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An Experiment on Unknown Subconscious Information Transfer with Auditory Brain Evoked Potential

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Abstract: In order to verity that a subject's brain is able to identify selected sounds, even if the subject can not identify the selected sounds significantly by the normal auditory sense, a series of trials were performed on the subject who tried to identify the sound selected prevviously at random by computer while listening to four sounds generated during trials. This paper will demon strate that the subject's significant shift of latency was detected on he sauditory brain evoked potential peak while he listened to the selected unknown targets, and will suggest the possibility of unknown information transfer in the subconsciousness.

Keywords: subconscious, extrasensory, information transfer,brain evoked potential, P_2 peak latency

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1. Introduction

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It is clear from our experiences that our conscious recognition is based mainly on the information obtained through sensory receptors. However, it can not be ignored to some extent, that our subconscious recognition is also based on the information obtained without the sensory receptors.

Warren et al.[1)] suggested man's extrasensory recognition by means of visual brain evoked potentials in their experiments.[2,3)] This paper will report an investigation on the possibility of the extrasensory recognition through an experiment on brain evoked potentials generated by auditory stimuli.

2. Method

A subject will listen to a pulse of sound which has a tone of around 630 Hz (approximately within ±10% variation) for a duration of 50 ms in order to allow a measuring system to record his electroencephalogram (EEG) for 1 sec before and after the event at his right frontal (F_4) applying the monopolar method with a reference electrode at the right earlobe. Each trial is composed of 4 pulses of sequential tones at intervals of 3 sec, and the subject will try to identify one target among the 4 tones. The pitches of the 4 tones that include one target are to be determined by a computer at random just before each trial without informing either the subject or an experimenter. Immediately after each trial, the subject has to enter to the computer his guessed target No. of the tone. The computer will then record both target No. and his guessed No. and will display it to the subject and the experimenter only whether both numbers are in agreement or not. One hundred trials will be repeated with the same subject who will proceed following the dialogue displayed at the computer while only the experimenter will monitor the process. The scheme of experimental apparatus is shown in **Fig. 1**. The sequence diagram of one trial is shown in **Fig. 2**.

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A pair of EEG's, one for target, the other for non-target will be selected from 4 sequential EEG's in each trial. Care must be taken so that the sets of target EEG's (T,Ⓣ) and the other sets of non-target EEG's (N,Ⓝ) should be equal size in order to make equivalent sets (T, N) from the point of view of the subject's consciousness (see **Fig. 3**). A statistical test will be performed on the difference to be calculated from auditory brain evoked a pair of potential curves that will be obtained from a pair of sets of EEG's, one for selected targets and the other for selected non-targets.

3. Results and Analysis

The subject is a healthy man of 50 years old. Results of his guessed target are shown in **Table 1**. *p* indicates a probability of occurrence by chance of guesses that could have no less deviation than the result of the table has.

Only two trials with artifacts in EEG data were found in 100 trials. The auditory brain evoked potential curve is

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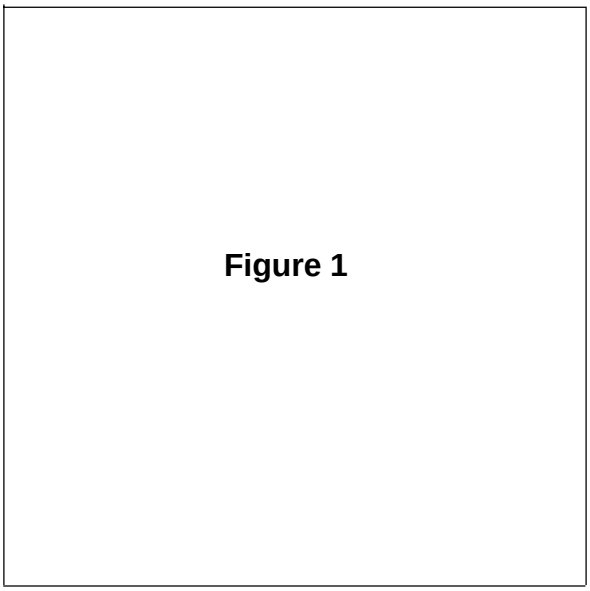

Fig. 1 Scheme of Experimental Apparatus
Upper computer is for processing extrasensory transfer experiments; the lower, for monitoring EEG. Upper center switch is used for EEG recording ON/OFF.

Table 1 Result of Target Guess

Hit	Miss	*p*
30	70	0.12 (>0.05)

shown in **Fig. 4**. The curve was ob-tained from the average of 392 EEG data excluding the two trials, i.e.,including 98 trials on the other hand. **Fig. 4** shows such P_1, N_1, P_2 and N_2 peaks as are characteristic of potential curves. **Fig. 5** shows a pair of curves of auditory brain evoked potentials that were composed of two sets of selected 98 samples out of the trials, one for thetargets, the other for non-targets. The magnitudes of the peaks, P_1~N_2 were almost the same between the two curves, but differences in latencies (latency: delay time between pulse and peak) of most peaks existed on the pair of curves.

In order to test the statistical significance of the differences, 98 pairs of EEG data composed with one for target and the other for non-target were divided into 10 classes; for each class, two averaged potential curves, one for a class of targets and the other for a class of non-targets were calculated; latencies of the peaks P_2 of both averaged potential curves were taken as test data. Two-sample-test(t-test) was carried out for the samples of the two sets of 10 data, the one for the targets, the other for the non-targets. The result is shown in the **Table 2**. The *p* indicates a probability of occurrence by chance of sampling which could give more difference than that calculated from the

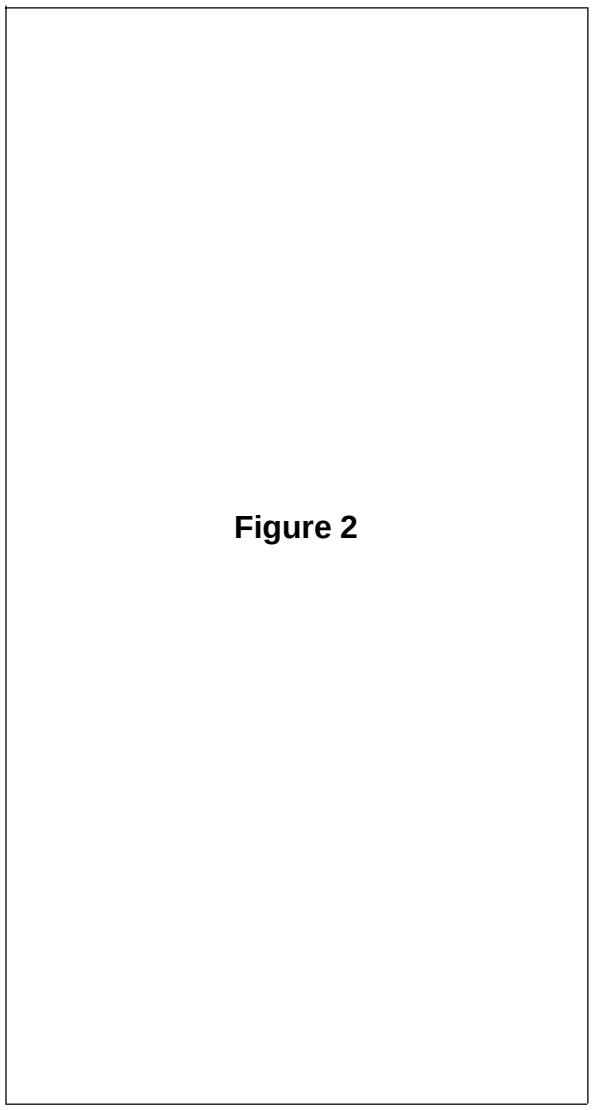

Fig. 2 Sequence of a Trial

Table 2 Two-sample-test Result on Latencies of P_2 Peaks

	Mean (ms)	Sample Variance	*p*
Target	132.5	223.0	<0.05
Non-target	121.7	95.7	

average value for 10 data of targets and the one for 10 data of non-targets as shown in the **Table 2**.

4. Conclusion

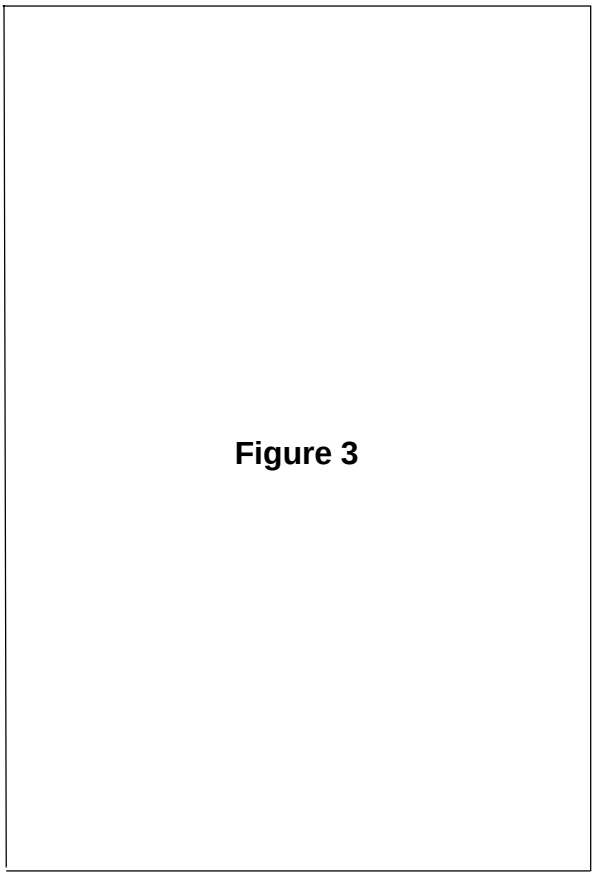

Fig. 3 Selection Example of a Pair of Target EEG / Non-target EEG

T : target, N : non-target, ◯: guessed

The result of conscious recognition by means of guessing targets was judged not significant at a 5% level of significance (one-tailed), which demonstrates that there exists no extrasensory recognition in subject's consciousness. However, the difference of the latencies of the peaks P_2 of auditory brain evoked potential curves calculated between targe and non-target was judged significant at a 5% level of significance (one-tailed), which demonstrates that there exists an extrasensory recognition in the subject's subconsciousness.

The experimental report of Warren et al.[1] and this report also performed their experiments on one subject. In future, authors wish to verify the universality of extra sensory recognition in the subconsciousness with a greater number of subjects.[4]

Acknowledgement

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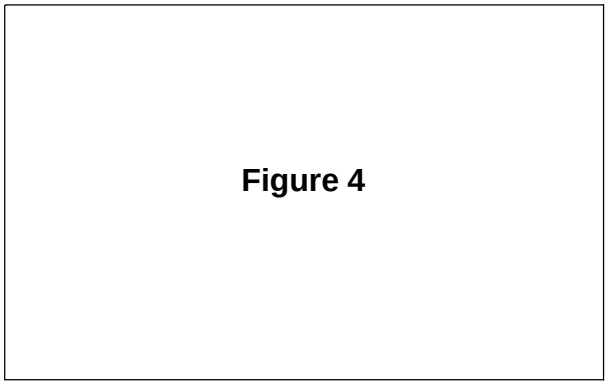

Fig. 4 Auditory Brain Evoked Potential Curve

Obtained from 392 EEG times of data (98 trials x4) averaged

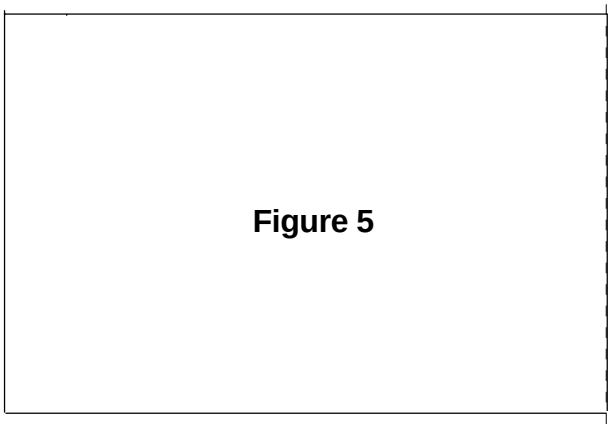

Fig. 5 Auditory Brain Evoked Two Potential Curves

Obtained each from average on either 98 targets or 98 non-targets

References

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