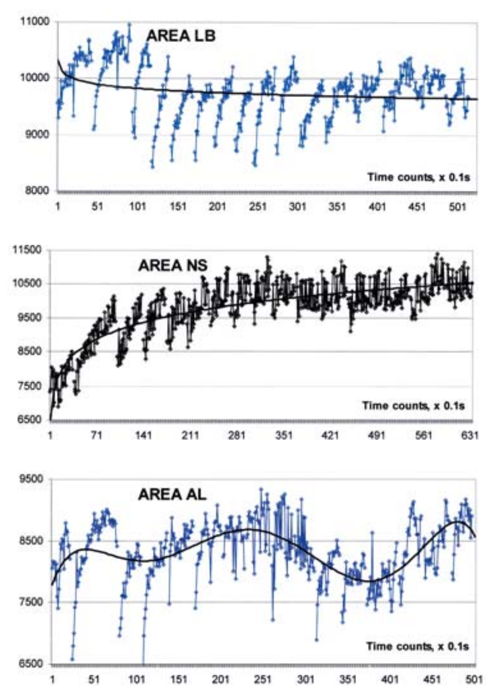


FIG. 5. Three types of dynamic curves of area (in pixels) for the BEO-gram obtained from finger 4L of three participants in the state of direct vision. Solid lines are power-trend lines.

of the study exercises except for the white-screen presentation. In these case examples an increasing slope of curves in the DV state was common to the dynamic BEO-gram curves of all of the test subjects. Differences noted in the dynamic curves during the initial, pretest study state may reflect different modes of consciousness of the subjects as they proceeded into the state of DV.

4. Consecutive recording of dynamic BEO-gram curves were routinely performed for 2 seconds, with a 15- to 180-second interval between recordings. For most of the study subjects intrasession variability in the values of measured parameters was small, with the slopes of the curves being maintained (Fig. 4). After each recording perspiration was removed from the subject's fingers with a dry cloth, which apparently did not influence the subsequent behavior of the curve. Initial and final values for dynamic curves obtained in the DV mode were closely reproduced.
5. Dispersion of parameters generally increased by at least a factor of 2 within each experiment (Table 1).
6. Analysis of time dynamics during the long-run experiment, when subjects performed a series of tests, revealed the following three main types of time dynamics: (a) the power trend line had a slightly negative inclination angle throughout the experiment (Fig. 5, area LB), (b) more commonly, the power trend line had a hyperbolic character, and the curves showed saturation (Fig. 5, area NS); and (c) the power trend line had a wavelike character throughout the experiment (Fig. 5, area AL). These three types of dynamics during information processing under DV conditions were initially inferred; however further data collection to substantiate these early findings led to classification of these three types of responses as fundamental responses.
7. In the DV state a sharp decrease of complex parameter JS[8,14] presented as graphs' contraction were typically registered (Fig. 6). After the end of the experimental session, this parameter was restored usually after an hour.

Comparison of BEO-gram data of test subjects to previous measurements

Table 1 compares the findings for a set of BEO-gram parameters in three study sessions in April and May 2001. As shown the dispersion of BEO-gram parameters in both the initial and DV state decreased in successive sessions for all seven subjects tested. This can be attributed to the calmer attitude of the test subjects toward the test measurements as the result of familiar conditions and a friendly atmosphere, and to the effect of DV training over a 3-month period.

Results of control GDV measurements

The control group consisted of individuals without prior practice or experience in the technique of DV. Care was taken to ensure that all methods of measurement and execution of the experimental protocol were followed with this group, with and without light-proof bandaging of the eyes. A difference was found in the dynamic BEO-gram curves of the study group in the initial state as opposed to the process of recognizing images; however the difference in slope of the two sets of curves did not exceed 15–20 pixels/reading. The results for the control group supported the hypothesis that the dynamic BEO-gram reflected the state of physical activation in the process of solving the assigned tasks. No significant variations were noted in measured parameters as opposed to the features described above for the test group in the state of DV.

For the control group the slope of dynamic GDV curves in the state of calm wakefulness was nearly flat, and the relative variance was 1.0%–1.5%.

Data from other controlled studies

Further research into DV by the current researchers and others has yielded additional findings. Some of the more salient features of these findings are as follows:

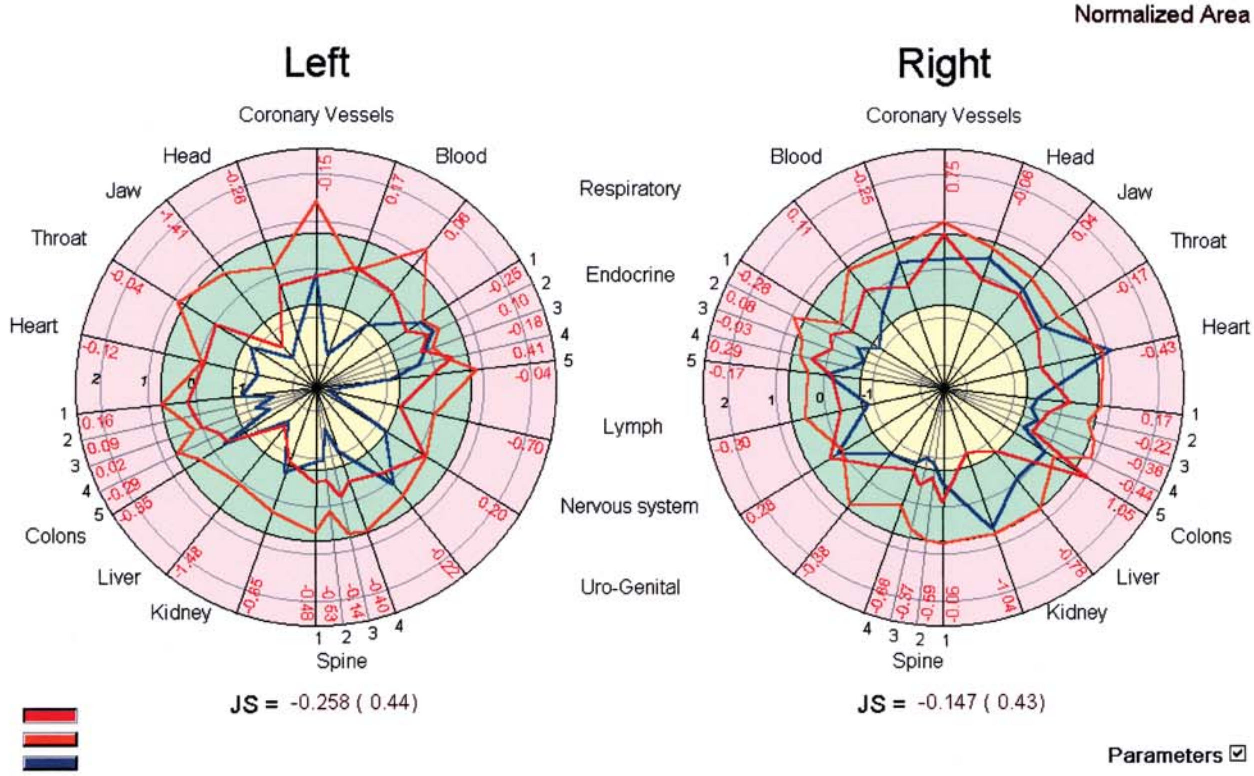
1. When offered text that was positioned upside down, children in the test group could nonetheless reverse and read the images, and their own descriptions suggested that they were mentally capable of reversing the images to be analyzed.
2. Three (3) children in the test group were unable to recognize presented objects or to read text in the experiment conducted in a dark room.
3. Most of the children studied could not read the text if the page was blocked from vision with a nontransparent screen.
4. Experimental sessions with the test group of children, performed at the State Institute of the Human Brain under strictly controlled conditions, confirmed the ability to reproduce correctly the study phenomena.[15]

DISCUSSION

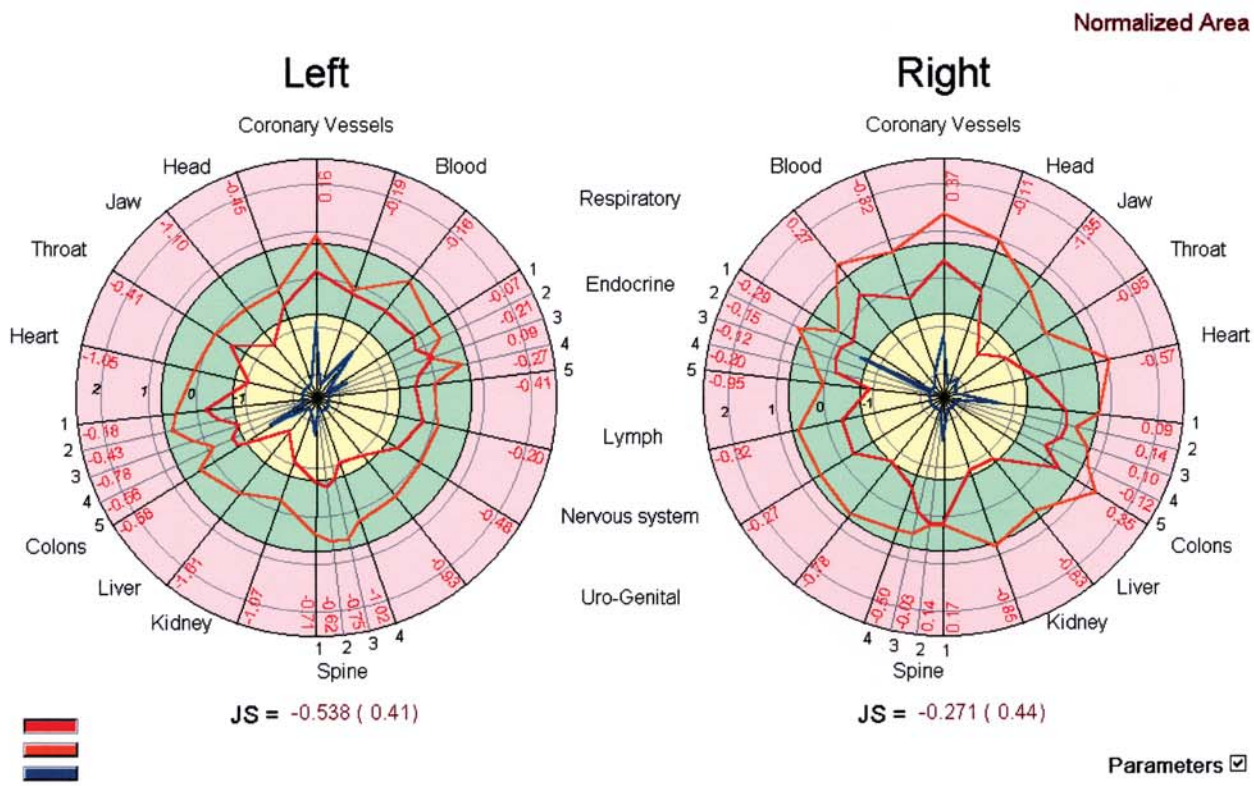
The characteristics of both static and dynamic BEO-grams of test subjects in the state of DV indicate the formation of a specific state of these subjects' energy fields, which can be expressed as the time derivative of the area of the BEO-gram at an imaging rate exceeding 50 pixels/second.

A series of study participants tested in the state of DV had BEO-gram patterns that reflected transition into an altered state of consciousness, as previously found in research on mental training practices such as meditation, yoga, and *qigong*.[7,10] Whether this particular transition is a prerequisite for entry into the state of DV or is simply a byproduct of such activity is not yet established.

In the study the characteristics recorded during the perception of information in the state of DV support the hypothesis that the study participants perceived a signal within the range of frequencies of the visible electromagnetic spectrum.



Participant NG



Participant LB

FIG. 6. Distribution of BEO-gram parameter JS, calculated according to 10-finger assessment in the initial state (outer line) and in different modes of direct vision (inner lines) for two participants.

The study showed a positive influence of the Bronnikov technique on the test subjects' ability to benefit from the training process. This was seen as a dynamic change in parameters during the transition from the state of calm wakefulness to DV, and as improvements in BEO-gram parameters in investigations performed 7 months later, in October 2001.

This pilot study, although internally consistent, must be considered as preliminary in view of the small numbers of subjects studied and the short, 1-month period of observation. Nonetheless individual variations in BEO-gram changes as a function of the subject's initial states, and in the characteristics of the state transformations during information processing are seen during transition into the state of DV. Further validation of these findings will require studies designed to analyze groups of children with a range of initial states and ages, and of both sexes, over longer periods. The present researchers are currently conducting such studies in conjunction with electroencephalographic and tomographic investigations.

The current findings, and those of others as described above, imply the existence of a specific bioenergy state that includes the process of perceiving information through DV; however further research is needed to determine the psychophysical mechanisms involved in mastering the capacity for DV. Some hypothetical mechanisms include:

1. Development of a bioenergy state that is accompanied by specific, trainable aspects of subsensory perception of information, which together periodically undergo short-term transition into an altered state of consciousness that includes the generation of scanning fields in the sensory realm. This mechanism might be defined as the *substrate–field mechanism*.
2. Formation during training of a specialized state in which the sensory system of the trainee becomes linked to the surrounding environment, with the capacity for direct perception of information across a wide range of the visible electromagnetic spectrum. This mechanism might be termed the *eidos-mechanism*, by analogy with the *eidos* concept of Plato, which refers to a transcendental idea the form of which is imperfectly imitated by its earthly representation, as with the shadows on the wall of the cave in Plato's *Republic*.

The research described here has shown that after specialized training, some tested individuals mastered a capability to perceive information placed behind a nontransparent screen; however this ability requires additional investigation which was not covered by the design of the present study.

CONCLUSIONS

The present study and other research described here are the first steps in a more comprehensive exploration of altered states of consciousness through the detection of mechanisms by which DV can be achieved. The experience gained so far shows that the Bronnikov technique accurately uses an innate capability of children for DV and exerts a positive influence on their psychosomatic states. It is important to note that this technique is independent of the tutor who uses it, as dozens of children at various centers have been successfully trained in DV.

The method of GDV as used in this research is a valuable tool for revealing the moment of transition into the state of DV.

The Bronnikov technique creates new opportunities for millions of blind children and those with weak vision. "World Without Blind" is an international program that introduces and trains interested individuals in the Bronnikov technique.

Clearly a thorough understanding of both the physical and physiologic mechanisms of DV will require several lines of research, including the testing of larger populations. The present findings imply that future research should first map the bioelectrography of the brain so as to correlate better these findings with known electrophysiologic variables. The mechanisms of energy transfer in living systems[16] may be implied for the understanding of the DV phenomenon. The ongoing scientific observation, assessment, and characterization of novel interactions of human beings with the environment can raise new challenges and insights into the mechanisms by which individuals experience altered states of consciousness.

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