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Direct Mental Influence on Random Event Generators

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by

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Abstract

Effect sizes established by individual operators intentionally influencing random event generator (REG) functioning have been studied over the past few decades. Moreover, random event generator functioning seems to be influenced by collective groups without intention and a resonance that remains in certain geographical areas. The present study explores the relation between random event generator functioning in trials with intention (using the PseudoREG with the PEAR Classic computer program) and trials without intention (using Psyleron FieldREG software). The objective of this research is to find the individual characteristics affecting direct influence of the mind on these types of machines. The study took place at the King's University College psychology labs. There was a total of 30 participants recruited from consciousness courses at King's University College, the Psychology 1000 participant pool, and the community (21 females, 9 males) with a mean age of 22.90 years (SD=6.91, age range: 18-55). No definitive effects were found.

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Direct Mental Influence on Random Event Generators

"Where science has progressed the farthest, the mind has but regained from nature that which the mind has put into nature" (Kragh, 2011, p. 15). In other words, it is believed that we are the ones who directly manipulate reality and then we uncover what it is that we've done. Knowledge acquisition is an active process lead by the human mind and the mind directly influences reality itself.

The study of consciousness refers to the subjective events that occur privately within a person. Despite the fact that it may be difficult to wrap one's head around, there is compelling evidence that human consciousness has non-local properties, which occur infinitely in space and time (Dossey, 2007). Non-local properties can include both non-local perception and non-local influencing. In terms of non-local influencing, under certain conditions it is possible for humans to mentally influence the cognitions, emotions, behaviours, and the physiological and physical activities of other living organisms along with material objects, even beyond physical reach. The purpose of this study is to explore the mechanisms by which non-local influencing occurs in hopes to provide important information about the study of consciousness, our unused and primary potentials and the spiritual components of our lives (Braud, 2003).

Random Event Generator Cases

Psi includes a variety of phenomena that cannot be explained by ordinary science or in other words are "anomalous". Psychokinesis (PK), a form of psi, is the movement of animate or inanimate objects with the mind. Early PK experiments originated in the 1940s and included tossed coins and bouncing dice (Broderick & Goertzel, 2014). In the 1970s, Schmidt presented the random even generator (REG) as innovative technology for studying PK experiments (Braud,

2003). The REG uses quantum processes to create random events which are similar to the mechanism of flipping a coin (Barušs & Mossbridge, 2016).

In more mechanical terms, the REG uses the concept of quantum tunneling. This process produces random sequences of two possible outcomes through the electrons in the current of a diode (Psyleron, p. 8). The currents "depend on the ability of electrons to cross an energetically forbidden region" (Broderick & Goertzel, 2014, p. 220). In other words, the probability that the electron will appear in the energetically forbidden region is determined statistically. We can think of these statistically determined streams as pulses of pluses or minuses. The noise from the diode is then amplified in order to create an arrangement of random digital pulses that can be displayed in order to determine if those pulses conform to regular alternation (Jahn et al., 1987).

In one of the more common REG modes, 200 pulses total to form a single trial (M = 100, SD = 7.07). Any REG is intended to yield an expected mean of 100. Therefore, the difference between this expected mean and the actual mean values will create a deviation that may be significant or not. If the deviation is significant, then it is less likely that the output was random. A number of trials form a run, and subsequently a number of runs form a series. The runs, in which a participant tries to create a deviation from the expected value, can take three forms. In a high intention run, the participant's goal is to increase the mean of the trial counts over the run. In a low intention run, the participant's goal is to decrease the mean of the trial counts over the run. And in the baseline run, the participant has no intention or no goal to alter the outcome (Broderick & Goertzel, 2014).

Successful cases with the REG demonstrating mind over matter can be illuminated by the Princeton Engineering Anomalies Research Program or PEAR Lab research. The PEAR lab conducted a variety of experiments on "the ability of human intention to affect physical

systems," which in this case is the effect on machines such as the REG (Broderick & Goertzel, 2014). All subjects, or operators were uncompensated volunteers who were interested in participating in their studies. This is crucial information because only some people were found to yield positive results with human-machine interaction experiments, and expectation may play a role, which will be later discussed.

Throughout the first years of PEAR lab experimentation, results confirmed the capability of human consciousness to influence the physical world. Significant correlations were found between human intentionality and machine functioning. The high and low intention output distributions in these initial experiments, which included 33 individual operators, were able to display a significant difference from the baseline runs (Dunne & Jahn, 1992). These output distributions gave $z = 3.61$ ($p = 2 \times 10^{-4}$). Dunne & Jahn (1992) note that a similar experiment using a random mechanical cascade device, including 25 individual operators, also produced a significant difference and yielded a *Z*-score of 3.89 ($p = 5 \times 10^{-5}$).

A meta-analysis of PEAR experiments showed that single operators using a common mode of the REG gave $z = 3.81$ and showed a significant effect, $p = 6.99 \times 10^{-5}$ (Jahn et al., 1997). In addition, Jahn et al. (1997) collected mean shift data "over a 12-year period of experimentation [and] 91 individual operators" (p. 349) and found significant deviations for high intention runs ($M = 100.03$, $SD = 7.07$, $z = 3.37$, $p = 3.77 \times 10^{-4}$), low intentions runs ($M = 99.98$, $SD = 7.07$, $z = 12.02$, $p = .02$) and high-low separations ($z = 3.81$, $p = 6.99 \times 10^{-5}$). A chi-square analysis of all human-machine data conducted by Broderick & Goertzel (2014), which includes the data of the REG, shows that it is unlikely that these effects occurred by chance. Particularly, "the likelihood that these results are due to random noise or coincidence is one in ten trillion" (Broderick & Goertzel, 2014, p. 234).

Examples of Non-Conscious Mental Influencing

Many generations of the REG exist. The FieldREG uses a different mechanism to analyze the output from the REG, in that there are no stated intentions, the machine is just running. It was created in order to determine if groups of people can influence REG devices without directed conscious intention. In other words, the REG is responding to a possibly existent consciousness field, in which interacting participants produce (Nelson et al., 1996).

Let's consider the results of a single portable REG that was left running while a group of people simultaneously watched a sunset. Deviations were found to have occurred in a synchronous manner with the activity of the group of people watching the sunset, best described to be in a trance ($p = .01$). This is believed to be an example of group resonance or group cohesion (Barušs, 2007). The idea is that there is some sort of emotional harmony in the group.

Venues that have showed to have anomalous FieldREG effects included sacred sites, such as the national park Carter Lake and sacred ancient Egyptian sites. Several music and theatre sites have also yielded positive effects including the Bayreuth Opera and the New York City opera. Group rituals that are based on the notion of unity have been found to show significant results as well (Nelson et al., 1998) Furthermore, a chi-square analysis conducted by Nelson et al. (1998) showed that the positive anomalous effect found for venues demonstrating emotional engagement and enthusiasm by participants was not likely to occur by chance, $\chi^2(63) = 139.33$, $p = 1.08 \times 10^{-7}$, whereas null effects prevailed for venues where intellectual engagement was present, $\chi^2(99) = 77.36$, $p = .95$. This suggests that rational thinking might interfere with anomalous effects on the REG.

All in all, group consciousness can distort random processes in a given vicinity and emotion seems to play a role (Broderick & Goertzel, 2014). Correspondingly, it has been

proposed that the subjective aspects of consciousness are highly related to group resonance (Nelson et al., 1998). In assessing the effect of Johrei, a Japanese healing technique, on operators involved in human/machine experiments, Jahn, Dunne & Dobyns (2006) indicated that:

> when the convocations generate a high degree of emotional resonance among the participants, the outputs of the digital electronic FieldREG units tend to display mean shifts that deviate from the chance expectation, even though the participants typically are unaware of the presence of the device. (p. 2)

Therefore, studying the subjective factors that may be involved with direct mental influence, such as emotion, may be useful in terms of understanding the mechanisms by which it occurs. Emotion can be measured with the use of the Phenomenology of Consciousness Inventory.

Existence Study Versus Exploratory Study

In addition to supporting the existence of remote influence, it is important to understand the nature of it and under what conditions it is most likely to occur. It is one thing to show evidence for the existence of such a phenomenon and another to explore the factors that predict its occurrence. The present study explores the possibility of an overall effect, but the true purpose is to look for some of the parameters in which direct mental influence occurs. Possible conditions that improve the rate at which direct mental influence occurs on other individuals include “belief, confidence, positive expectation and appropriate motivation” (Braud, 2003, p. xxxiv). These conditions may be affected by beliefs about consciousness, spirituality and altered states of consciousness.

Jahn et al. (1997) also noted that “if there is any commonality to be found in this diversity of strategy, it would be that the most effective operators tend to speak of the devices in frankly anthropomorphic terms, and to associate successful performance with the establishment of some

form of bond or resonance with the device" (p. 359). For example, Baruss & Mossbridge (2016) discuss the case of Susan Padfield who was able to move a light mobile with her mind. She explained that the mechanism by which she could accomplish this task was to identify with the desired end-state of the mobile. In other words, a bond between Susan and the end-state of the mobile was established in order to achieve the outcome.

Difficulties with Direct Mental Influence Research

A temporal effect is described in direct mental influence experiments where extreme scores are more prominent at the beginning and at the end of a series, in comparison to runs found in the middle of a series (Dunne et al., 1994). This leads to a U-shaped pattern of scores. Dunne et al. (1994) note that effects seem to be more extreme when operators are aware of their progress and when there is no observer present. This can go to show how expectation can play a role on the results in intentional trials. If one believes that they are doing well, or can do well, it seems to be that they are more likely to succeed in their intentions. Individuals who are not convinced that direct mental influence is possible or that they are not capable of it, may also produce the opposite of the intended effect. This is called psi-missing (Barušs & Mossbridge, 2016). Dunne & Jahn (2003) also suggest that an operator's rational expectations can act as an information filter on direct mental influence processes. This information filter may also cause psi-missing.

Furthermore, Dunne et al. (1994) propose that an experimenter effect can exist in these types of experiments. In other words, the presence of another individual during the operator's attempts to influence the random event generator, can alter the effect that the operator has on the machine (Barušs & Mossbridge, 2016).

Hypotheses

The objective of this research is to find some of the parameters affecting direct influence of the mind on random event generators. In addition to looking at these individual differences, the relationship between the FieldREG and the traditional mode of the REG with stated intention is also being looked at.

1. It is hypothesized that there will be a significant deviation in the intended direction.
2. It is hypothesized that trials without directed conscious attention will predict trials that are completed with intention.
3. The Beliefs About Consciousness and Reality Questionnaire (BACARQ) is used for measuring beliefs. It is hypothesized that individuals with a high composite score on the BACARQ will be more likely to deviate the REG in the intended direction.
4. The Expressions of Spirituality Inventory (ESI) is used for measuring spirituality. It is hypothesized that individuals with a high composite score on the ESI will be more likely to deviate the REG in the intended direction.
5. It is hypothesized that individuals who are in an altered state of consciousness, as indicated by the Phenomenology of Consciousness Inventory (PCI), will be more likely to deviate the REG in the intended direction.
6. It is hypothesized that those that identify with the machine or feel a transcendent unity with it will be more likely to deviate the REG in the intended direction.
7. It is hypothesized that those who think they can alter the machine will also be more likely to deviate the REG in the intended direction.

Method

Participants

There was a total of 30 participants (21 female, 9 male) recruited from consciousness courses at King's University College, the Psychology 1000 participant pool, and the community with a mean age of 22.90 years (SD= 6.91, age range: 18-55). As for levels of education, "High School Graduate" was the most frequent highest level of education. The most frequent religious affiliations were "Christian" and "None" with nine participants each, followed by "Own Beliefs" with eight participants, "Other" with three participants, and "Muslim" with one participant. The most commonly reported frequency of religious practice was "Never".

There were 18 participants who were from the psychology 1000 pool and 12 participants who were volunteers from outside the participant pool. Due to the fact that expectation and beliefs about consciousness have been found to be important in terms of experiencing transcendental phenomena, some participants are expected to be more likely to deviate the random event generator in comparison to others. It is presumed that students who are currently enrolled in consciousness-related courses are more interested in and are more likely to believe in the effect of direct mental influence. For this reason, these students were asked to volunteer in the study through an announcement made in lectures. Any other students that wished to participate from the King's introductory psychology student participant pool recruited through SONA or any volunteers from the community that heard about the study through the investigators were recruited as well. These volunteers from the community were invited to join the study on the basis that they were interested in the study of consciousness.

Participants from the introductory psychology pool were granted a credit towards their introductory psychology class for completion of an assignment. There were no other forms of compensation.

Materials

Random event generator. An electronic random event generator (REG) linked to FieldREG software for analysing its output was used for the study. The REG is a device that produces random signals that are created at the level of electrons and atoms. It is helpful to think of the REG as an electronic coin flipper. The REG also produces a sequence of random binary outcomes, but instead of heads or tails, it creates ones or zeros. Each one or zero can be regarded as an individual event.

PseudoREG. A PseudoREG, or the random number generator on a computer, linked to Psyleron Classic REG software was also used for the study. The output has the same format as the REG but is deterministic rather than probabilistic in nature.

Measures

Demographics and attitudes form. This form can be found in Appendix A and includes questions about the participant's age, gender, education, religion and frequency of religious practice. It also includes a Likert-type question asking whether or not participants believe that they can alter the functioning of the REG with one being "Defnitely Not" to five being "Definitely Yes".

Beliefs about consciousness and reality questionnaire. The Beliefs About Consciousness and Reality Questionnaire (BACARQ) was developed by Barušs and Moore in 1998. There is a total of 38 items on the scale and questions one to eight use a four-point Likert scale from one being "Definite No" to four being "Definite Yes." Questions nine to 38 use a seven-point Likert scale with one being "Strongly Disagree" to seven being "Strongly Agree." There are seven dimensions that are measured with this scale including antiphysicalism, religiosity, meaning, extraordinary experiences, extraordinary beliefs, inner growth and transcendentalism. Transcendentalism is the global scale made up of all items. A sample item from the antiphysicalism

dimension is, “Human consciousness would not exist without the brain” and a sample item from the extraordinary beliefs dimension is “There is a universal consciousness of which individual consciousness is but a part.” Reverse items are items 9, 19, 24, 29 and 32. A higher cumulative score on the BACARQ is indicative of more transcendental beliefs. The Chronbach’s alpha for all of the items summed to form a single scale was $\alpha = 0.95$.

Expressions of spirituality inventory. The revised version of the Expressions of Spirituality Inventory (ESI) was developed by Douglas MacDonald in 2000. There is a total of 32 items on the ESI. It is an instrument that uses a five-point Likert-type scale with zero being “Strongly Disagree” to four being “Strongly Agree.” It is designed to measure five descriptive measures of spirituality. The five dimensions include: experiential/ phenomenological dimension, cognitive orientation towards spirituality, existential well-being, paranormal beliefs and religiousness. A sample item from the cognitive orientation towards spirituality dimension is, “Spirituality is an important part of who I am as a person” and a sample item from the paranormal beliefs dimension is, “It is possible to communicate with the dead.” Reverse items are items 3, 8, 13, 18, 19, 23 and 28. A higher cumulative score on the ESI is indicative of more spiritual beliefs. The Chronbach’s alpha for the cognitive orientation towards spirituality dimension was reported at $\alpha = 0.87$, $\alpha = 0.81$ for the experiential/ phenomenological dimension, $\alpha = 0.80$ for the existential well-being dimension, $\alpha = 0.82$ for the paranormal beliefs dimension, and $\alpha = 0.89$ for the religiousness dimension.

Phenomenology of consciousness inventory. The Phenomenology of Consciousness Inventory (PCI) was developed by Pekala in 1991. It is a retrospective report that is used to evaluate the characteristics of the state of consciousness in which a participant found himself or herself during any particular time, or in this case as the random event generator was running.

There is a total of 53 items on the scale and opposing statements are separated by a seven-point scale. This scale is composed of 21 subscales and many dimensions of subjective experience including: joy, sexual excitement, love, anger, sadness, fear, body image, time sense, perception, meaning, imagery amount, imagery vividness, direction of attention, absorption, self-awareness, altered state, internal dialogue, rationality, volitional control, memory and arousal. The altered state subscale was used to see if it predicts the difference between high and low intention runs. In addition, all other subscales were checked to see if they can predict the criterion measure. A sample item from the altered state subscale is, "My state of awareness was not unusual or different from what it ordinarily is 0 1 2 3 4 5 6 I felt an extraordinarily unusual and nonordinary state of awareness" and a sample item from the volitional control subscale is, "The thoughts and images I had were under my control; I decided what I thought or imagined 0 1 2 3 4 5 6 Images and thoughts popped into my mind without my control." The Chronbach's alpha for the subscales ranged from $\alpha = 0.72$ to $\alpha = 0.91$.

Questions about experience. These 3 questions can be found in Appendix B, and include an open-ended question about the participant's experiences with the REG followed by two items that use a five-point Likert-type scale with one being "Definitely Not" to five being "Definitely Yes". The first measures belief about REG influence and asks whether or not participants believed that they had been able to alter the functioning of the REG. The second measures resonance and asks whether or not participants had felt at one with the REG.

FieldREG software. FieldREG software, registering input from the REG, was used in the background to accumulate data. It appears that the FieldREG deviates from random behaviour during meaningful, emotional or intellectual events, as a result of a consciousness field. Cumulative scores were collected and analysed for statistical significance.

Psyleron Classic REG software. In comparison to the FieldREG which is used passively, the PseudoREG was used to measure direct conscious intention. The PseudoREG was used with Psyleron Classic REG software. The PEAR Classic program is a computer program that is a recreation of the original protocols used at the Princeton Engineering Anomalies Research lab at Princeton University. The goal is to try to "go high" or "go low" and performance is shown on the computer screen with a cumulative deviation graph. Cumulative averages for high intention runs and low intention runs were collected and the differences were analysed for statistical significance. The PEAR Classic Program was used for a total of 20 runs. A balanced series was required and participants were asked to perform 10 high intention runs and 10 low intention runs.

Procedure

The study took place in the King's University College psychology labs. Consent forms were handed out to participants at the beginning of the session. The participants were informed that the FieldREG would be turned on while they were asked to complete a survey package including the following in order: a demographics and attitudes form, the BACARQ and the ESI. The FieldREG was then turned off and the participants were asked to the fill out the PCI based on their experience while filling out the questionnaires. PseudoREG trials then commenced, where the participants performed a total of 20 runs where they were asked to deviate the REG in the intended direction. A balanced series was required, and therefore it was necessary that the participants completed 10 high intention runs and 10 low intention runs. In a high intention run, the participants' goal was to increase the mean trial counts over the run, whereas in a low intention run, the participants' goal was to decrease the mean trial counts over the run. The PseudoREG was set up at 50 trials per run, 1000 total trials and 4 trials per second. The PseudoREG was then turned off and the participants were asked to fill out another PCI based on their experience with the

PseudoREG, followed by three questions about their experience. Finally, participants were debriefed and were given a debriefing form. Participants from the introductory psychology participant pool were then given an opportunity to complete the bonus assignment in order to obtain their course credit.

Design

The present study is a correlational study with FieldREG mean scores, BACARQ cumulative scores, ESI cumulative scores, PCI scale scores, resonance scores, and belief about REG influence scores as predictor variables and the difference between high and low intention runs as the criterion variable. All variables are continuous variables.

Results

Tests of Hypotheses

The first hypothesis was tested using a t-statistic, with the remainder being tested using simple linear regression analyses. Regression analyses were used to see if the criterion variable, the difference between high and low intention runs, could be predicted from the values of the predictor variable.

Hypothesis 1. The mean difference for high intention runs and low intentions runs was −0.83 (*SD* = 0.36). A one-sample *t* test was not significant, with $t(29) = -1.26$, $p = .22$ (two-tailed), providing no evidence in support of there being a significant deviation in the intended direction.

Hypothesis 2. The correlation of the FieldREG average with the difference between high and low intention runs was $r(28) = .06$, $p = .75$ (two-tailed). When running the stepwise linear regression, the variable was not entered into the regression equation because the probability of the correlation between the predictor and the criterion was above .05, which was the probability

to enter. Therefore, trials without direct conscious intention did not predict trials with direct conscious intention.

Hypothesis 3. The correlation of the composite score on the BACARQ with the difference between high and low intention runs was insufficiently significant for the variable to be entered into the regression equation, $r(27) = -.10$, $p = .61$ (two-tailed). This provides no evidence for high composite scores on the BACARQ being indicative of an ability to deviate the REG in the intended direction.

Hypothesis 4. The correlation of the composite score on the ESI with the difference between high and low intentions runs was $r(28) = -.07$, $p = .72$ (two-tailed). When running the stepwise linear regression, the variable was not entered into the equation. Therefore, a high cumulative score on the ESI was not indicative of an ability to deviate the REG in the intended direction.

Hypothesis 5. The correlation of the altered state scale on the second administration of the PCI with the difference between high and low intention runs was insufficiently significant for the variable to be entered into the regression equation, $r(27) = -.04$, $p = .85$ (two-tailed). This provides no evidence for the altered state scale being indicative of an ability to deviate the REG in the intended direction. However, a new binary variable was created denoting the direction of the deviation. A one denotes a positive difference between high and low intention runs, whereas a zero denotes a negative difference between high and low intention runs. That is to say, a one denotes a deviation in the intended direction and a zero denotes a deviation in the direction opposite to intention. There was a significant correlation between the altered state scale on the second administration of the PCI and a deviation in the intended direction, $r(27) = .40$, $p = .03$ (two-tailed). An independent samples *t*-test was conducted with the second altered state scale and

the new binary variable. Levene's test for equality of variances was significant and therefore equal variances were not assumed. When equality of variances was not assumed, the independent samples *t* test was not significant, with $t(10.92) = -1.89$, $p = .09$ (two-tailed). The mean of the second altered state scale for the intended direction was 7.33 ($SD = 6.04$) whereas the mean for direction opposite of intention was 3.20 ($SD = 3.78$). These additional analyses suggest that while there is some support that an altered state of consciousness while attempting to deviate the REG could be correlated with a deviation in the intended direction, the absence of a "dose effect" makes such correlation unlikely.

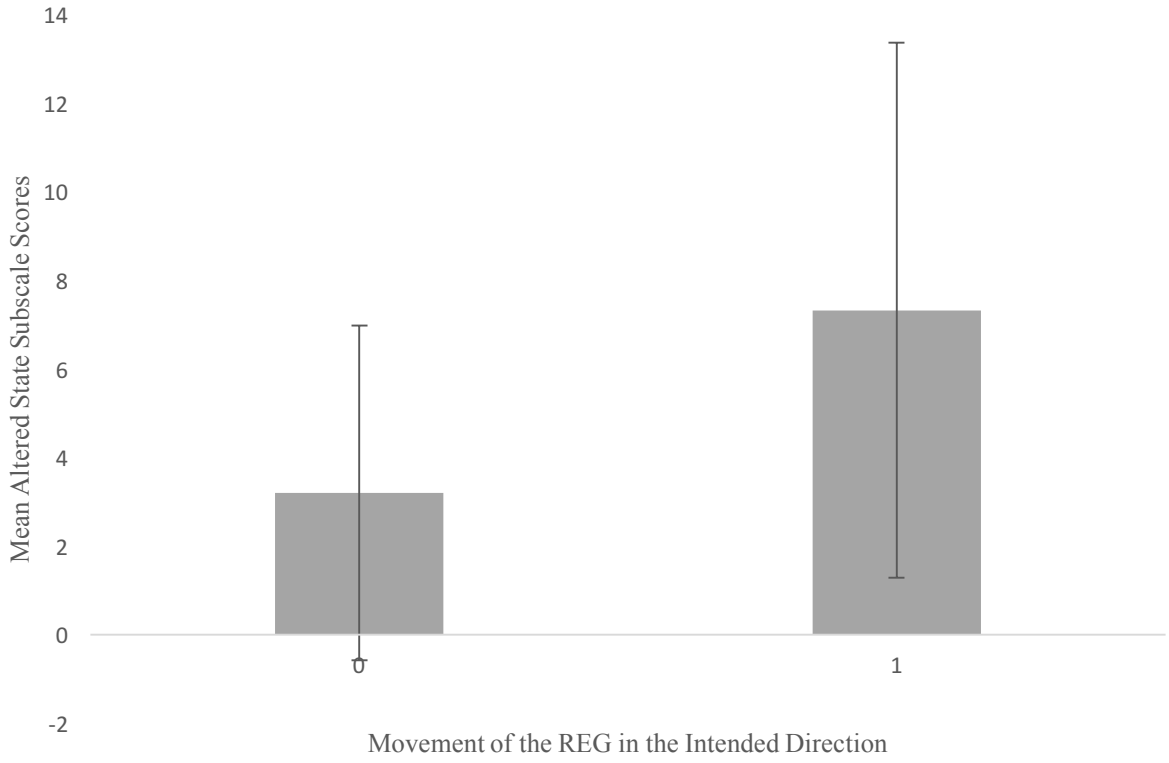

Figure 1. Mean altered state scale scores on the second administration on the PCI where one denotes the intended direction and zero denotes the direction opposite to intention. Error bars reflect the standard deviation for each condition.

Hypothesis 6. The correlation of the resonance score with the difference between high and low intentions runs was $r(28) = .11$, $p = .56$ (two-tailed). The variable was insufficiently significant to be entered into the regression equation. Therefore, those who identify with the REG or feel a transcendental unity with it are not more likely to deviate the REG in the intended direction. However, resonance was correlated with the love subscale on the second administration of the PCI, $r(28) = .65$, $p < .01$ (two-tailed), and the change in the love subscale from the first PCI administration to the second was correlated with the difference between high and low intention runs, $r(28) = .39$, $p = .04$ (two-tailed). An analysis of variance showed that the effect of the change in the love subscale was significant, $F(1,25) = 4.43$, $p = .05$, accounting for 15% of the variance in the difference between high and low intention runs. These additional analyses suggest that if love is associated with resonance, and a change in love is associated with the difference between high and low intention runs, then a correlation between resonance and the difference between high and low intention runs could be revealed if there were to be more statistical power.

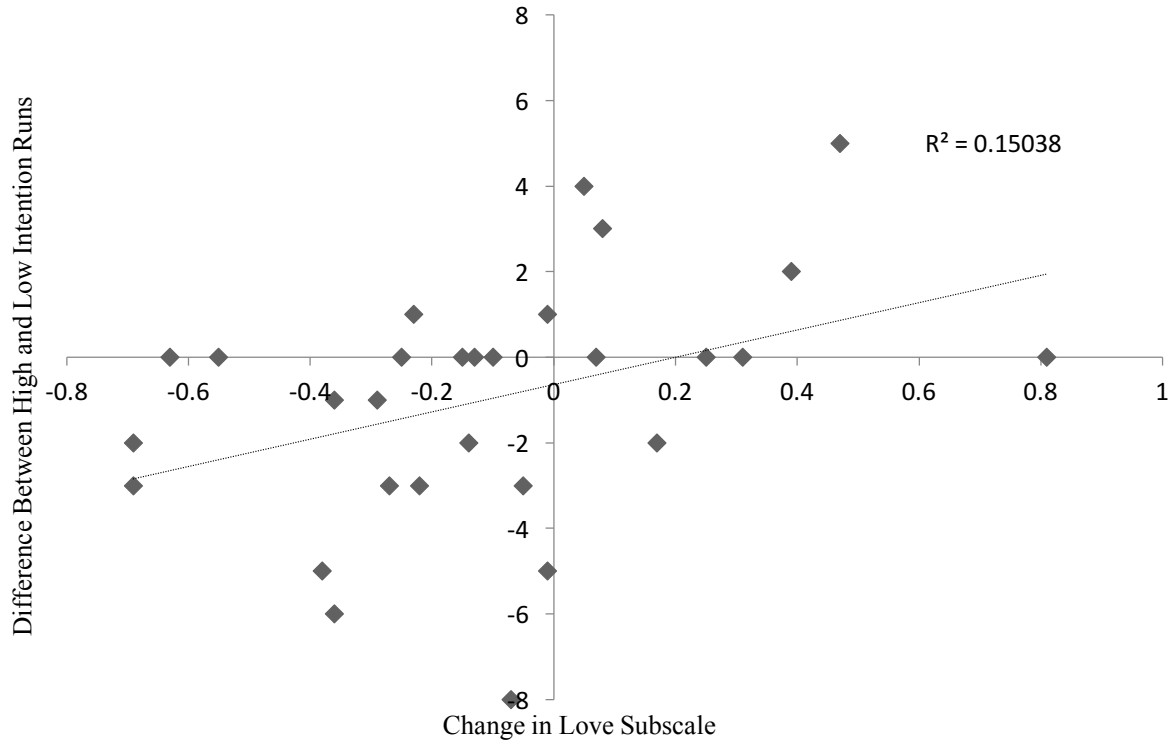

Figure 2. The relation between the difference between high and low intention runs and the change in the love subscale.

Hypothesis 7. The correlation of the belief score, accumulated prior to any interaction with the REG, with the difference between high and low intention runs was insufficiently significant for the variable to be entered into the regression equation, $r(28) = -.19$, $p = .31$ (two-tailed). Therefore, those who think they can alter the REG are not more likely to deviate it in the intended direction. A summary of hypotheses two to seven can be found in Table 1.

Table 1

Correlations, Significance and Sample Size of Predictor Variables with Difference Between High and Low Intention Runs

Predictor Variable	Pearson Correlation	Sig. (two-tailed)	N
FieldREG Average	.06	.75	30
BACARQ Composite Score	−.10	.61	29
ESI Composite Score	−.07	.72	30
Altered State Subscale Score	−.04	.85	29
Resonance Score	.11	.56	30
Belief Score	−.19	.31	30

Post Hoc Analyses

Post Hoc Analyses were conducted to obtain a better understanding of the gathered data. Significant correlations were found between the FieldREG and other variables. One way to validate such post hoc discoveries, although with considerable loss of statistical power, would be to randomly split the sample into two equal-sized samples, look for relationships on one half of the sample, and then check to see if they are replicated on the other half sample. Both education and the rationality scale from the PCI were statistically significant in the initial sample. Education lost its significance on each of the two random samples, and rationality held its significance in one of the two random samples, $r(13) = -.81$, $p < .01$ (two-tailed), but not in the other, $r(13) = .20$, $p = .47$ (two-tailed).

Discussion

Main Findings

None of the individual characteristics hypothesized were significantly correlated with an ability to deviate the REG in the intended direction. Furthermore, there was no evidence supporting an ability to deviate the REG in the intended direction.

Specific Findings

Hypothesis one was not supported in that there was no significant deviation in the intended direction. Hypothesis two was not supported in that trials without direct conscious intention did not predict trials with direct conscious intention. Furthermore, hypothesis three was not supported in that high composite scores on the BACARQ were not indicative of an ability to deviate the REG in the intended direction. Hypothesis four was not supported in that a high composite score on the ESI was not indicative of an ability to deviate the REG in the intended direction. Moreover, hypothesis five was not supported when the altered state subscale was

considered as a continuous variable, but it was supported when it was considered as a bivalent variable. There was a significant correlation between the altered state scale on the second administration of the PCI and a deviation in the intended direction, but if the degree to which the REG moved in the intended direction is taken into account, the hypothesis was not supported.

Hypothesis six was not supported as resonance scores were not indicative of an ability to deviate the REG in the intended direction. Though, resonance scores were significantly and positively associated with the love subscale and the change in the love subscale was significantly and positively correlated with the difference between high and low intention runs. This suggests that resonance might be secondary to love in the context of a direct human-machine interface. Finally, hypothesis seven was not supported as those who thought they could alter the functioning of the REG were not more likely to deviate it in the intended direction. Correlations between the FieldREG averages and education and FieldREG averages and rationality were also found prior to splitting the sample in half.

General Conclusions

The correlation between education and FieldREG averages should continue to be explored because if negative correlations continue to arise, this is indicative of a lower level of education being correlated with an ability to deviate the REG. It is possible that the more educated a person is, the more he or she has been exposed to a materialist bias in the education system. This could interfere with his or her ability to deviate the REG (Barušs & Mossbridge, 2016). Having in one's mind that consciousness is a property of brain function versus consciousness having non-local properties may act as a barrier to these capabilities.

In this same way, the negative correlation between rationality and the FieldREG may suggest that as rational activity increases, one's ability to deviate the REG decreases. In other

words, irrationality and perhaps emotion, may be implicated in the ability to deviate the REG in the intended direction. Dunne & Jahn (2005) noted the following:

> Most recent studies of consciousness have been limited to those domains of cognition, sensory perception, language, and other spheres where relatively well-understood relationships between these processes and their associate brain functions prevail. In so doing, the less tangible subjective aspects of experience, such as intuition, emotion or instinct, have tended to be neglected. (p. 704).

This goes to show that we may be overlooking the importance of emotion. As previously noted, anomalous effects with the FieldREG were found for venues demonstrating emotional engagement whereas null effects prevailed for venues where intellectual engagement was present.

Similarly, and as previously noted, it has been proposed that subjective aspects of consciousness are highly related to group resonance. Jahn (1996) described resonance as a "surrendering sense of identity [that merges] with the machine into a unified system, of exchanging roles with the machine, of 'falling in love' with it, or of having 'fun' with it" (p. 34). This particularly, may be why love is correlated with resonance and also with the difference between high and low intention runs. This love may assist the process of information transfer between one's consciousness and the REG (Jahn, 1996). Jahn (1996) highlighted a quote from Prince Louis de Broglie:

> If we wish to give philosophic expression to the profound connection between thought and action in all fields of human endeavor, particularly in science, we shall undoubtedly have to seek its sources in the unfathomable depths of the human soul. Perhaps philosophers might call it 'love' in a very general sense –that force which directs all of

> our actions, which is the source of all our delights and all our pursuits. Indissolubly linked with thought and with action, love is their common mainspring and, hence, their common bond. The engineers of the future have an essential part to play in cementing this bond. (p. 38).

This could extend to human-machine interfaces suggesting that love may be necessary for there to be any direct connection.

Limitations

Instead of using the Psyleron Classic REG as an electronic noise source for trials with intention, the PseudoREG or random number generator on the computer was used as a result of a programming error. The random number generator on the computer uses deterministic processes to produce its output which was fed into the Psyleron Classic REG software. Jahn et al. (1987) note that the PseudoREG and the Classic REG are identical in terms of the feedback and the software used. Either can also use the same experimental protocol. The results of 29 experimental series conducted by Jahn et al. (1987) using a PseudoREG demonstrated a clear ability of the operator to produce deviations against chance ($p = .00$). Nevertheless, it may be more difficult for participants to alter the functioning of deterministic pseudorandom processes versus the truly probabilistic processes produced by the Classic REG.

Another limitation of this study is the amount of statistical power. With an N size of 30, finding a small effect is made difficult. The correlation of rationality with deviations of the FieldREG was significant, but not on both subsamples when the sample was split in half. This is perhaps due to the fact that the subsamples are too small to detect an effect. It is also acknowledged that there will be some relationships that come out statistically significant by chance when testing multiple relationships. This was corrected for as much as possible, but there is no clear way of

compensating for all the different types of comparisons that were made. This is why the results should be replicated.

Correlations with the second administration of the PCI or changes from the first administration of the PCI could be the result of a priming effect caused by the participants' results of their interactions with the REG. For instance, if the REG moved in the intended direction, then someone might be in a more positive, 'loving,' mood, than someone for whom the REG did not move. A solution to this would be to remove the feedback for participants, so that they do not know how well they did.

Gender differences were not considered in the present study. Dunne (1998) indicates that the average results for males were significantly more correlated with their pre-stated intentions for high and low trials with a variety of random event generator devices, in comparison to females. Specifically, most males in the study had successful trials in both directions, but most females displayed the opposite of their intention for low intentions runs. The sample of women in the present study was larger than the sample of males, and this could be one reason why a significant deviation in the intended direction was not found. Additional post hoc statistical analyses were conducted but no evidence for this explanation was found.

It has also been shown that most people can't produce quantifiable direct mental effects on physical systems. Particularly, even if there was anyone in the study who could deviate the REG in the intended direction, they were unable to get a sufficient deviation to offset the random outcomes of the REG for anyone else (Barušs & Mossbridge, 2016).

Practical Implications

Gaining empirical evidence on the applications of such research generates greater interest in the study of consciousness and greater funding for further research; it may also dampen

skepticism if an overall effect is found. Outcomes with the FieldREG demonstrates a possible breakthrough in microelectronic technology in its ability to detect collective harmonies (Jahn & Dunne, 2005). Perhaps the random event generator can be used to detect the presence of interpersonal harmony and feelings of love. Moreover, Braud (2003) states that systems similar to the REG, that have large amounts of lability or are constantly undergoing change, may be ideal targets for direct mental influence. Successful cases of direct mental influence have already been seen in many biological systems such as microscopic organisms, plants, animals, and in the physiology of humans. Furthermore, Braud (2003) has looked at the direct mental influence of one human on another's mental processes, and specifically improvements in concentration. He found fewer distractions were experienced by subjects when helpers were mentally focusing their attention at a distance.

Future Research

The present study is novel due to the fact that there is no research on whether spirituality and beliefs about reality can predict an ability to influence these types of machines. Furthermore, the state of consciousness an individual may be in while interacting with the REG, as indicated by the PCI, has not been studied. Certain personality factors such as "one's ability to concentrate or become absorbed in what one is attending to, one's degree of introversion, and one's degree of social avoidance and distress" (Braud, 2003, p. xxxiv) have been found to be factors affecting direct mental influence on other individuals. It is also suspected that a belief in a positive outcome may improve the rate at which success occurs. These individual characteristics should continue to be explored in order to provide information about the study of consciousness and our human capabilities. One suggestion would be to see if some of the participants who had large positive results would be willing to return to the lab to generate larger databases.

It would be interesting to carry out an experimental design where there is a comparison group. Correspondingly, another student under the supervision of the co-investigator is using the same experimental design, but instead of allowing the participants to freely interact with the REG, the participants will be guided through a meditation and visual imagery exercise in an attempt to facilitate the interaction with the REG. The data acquisition is currently under way and the participants from the present study will be a control group for participants that will be partaking in this study. It will be fascinating to see if the same patterns arise, or if any differences will be found as a result of the meditation and visual imagery techniques.

There is also another study in the planning stages. Professor Imants Barušs in the Department of Psychology at King's University College and professor Akshya Vasudev in the Department of Psychiatry at Western University are planning on using the REG in the FieldREG mode as a before and after measure. They are planning on testing to see if there are changes in the resonance or love of psychiatric patients with treatment resistant depression in a clinical trial of meditation as treatment.

Final Conclusions

None of the present study's hypotheses were supported, but the parameters affecting the ability to deviate the REG in the intended direction should continue to be explored. In addition to supporting the existence of such a phenomenon, it is important to understand the nature of it and under what conditions it is most likely to occur. It would be helpful to identify the individuals who can alter the functioning of REG and to examine their emotions, beliefs, spirituality and state of consciousness.

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Appendix A

Demographics and Attitudes Form

Name: _____ **Age:** _____

Gender: ☐ Female ☐ Male

Highest level of education:

☐ High School Graduate ☐ College Graduate ☐ Post-graduate Degree ☐ None of these

Religious Affiliation:

☐ Buddhist ☐ Judaic ☐ Christian ☐ Muslim ☐ Own Beliefs ☐ None

☐ Other (Please specify): _____

Frequency of religious practice:

☐ Daily ☐ Weekly ☐ Monthly ☐ Hardly Ever ☐ Never

Attitude toward REG:

Please rate your agreement with the following statement:

I think that I can alter the functioning of the REG.

☐ definitely not ☐ likely not ☐ don't know ☐ likely yes ☐ definitely yes

Appendix B

Questions About the Experience with the Random Event Generator

1. Please describe your experience with the random event generator (REG).

Attitude toward REG:

Please rate your agreement with the following statements:

2. I think that I was able to alter the functioning of the REG.

☐ definitely not ☐ likely not ☐ don't know ☐ likely yes ☐ definitely yes

3. I felt that I was one with the REG:

☐ definitely not ☐ likely not ☐ don't know ☐ likely yes ☐ definitely yes