

Discussion of an Approximated Equation for Spatial Distribution of Controlled Healing Power Around a Human Body

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Abstract: Using a gas measurement method in which pieces of cucumbers (*Cucumis sativus* 'white spine type') were used as bio-sensors, we measured spatial distributions of controlled healing power (J values) around healers. Participants were 5 volunteer-healers and 2 Chinese psychic-healers. Participants each did two 30-minute trials of non-contact healing for the target bio-sensors in front of them. At that time, their spatial distributions of J values were measured at 25 or 50 cm intervals in the front-backward and right-leftward directions from the participants. The spatial distribution of J values of the volunteer-healers was a wave-like distribution similar to that for one of the psychic healers. The wave-like distribution suggested that an invisible layer structure was generated around a human body. Moreover, a possibility was found that a miss-control case in which a healer failed to concentrate his/her power on a target could be distinguished from a powerless case in which the healer did not have any special strong power. The potential distribution of the miss-control could be approximated by a wave function of a 1-dimensional quantum harmonic oscillator, and two possibilities were suggested: healing phenomena follow a certain physical law even if the healers fails to control their power; and the fundamental equation of healing phenomena was a second order differential equation.

Keywords: non-contact healing, J value, bio-sensor, *Cucumis sativus* 'white spine type', potential, spatial distribution, approximated equation, quantum harmonic oscillator

1. Introduction

Since 2006, we have studied non-contact healing by their biophoton measurement method using cucumber pieces (*Cucumis sativus* 'white spine type') as a bio-sensor^{1-15,17}. Additionally in 2009, we successfully developed a gas measurement method in which healing power was measured by the amount of generated gas (odor) of the cucumber¹⁶⁻²⁰. The gas measurement method has a merit that it is easy to do simultaneous multiple-place measurements. Therefore spatial distribution of potential of controlled healing power can be measured if we array many bio-sensors around a healer during a healing task. Through previous studies²¹⁻²², we found that a potential area (radius: about 2 m) was generated around a psychic healer during a healing task; it had a non-Coulomb potential like a wave and it had geometric symmetry, anisotropy, and

reverse-potential areas.

In the present study, we discuss the potential distribution of psychic healers using new additional data and previous data^{21,22}. Next, we compare their distribution with the potential distributions of 5 volunteer-healers. Here, both the terms "power" and "potential" are used only for convenience, the examination of the physical validities of these terms is a future subject.

2. Method

We used the gas measurement method with cucumber pieces (*Cucumis sativus* 'white spin type'). The details of the method have been described elsewhere¹⁷⁻²⁰. Each measurement consisted of healing measurements and simultaneous potential measurements (many bio-sensors were arrayed around a healer).

Healing measurements were done using the simultaneous calibration technique (SCAT)¹⁸⁻²².

Cucumber sample dishes for potential measurements were made in the same way as for

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SCAT^{21,22}). The spatial resolution was 50cm for psychic healers W003 (female, 41 years old) and W004 (female, 43 years old). Dishes for the potential measurement for W003 were set at 4 points at 50 cm intervals in forward, backward, rightward and leftward directions from her;

and 4 points at 45-degree angles between the four directions (about 2.5 m distant from her; designated as oblique) (**Fig. 1**). In the test for W004, dishes were set in forward, backward, rightward and left directions from her and 4 points above her head (**Fig. 2**). In the tests for

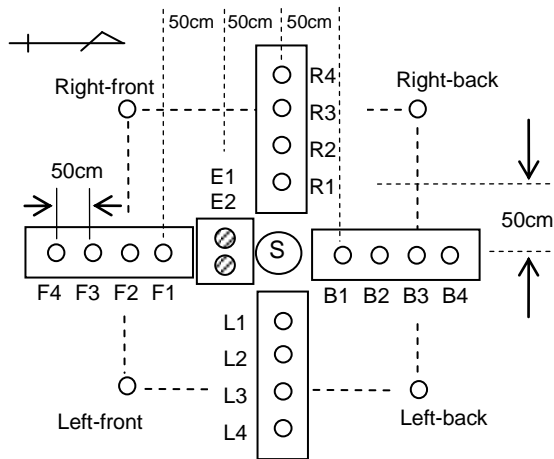


Fig. 1 Arrangement of Samples for W003
June 21, 2010

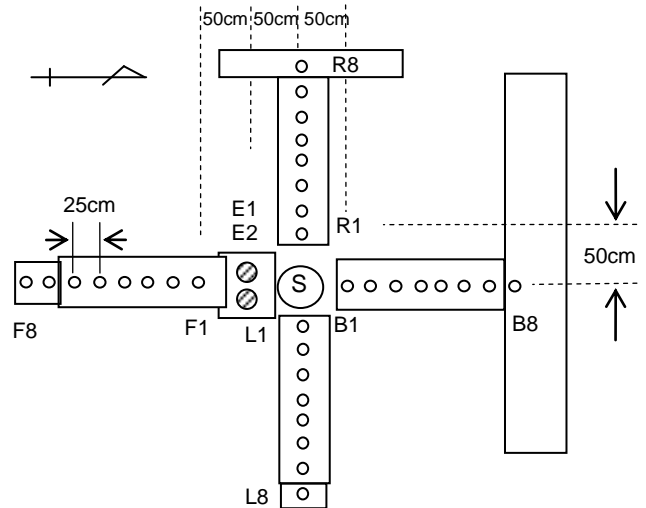


Fig. 3 Arrangement of Samples (Volunteer-Healers)
Spatial resolution: 25 cm.

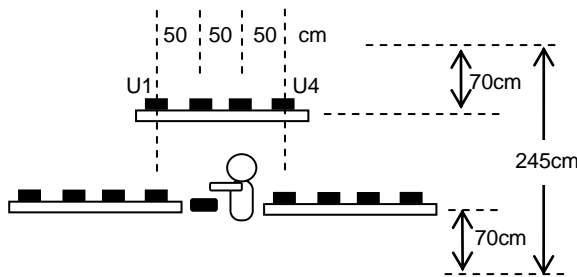


Fig. 2 Changes for Test with W004
August 11, 2010. Four oblique points for W003 were replaced with 4 points above her head.

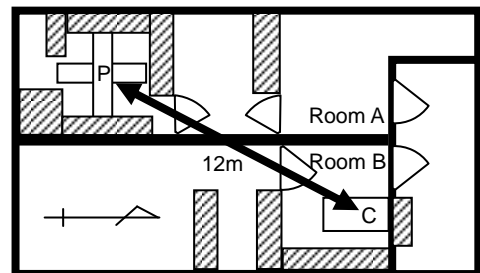


Fig. 4 Participant (P) and Control (C)

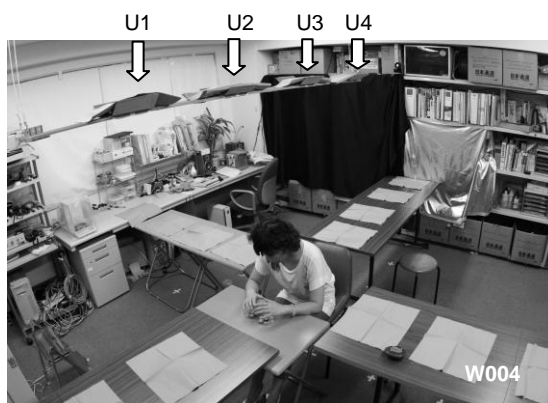


Fig. 5 Healing Trial

volunteer-healers, their potential distributions were measured at 8 points at 25 cm intervals in forward, backward, rightward and leftward directions from them (Figs. 3 & 5).

Control sample dishes and blank test dishes (for SCAT) were kept in another room, 12 m from the healers (Fig. 4) during the healing trials.

3. Outline of Procedure

Procedure was the same as previous experiments^{21,22}. Before experiments, the healer was met at a reception room and the healer signed a document of agreement after the experimenters had explained the present study to him/her. The healer did 2 trials with intention to increase the odor of the cucumber: one trial was 30 min, the interval between trials was about 15 min. After each trial, all lids were removed from the Petri dishes, then the dishes were put into separate 2.2 L sealed plastic containers. Containers were kept in a room at 24 °C for 24 h (Fig. 6). After 24 h, gas samples were measured for each pair of containers. 100 mL samples of gas were taken 3 times (totally 300 mL) from each container using the short-term gas-measuring detector tube for ethyl acetate (Model 141L, Gastec, Japan). *J* value, which is the natural logarithm of the ratio of gas concentrations of experiment C_E and control C_C , was used as an index of controlled healing power.

$$J = k \ln (C_E / C_C)$$

Here, *k* is a coefficient and $k = 1$.



Fig. 6 144 Gas Containers in Shelves

4. Results for W003

The details were described in previous reports^{21,22}. Summarized results for W003 are as follows: in healing tests the 1st trial was $J = -0.131$ and 2nd trial was $J = -0.107$. Totally $J = -0.119$ ($n = 4$) and there was a statistical significant difference between blank tests (t-test, two tails, $p = 0.015$). Results of potential measurements are shown in Fig. 7.

The power exerted by W003 decreased the odor of the cucumber, but we considered that she had miss-controlled her power.

Both graphs of potential distributions in front-backward and right-leftward directions were nearly symmetric. Potential distributions were considered to have geometric symmetry. In Fig. 7, the origin of coordinates in the front-backward direction was located at the mid-point between her body and the target sample dishes for healing.

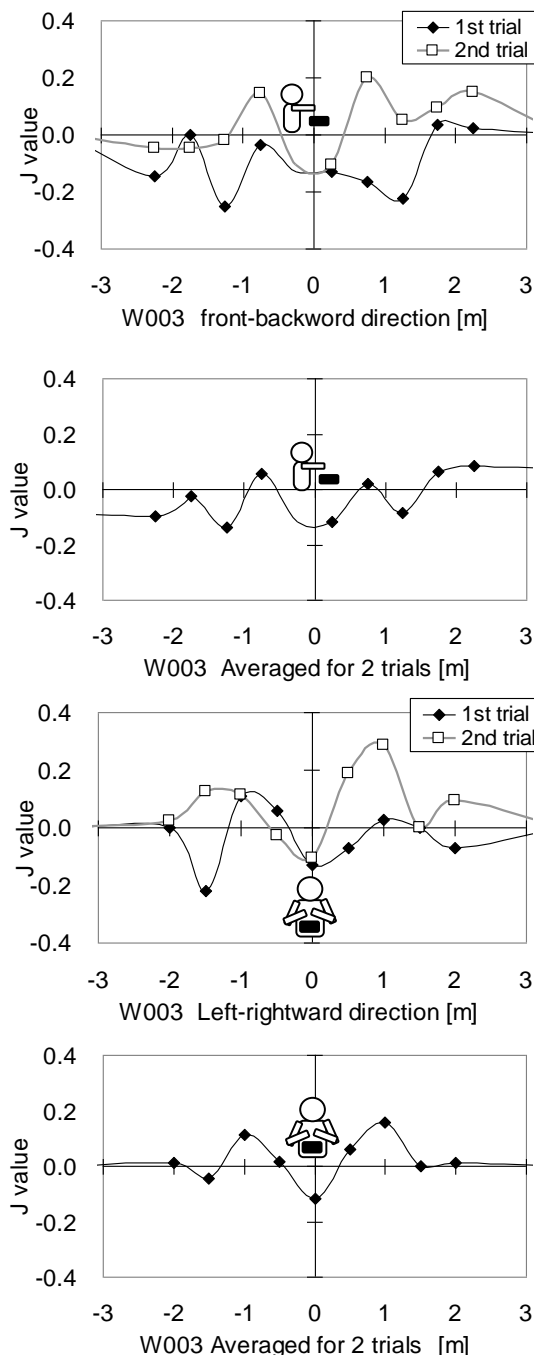


Fig. 7 Potential Distributions for W003 (Upper: Front-backward, Lower: Right-leftward)

5. Results for W004

In healing tests for W004, 1st trial was $J = 0.210$, but the 2nd trial was $J = -0.004$. Also, Fig. 8 suggested that W004 miss-controlled her power.

For the potential distributions, she showed geometric symmetry in right-leftward direction, the same as W003 did. In the front-backward direction, the peaks in her potential distribution were broader than for W003. Frontal and back p-points²¹⁾ were considered to be located at about 2.25 m. In Fig. 8, the origin of coordinates in the front-backward direction was located at the mid-point between her body and target sample dishes for healing.

The area above her head was considered as the reverse potential area.

6. Approximated Equation of Potential Distribution

We can discuss an approximated equation of potential distribution in right-leftward direction because the right-leftward direction seems to more symmetric than the front-backward direction. First, we made the assumption that potential was symmetrical in the right-leftward direction. Next, we calculated standardized J values on the condition that the average J value of healing tests (J_0) was 1 (Fig. 9 Upper), then, standardized J values were averaged (Fig. 9 Lower). At that time, data for the 2nd trial with W004 were omitted to simplify the discussions.

Here, $U(x, J_0)$ is a function of potential distribution, $f(x, J_0)$ is a function which has periodic and damping components of distance x , and U_B is background potential.

$$U(x, J_0) = f(x, J_0) + U_B \quad (\text{Eq. 1})$$

U_B is assumed to have effects similar to healing effects and it exists in our universe and drifts slowly¹⁸⁾. At least in the present discussion, we need to adjust it to zero.

In the calculation for the lower graph of Fig. 9, cosine and Gaussian functions were used as $f(x, J_0)$.

$$U(x, J_0) = J_0 a \cos(2\pi / \lambda \times x) \exp(-cx^2) + U_B \quad (\text{Eq. 2})$$

Here, $J_0=1$, $a = 1.4$, $\lambda= 1.8$ [m], $c = 0.5$ [m⁻²], $U_B=-0.3$.

Equation 2 is a tentative approximated equation; therefore it should be replaced with a more suitable equation. In the next section, we discuss whether Eq. 2 is suitable for data of typical healers or not.

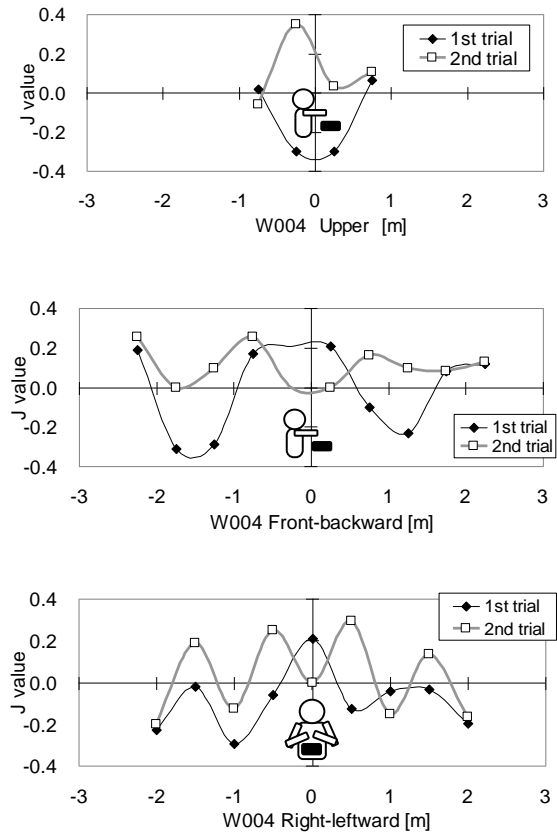


Fig. 8 Potential Distribution of W004

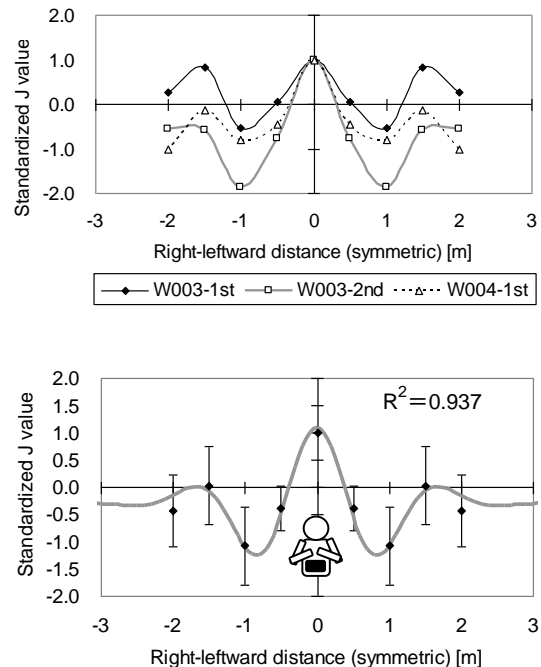


Fig. 9 Standardized Potential Distributions

7. Results of Volunteer-Healers

Five healers were recruited from a list of participants and an internet search. There were 3 males and 2 females. Two (K007 and S012) of them had been tested by the biophoton measurement method previously; K007 had $J = 0.171$ ($n = 8$) in 2006⁴; S012 had $J = 0.145$ ($n = 8$) in 2008¹⁵.

Average calibrated J value (J_0) was $J = 0.124$ and there was a statistic significant difference between healing and blank tests (t-test, one tail, $p = 0.003$). Power of 4 healers was classified into intermediate-class ($0.1 < J < 0.2$) and power of 1 healer was classified into novice-class ($J < 0.1$) (Table 1).

Table 1 Healing Tests by Volunteer-Healers

Healer ID, Gender, year, Trial date	Outliers (>0.5) were omitted			
	Calibrated J		Average J	
	Healing	Blank		
O004 f, 36y Sep 25, 2010	0.278	-0.116	1st trial	0.191
	0.284	0.116	0.281	
	0.355	0.068	2nd trial	
K020 m, 63y Oct 2, 2010	0.006	0.169	1st trial	0.145
	0.188	-0.169	0.097	
	0.066	0.055	2nd trial	
K007 m, 70y Oct 18, 2010	0.321	-0.055	0.193	0.130
	0.096	0.142	1st trial	
	—	-0.142	0.096	
S012 f, 45y Oct 23, 2010	0.188	0.133	2nd trial	0.175
	0.108	-0.133	0.148	
	0.049	0.019	1st trial	
S015 m, 52y Oct 30, 2010	0.190	-0.019	0.120	-0.019
	0.214	-0.142	2nd trial	
	0.248	0.142	0.231	
Average	0.158	0.087	1st trial	-0.019
	-0.156	-0.087	0.001	
	-0.021	0.000	2nd trial	
SD	-0.058	—	-0.039	0.003
	0.124	0.000		
	0.151	0.113		
95% confidence interval	0.073	0.055	141L Lot No. 00639	
p value (one tail)				

Results of potential measurements are shown in Fig. 10 and Fig. 11. Origin was located at the position of healer's body in the front-backward direction (Fig. 10). Both frontal and back p-points appeared at 1.25 m from the origin.

Absolute values of J values of reverse areas were not large in the right-leftward direction. At the end of the leftward direction, J values were so large, and, especially, this tendency was obvious if J_0 was small. The reason was possibly that the monitoring system (VTR, cathode-ray tube TV, etc.) was located at the end of the

leftward direction and the system interacted with the healing power.

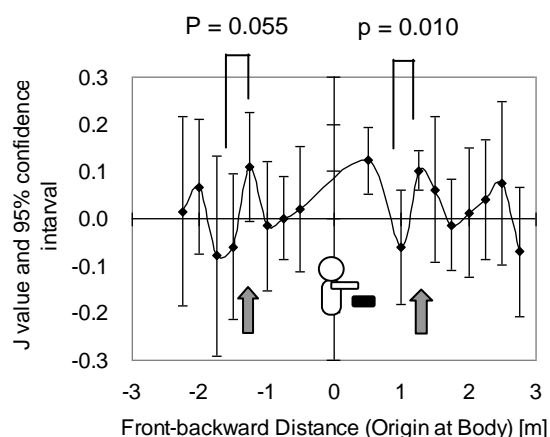


Fig. 10 Front-backward Direction
Volunteer-Healers ($n = 10$). Origin is located at body.

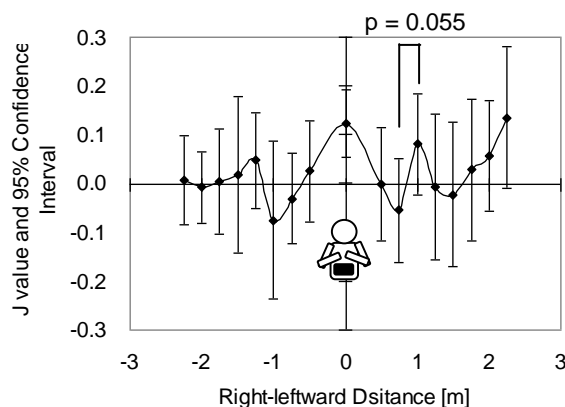


Fig. 11 Right-leftward Direction
Volunteer-Healers ($n = 10$)

The same as in Fig. 9, the largest 3 data ($J_0 = 0.281$, 0.231 and 0.193) were standardized and averaged with the assumption that those data have geometric symmetry in the right-leftward direction. Averaged potential distribution of the largest 3 data of volunteer-healers (Fig. 12) was similar to that for one of the psychic healers (Fig. 9). In Fig. 12, approximated values were calculated by Eq. 2 at $J_0=1$, $a = 1$, $\lambda= 1.6$ [m], $c = 0.5$ [m^{-2}], $U_B=0$.

Even for the volunteer-healers, their potential distributions were the same as those of psychic healers if their power was large enough. Therefore, the wave-like distribution in Figs. 9 and 12 was considered as a basic form of the spatial distribution of healing power.

Fig. 13 shows a 3-D map of standardized J values in the XY plane after interpolation of the points which are equal distance from the origin. Positions of peaks and

valleys in front-backward and right-leftward directions seemed to correspond to each other. However, there was also anisotropy; especially, the nearest valleys in the left-rightward direction were reverse areas. In addition, **Fig. 13** suggested a possibility that the signals of sensor outputs will be changed according to the positions of sensors when we arrange them near a healer.

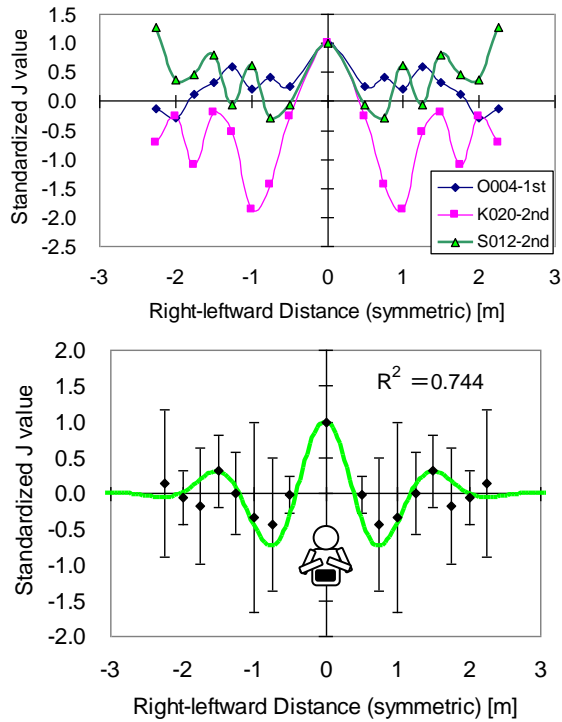


Fig. 12 Standardized Potential Distribution
(Largest 3 data of volunteer-healers)

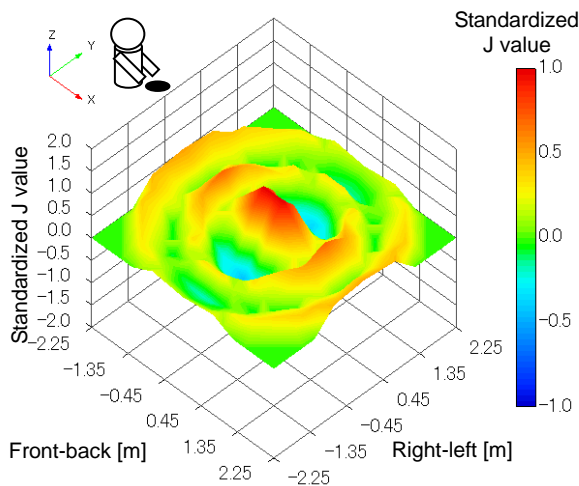


Fig. 13 Presumed Distribution in XY Plane
Average standardized J values of the largest 3 data of volunteer-healers. Spatial resolution: 25 cm.

8. Discussion I

There are many studies on healing, and some have reported that, for example, healing effects can be detected near a healer's body not only at the target, moreover healing effects seem to reach to distant places (10^4 km^{23}). However, we cannot compare our present study with other experimental studies because none like the present study which was focused on precise measurements of spatial distribution of healing power around the human body ($< 3 \text{ m}$). Therefore we discuss the relationship between our experimental results and empirical claims by spiritualists or mystics.

The wave-like potential distribution means that an invisible layer-structure is generated around the human body (**Fig. 14**). It is considered to correspond to a "layer-structure" of a bio-energy field, claimed by spiritualists or mystics, which surrounds the human body. However, all layers are the same kind essentially although the direction and largeness of effects differ. The purpose of the present study was not to examine the empirical claim of spiritualists and mystics. However, results partially support their claim. In other words, the wave-like potential distribution is well-known as a "layer-structure" empirically.

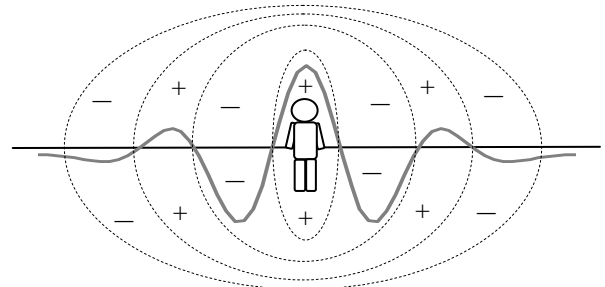


Fig. 14 Wave-like Potential Means Layer-structure

There is no experimental study which has reported existence of frontal and back p-points. However, Brazilian spiritualists (spiritists) have used a unique training in which a trainee projects and concentrates his/her bio-energy at frontal and back places symmetrically (the white pillars in **Fig. 15**), and tries to move those pillars²⁴⁾.

It is unknown when and who created this training way. However, it can be imagined that a sensitive person has been able to feel frontal and back anomalous fields (p-points) and started the training to control those fields. There are similar situations apparently, for example, a qigong trainee tries to control flow of qi/ki to turn it around his body, but he is usually not conscious of existence of the back p-point. In training of clairvoyance

and psychokinesis, a trainee concentrates his attention on a target (it is set in front of the trainee usually), but he is never conscious of a geo-symmetric place (back p-point) relative to the target. In this meaning, this Brazilian training way is relatively rare. However, results of the present study suggest that this Brazilian way has validity.



Fig. 15 Training Way of a Brazilian Spiritualist
http://www.consciencial.org/cd_prat_bio_v2.htm

9. Discussion II Approximation by Wave Function

It is suggested that healing (bio-PK) phenomena follow certain physical laws because healing power (J value) can be described by an equation, such as Eq. 2. However, Eq. 2 is an approximated equation for a case in which a healer successfully controls and concentrates his power on a target. If he miss-controls his power, what distribution will be detected?

Fig. 16 shows distributions of J values for O004 in 1st trial ($J_0 = 0.281$) and 2nd trial ($J_0 = 0.102$). In 1st trial, J value was large at the center (target samples), and J value became small according to distance from the center. On the other hand, in the 2nd trial, amplitude of J value became large according to distance from the center; this tendency was especially obvious in the front-backward direction. This tendency was also recognized in 2nd trial of K007 and 1st trial of S015 (it was obvious in front-backward direction in both cases).

Eq. 2 cannot approximate this tendency well in which amplitudes of J values become so large according to distance from the center (but it is supposed to be convergent to zero possibly if the distance reaches a certain limit).

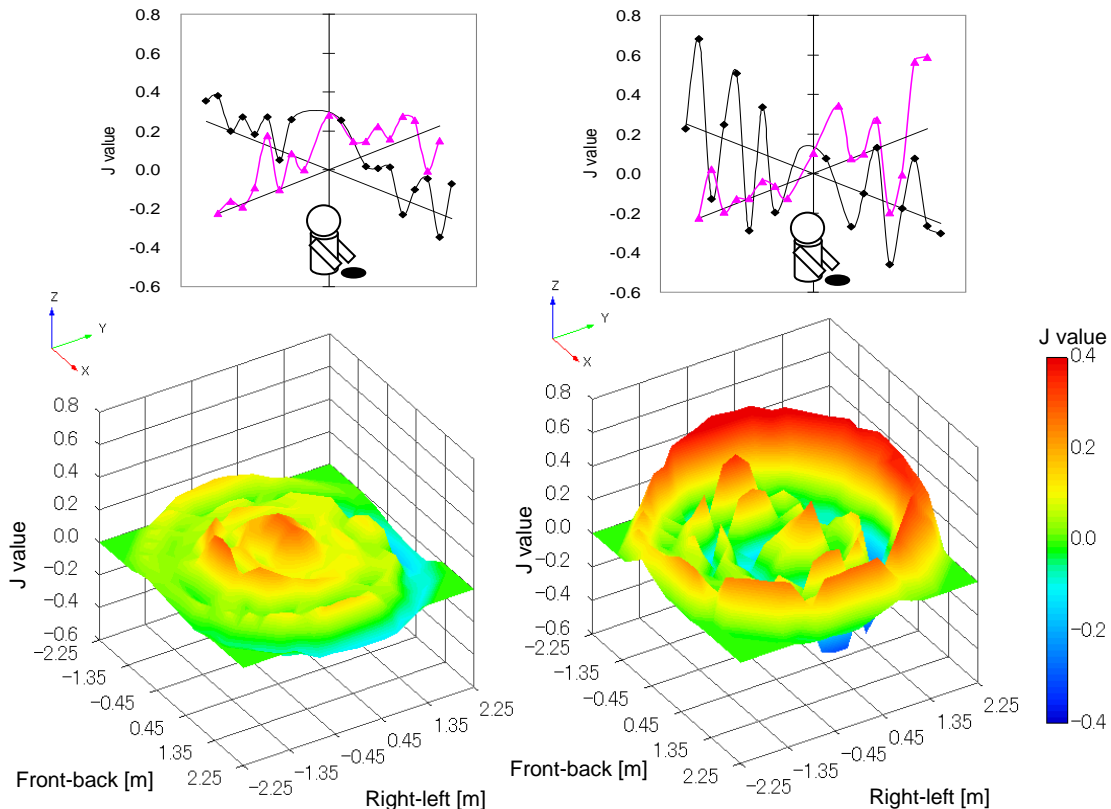


Fig. 16 1st trial (Left) and 2nd trial (Right) for O004

Fig. 17 is an approximation of 2nd trial of O004 in the front-backward direction using the wave function $\Psi_n(x)$ of a 1-dimensional quantum harmonic oscillator. Correlation coefficient between measured and approximated values was $r = 0.648$ ($p < 0.01$) and coefficient of determination was $R^2 = 0.420$.

$$U(x, J) = J_0 \times a \times \Psi_n(x) + U_B \quad (\text{Eq. 3})$$

$$\Psi_n(x) = \sqrt{\frac{\beta}{\sqrt{\pi} 2^n n!}} H_n(\beta x) \exp\left(-\frac{\beta}{2} x\right)$$

Here, $H_n(\beta x)$ is a Hermite polynomial, the term under the square root sign is a normalized coefficient, and $U_B = 0$, $J_0 \times a = 0.55$, $\beta = 2$, $n = 12$. Moreover, other conditions were assumed as follows²⁵⁾,

$$V(x) = \frac{1}{2} Kx^2 \quad \beta = \sqrt{\frac{m \omega}{\hbar}} \quad \omega = \sqrt{\frac{K}{m}}$$

Also, the origin of coordinates in the front-backward direction was located at the position of the healer's body.

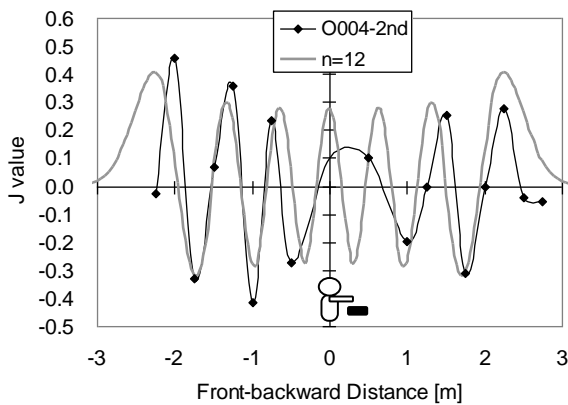


Fig. 17 2nd Trial of O004 (Front-backward Direction)

In the same way, the 1st trial of K007 ($J_0 = 0.096$) can be approximated by Eq. 3 if $U_B = 0$, $J_0 \times a = 0.4$, $n = 12$, $\beta = 1.688$ (**Fig. 18**). The correlation coefficient between measured and approximated values was $r = 0.678$ ($p < 0.01$) and coefficient of determination was $R^2 = 0.462$. However, geometric symmetry was assumed in the front-backward direction, and the origin of coordinates was located at the mid-point between his body and the healing target.

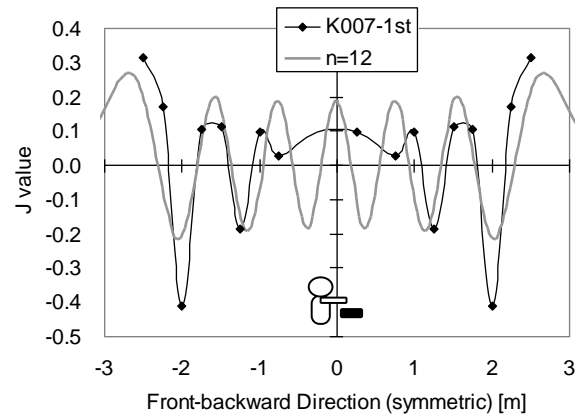


Fig. 18 1st Trial of K007 (Front-backward Direction)

The first trial of S015 could be approximated by Eq. 3 if $U_B = -0.1$, $J_0 \times a = 0.3$, $n = 12$, $\beta = 2.161$ (**Fig. 19**) although his J_0 was nearly equal to zero ($J_0 = 0.001$). However, the degree of approximation was low, and correlation coefficient between measured and approximated values was $r = 0.407$ (not significant) and coefficient of determination was $R^2 = 0.166$. In this case, geometric symmetry was assumed in the front-backward direction, and the origin of coordinates was located at the position of his body.

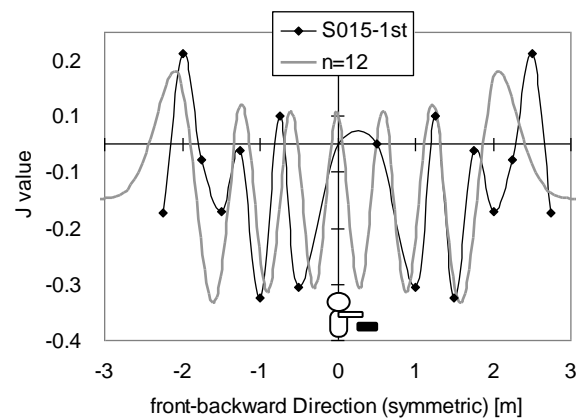


Fig. 19 1st Trial of S015 (Front-backward Direction)

Figs. 17-19 suggest the following possibilities.

- 1) Healer's self-evaluation for magnitude of his healing power is based on total power surrounding his body, not only effective power which is concentrated on a target.

For example, O004 said that she felt more power in the 2nd trial than in the 1st trial. It is not easy to estimate

her true power with enough accuracy because spatial resolution was 25 cm in the present study. Tentatively, mean square J value of the 1st trial was 0.021 (n=18) in the front-backward direction (potential measurement points were 16 and healing measurement points were 2), and that of the 2nd trial was 0.066. The latter value was about 3 times as large as the former. There was a possibility that total power of 2nd trial was larger than 1st trial.

Healer's self-evaluation for magnitude of his power is considered to be related with his expectation for success in the trial. One of reasons there was no significant correlation between J_0 and healers' self-evaluation for success of trials in our studies^{4,7,15)} was possibly caused by the difficulty of concentrating healing power.

- 2) Using data of potential distribution around a healer, we can distinguish cases when he did not have any special power or he miss-controlled his power.

Table 2 shows mean square J_0 of volunteer-healers. S015 was considered to be equal to other healers in total power although his J_0 was small. In other words, although he did not succeed in concentrating his power on the healing target efficiently, there was a possibility that a sensitive person would feel strong power of S015 if the sensitive person was standing near S015.

In our biophoton tests, J values of 1st trial of some veteran healers were small ($J < 0.1$) although they had been expected to have strong power. J values of 2nd trial were sometimes improved if we gave advice to them to increase photon intensity, such as if healers adjusted the distance or direction for the target, or if they changed their healing ways slightly¹⁵⁾. The present study was focused on measurements of potential distribution, and fine adjustment was impossible because the distance for the healing target were fixed as 50 cm. In this sense, some healers had an advantage if they were familiar with the close-type healing way, such as laying-on-of-hands, because they could perform healing with hardly any change in their usual way. On the other hand, other healers should change their ways a little, for example, a qigong healer, who is familiar with distant ways, in which a receiver is made to stand at a place a few meters away and the qigong healer emits his power (qi/ki) to him. S015 (his J_0 was small) is the founder of his original qigong school, and he was possibly more familiar with distant ways. Additionally, in the biophoton measurement method, healers were given feedback information about the 1st trial and got a chance to adjust their ways to the experiments before the 2nd trial because we have only one equipment set-up and the measurement was done only one time a day. However, in

the present study, the measurement was done twice a day, therefore healers could not obtain feedback information before the 2nd trial and could not adjust their healing ways. Some healers, who are familiar with distant ways, would need to become familiar with the experimental environment.

Table 2 Mean Square J Value

		Front-back (n = 18)*	Left-right (n = 18)*	All data points (n = 34)
O004	1st	0.021	0.021	0.018
	2nd	0.066	0.041	0.052
K020	1st	0.015	0.019	0.017
	2nd	0.027	0.051	0.038
K007	1st	0.068	0.015	0.044
	2nd	0.049	0.034	0.043
S012	1st	0.024	0.027	0.026
	2nd	0.053	0.031	0.041
S015	1st	0.034	0.021	0.028
	2nd	0.023	0.039	0.033
Average		0.038	0.030	0.034

* Including 2 healing data points.

- 3) Healing power follows certain physical laws even if a healer miss-controlled it.

The present study shows that even volunteer-healers, not only psychic healers, can generate the wave-like potential distribution (approximated by Eq. 2) if they successfully concentrate large power on the target. This is considered to mean that healing power follows certain physical laws. Moreover, Eq. 3 suggests that healing phenomena follow certain physical laws even if healers fail to control their healing power.

Eq. 3 is a solution of the 1-dimensional quantum harmonic oscillator assuming that the distribution function of J values is a wave function of the Schrödinger equation (similarly, it is expected that Eq. 2 can be replaced with a wave function of a 3-dimensional quantum harmonic oscillator). The potential distribution of healing power can be approximated by the Schrödinger equation, therefore we presume that the fundamental equation of healing (bio-PK) phenomena is a second order differential equation (Eq. 4) which is similar to the Schrödinger equation.

$$\frac{d^2 J}{dz^2} + (\lambda - z^2) J = 0 \quad (\text{Eq. 4})$$

Here, z is a dimensionless coordinate and λ is a parameter which represents a state of the system.

This forecast is based on small numbers of data, and many uncertain factors still remain. However we can expect to identify a fundamental equation of healing phenomena in future if the same study is repeated.

10. Discussion III Biophysical Approach to Healing

Many healing studies have been executed from religious, psychosociological or medical approaches. However, if we use J value as an index of healing power, we can deal with healing phenomena in the same way as common physical phenomena. Therefore, it is expected that a biophysical approach will be developed in the future.

J value corresponds to “psi value” and it is defined as the ratio of logarithms of physical values of experimental and control samples. Available physical values are the biophoton intensity per unit area in the biophoton measurement method and the gas (odor) concentration in the gas measurement method. Additionally, we can use other physical values if the experiments are designed to use sample pairs of experiments and controls. For example, colony formulation of cultured cells can be used to calculate J value and discuss magnitude of healing effects.

Radin *et al*²³⁾ tested non-contact healing (Johrei) with human astrocytes and average colony formulations were 22 in experiments and 17 in controls. Therefore, J value can be calculated as $J = \ln(N_E / N_C) = 0.258$.

Yamauchi *et al*²⁶⁾ tested non-contact healing (laying-on-of hands) with HeLa cells which had been given X-ray at 10 Gy. Average colony formulations were 43.6 in experiments and 23 in controls. J value can be calculated as $J = \ln(N_E / N_C) = 0.639$.

This comparison is preliminary because experimental conditions were different. However, it suggests a possibility that J value of cultured cells is larger than that of cucumber pieces.

Coefficient *k* of J value should be defined if we want to compare results of different experiments. Fortunately, F003, one of the healers in Yamauchi’s cells

experiment in 1996, remained active for 10 years after the experiment. We him by the biophoton measurement method in 2007⁷⁾, and his result was $J = 0.134$. Here, this value is used as reference point for comparison with cells experiments (Yamauchi et al, Radin et al) and cucumber experiments (Kokubo & Yamamoto⁶⁾). J value of F003 is nearly equal to average J value of 14 healers ($J = 0.142$) in Kokubo & Yamamoto’s experiment. Therefore, we assume that the average healing powers are equal in all experiments, and coefficient *k* of cucumber experiment is $k = 1$, then we can calculate *k* of cell experiments.

$$J = k \ln(N_E/N_C)$$

Table 3 suggests that J value of cells experiments is 2 to 4 times that of cucumber experiments. In addition, coefficient *k* of gas measurement method can be considered as $k = 1$ because the average J value ($J = 0.153$) of K007 and S012 in the gas method is nearly equal to that in the biophoton method ($J = 0.158$).

In the above discussions, we assumed that J value also has a role as an index of unknown physical mechanisms which exist as background mechanisms of healing phenomena.

As such, it is possible to compare healing effects against various kinds of illnesses. If we do not use any parameters, such as J value, which seems to relate to common background mechanisms, it is difficult to discuss the reason whether a higher ratio of recovery from a certain illness is caused by strong healing power or caused by a certain biochemical reaction system which has high sensitivity for healing power.

However, the importance of this viewpoint is often forgotten in a medical approach. Although it is a rough generalization, the final goal of medical studies for healing is to identify what part is responsive to healing. If we succeed in identifying where healing affects occur, we can develop a certain medicine or cure which acts on the targeted part directly. Abilities of healers are often instable, and they will not be needed if we establish a new medical method. Many patients will be satisfied

Table 3 Coefficient k in Cultured Cells and Cucumber Piece Experiments

Authors	Bio-sensor	Healer	N_E	N_C	$k \ln(N_E/N_C)$	$1/k$
Yamauchi et al	Colony formulation of HeLa cells	6	48.58 ($n=12$)	23.00 ($n=4$)	0.639	4.5
Radin et al	Colony formulation of human astrocytes cells	4	22 ($n=?$)	17 ($n=?$)	0.258	1.8
Authors	Bio-sensor	Healer	I_E	I_C	$k \ln(I_E/I_C)$	<i>k</i>
Kokubo & Yamamoto	Biophoton intensity from cucumber piece	14	88192 ($n=106$)	75890 ($n=106$)	0.142	1

with the new method if it is effective for recovery even if the physical mechanisms of the healing phenomena are still unknown.

In contrast, in the biophysical approach such as the present study, the goal is to reveal the background physical mechanisms of healing. Although the gas amount and photon intensity of cucumber are not related directly to medical cures for humans, those parameters should be used if they are useful to study physical mechanisms of healing phenomena. The concepts of bio-sensor and J value are very important in the biophysical approach.

11. Further Tasks

The items below should be discussed in further studies.

(1) Spatial resolution was 25 cm in the present study, but it should be improved.

(2) Oblique directions and vertical directions should be measured.

(3) Reliability of data of potential measurements should be improved by SCAT.

(4) New methods are needed to analyze data when healers failed to concentrate their power on the target well.

(5) It should be studied whether a layer-structure is generated around a person when he does not emit healing power.

(6) Vasilescu & Vasilescu²⁷⁾ reported that telepathy could be amplified if they used equipment amplifying radio waves at a wavelength of 46.20 m (6.5 MHz). Also in the present study, J values seemed to increase at left edge (right edges in **Fig. 11** and **Fig. 16 (Right)**) where the monitoring system was set and was operating. There is a possibility that the increase of J value was caused by interaction with electric devices. Therefore, we should turn off as much of the equipment as possible in further studies. Moreover it is important to test the possibility that healing power can be amplified by interaction with electric devices.

12. Conclusions

A wave-like potential distribution was generated around a human body during a healing task. This potential distribution partially supports an empirical claim that a human body is surrounded by an invisible layer-structure. Moreover, there is a possibility that a basic equation of healing phenomena is a second order differential equation because the potential distribution of healing power can be approximated by a wave function of a quantum harmonic oscillator

Acknowledgements

We express special thanks to Mrs. Bing Wang, Mrs. Qiang Wang, the volunteer-healers and collaborators. Part of the present study was supported by the scientific program of the Bial Foundation (Portugal), Sakamoto Masamichi Frontier Project (Japan), and Azuma Nagamasa Memorial Fund for Parapsychology (Japan).

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