Testing parapsychology's "intentionality hypothesis": the effects of distant mental intention on bacterial growth

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Abstract

Since the 1960s a consistent body of mind-matter interaction research in parapsychology has coalesced around the "intentionality hypothesis", the claim that mental intention can affect nonliving or living systems at a distance. This experiment explored the hypothesis in a biological laboratory setting using a strain of bacteria, LV13, found in lactic acid. After directing positive and negative intentions towards samples, researchers measured bacterial density using absorbance of the cultures, hypothesizing significant increase and decrease in growth corresponding to each condition respectively compared to a control condition. As predicted, results showed statistically significant increase in growth in the positive condition; contrary to our hypothesis, the negative condition also showed statistically significant increase in growth. This experiment further supports the claim that distant mental intention can affect growth in microorganisms while suggesting refinement of studies through a distinction within mental intention between "energetic" and "evaluative" components.

Keywords: distant mental intention, mind-matter interaction, microbial growth

Introduction

- "Parapsychology is the scientific study of experiences which, if they are as they seem to be, are in principle outside the realm of human capabilities as presently conceived by conventional scientists." (Irwin, 1999)
- Intentionality refers to "the projection of awareness, either positive or negative, with purpose and efficacy, toward some object or outcome" (Schlitz, 1995, pp.5-6)
- Mainstream research psychologists have often rejected evidence of the effect of "distant mental intentionality on living systems" (DMILS) despite consistent findings since the 1960s (Braud, 2003; Radin & Nelson, 2013)
- Radin, Taft & Yount (2004) discovered during their experimentation with cultured cells, differences between samples may be weak, but also have cumulative effects
- Lai, Yuen, & Burchett (2018) found that mental intentionality significantly impacted growth in microorganisms in rice, and of *e. coli*, both positively and negatively

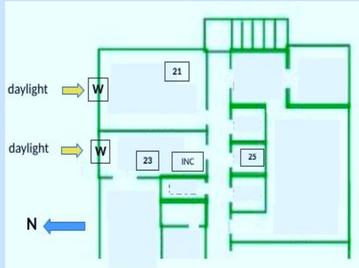

Figure 1: **Laboratory Floor Plan**

Day 1			
Intervention time	Location (-)	Location (+)	Location (c)
2:00-2:20 PM	21 (JT)	23 (RL)	25
3:00-3:20 PM	23 (RL)	25 (JT)	21
4:00-4:20 PM	25 (JT)	21 (RL)	23
Day 2			
Intervention time	Location (-)	Location (+)	Location (c)
2:00-2:20 PM	21 (RL)	23 (JT)	25
3:00-3:20 PM	23 (JT)	25 (RL)	21
4:00-4:20 PM	25 (RL)	21 (JT)	23

21 Placement location & temperature (°C)
INC Incubator (25°C)
W Window

Figure 2: **Intervention Table**

Methodology and Procedure

Bacteria was grown from a single culture and divided into three wellplates (88 wells @ plate) kept in an incubator. Each was assigned to a positive intention, a negative intention, and a control condition (no intention). The supervisor (CP) was not present; an experimenter (LMV) who was blind to the study oversaw the biological preparations and measurements; RL and JT acted as the influencers performing the intentions. Three 20 minute interventions were undertaken for each experimental condition; growth was then measured. This procedure was repeated the following day and results compiled.

- The agent Carnobacterium divergens [LV13] was used in this experiment with all three conditions
- Using living systems for distant mental intention affords precise monitoring of physiological effects (growth) through scientific measuring devices (Braud, 2003); bacterial growth was measured through absorbance of the cultures (measured at 600 nm)
- 528 samples derived from the same culture base were assigned to three conditions (positive and negative intention, and control) with 176 in each condition divided among two days (Wednesday and Thursday) with 88 samples in each condition for each day (significance was set at $p<0.05$)
- Each condition was taken from the incubator and rotated through the three different placement locations (temperatures varied between locations between 21°C-25°C) for each intervention (see Figure 1)
- Each experimental condition received three mental intention interventions, equally balancing negative and positive intention conditions between the two influencers, while the control received none (see Figure 2)
- A first check to assess whether sufficient growth had occurred since plating to warrant measuring was negative; a second test followed which was positive and was used to measure absorbance (Figure 3)
- The timing of the three interventions, the check, and the test, can be visualized against the three growth phases of a time vs. approximate bacterial growth graph to help conceptualize the experiment (Figure 4)

Tests	Samples	Wednesday	Thursday
Culture plated		12:40	12:20
Check	Negative	6:16pm - 6:17pm	6:24pm - 6:25pm
	Positive	6:17pm - 6:19pm	6:19pm - 6:21pm
	Control	6:14pm - 6:15pm	6:22pm - 6:23pm
Test	Negative	6:50pm - 6:52pm	6:50pm - 6:52pm
	Positive	6:49pm - 6:50pm	6:52pm - 6:54pm
	Control	6:52pm - 6:54pm	6:48pm - 6:50pm

Figure 3: **Timetable**

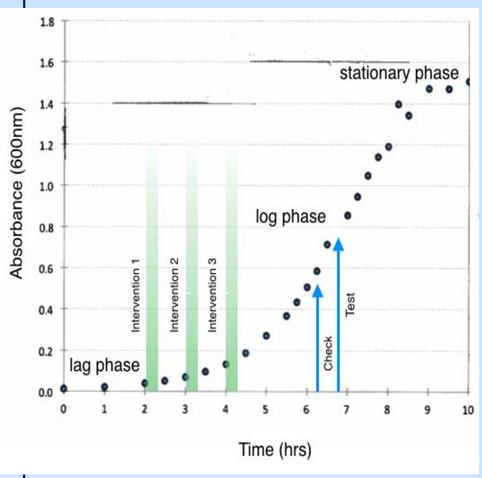

Figure 4: **Growth Curve**

Potential confound	Confounding effect	Ways it was controlled
Intentional confounds		
Intentional content	"Intention" is vague; could have thought different, incomparable, vague, or confused intentions	Operationalized intention by influencers following scripts with a set number of fixed prompts
Influencer "proficiency"	One influencer more "proficient" than the other	Positive & negative intention conditions divided equally between influencers (see figure 2)
Other people	Presence of other people passing by different locations	Conducted during a conference when labs were not in use
Experimenter	Knowledge of study biases outcomes	Experimenter blind to purpose of study
Supervisor	Knowledge of study biases outcomes	Supervisor not present
Physical confounds		
Sample source	Samples derived from different sources might show differential growth rates	All samples derived from same source
Handling/ contamination	Heat or touch or disturbance from influencers	All trays were carried in identical way, all minimizing impact by "finger-carrying"
Incubator	Different incubator conditions	All trays within same incubator between interventions
Location	Difference in location effects between the three locations to which trays were brought, e.g. light or air quality or room temperature	Rotated trays equally through the three locations (see figure 1)
Temperature	Different temperatures, due to e.g. room fluctuations, or influencer body heat in proximity to tray	Thermostat beside each tray; temperature measured at beginning and end of interventions*[1]
Experimenter	Knowledge of study biases handling,	Experimenter blind to purpose of study
Intervention sequence	Sequence of placing of trays to different conditions	Identical sequence followed to keep each condition equal (see figure 2)*[2]
Intervention time	Different times, differential growth	All interventions: 20 minutes
Measuring time	Time it took to measure growth for test	Timer used and measurements undertaken within 1-2 minutes
Placement timing	Time it took placing trays in different locations & replacing into incubator	Timer used and all placements undertaken within 1 minute
"Day effect"	Particular day (Day 1 or Day 2) accounted for the effect	Statistical test of Day 1 and Day 2 means showed no differential effect
Label size	Size of tape used to label trays (blocking light?)	Not systematically controlled; but approximately equal tape sizes used for labels (maximum difference of a few centimeters)

*[1] A significant body heat effect of each influencer was not taken into consideration. Therefore, a potential confound of "body heat" might account for the significant difference finding.

*[2] Non - random sequencing may have introduced a "time x temperature" confound as the temperatures in each room differed (see figure 2). Bacterial growth is time sensitive, therefore the placement of each sample might have had an effect on growth potential (see figure 4).

Figure 6: **Confound Chart**

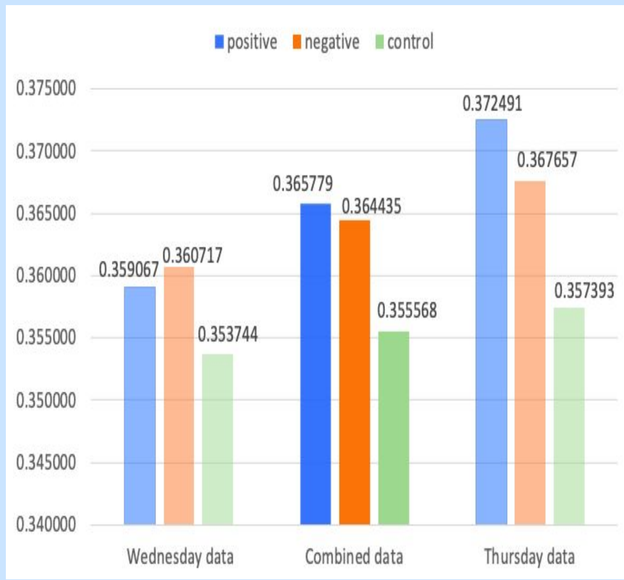

Figure 5: **Sample Means**

Results

An analysis of variance (ANOVA) was performed on the data collected to determine the statistical significance. The null hypothesis stated that there would be no significant difference between samples. There was a significant difference in growth between samples, as both comparisons to the control proved to be significant. Researchers were able to reject the null hypothesis ($SD=.82$; $Df=2$; $F=42.14$; $p<0.05$). This effect was independent of time, location and incubation. This confirmed the prediction of an increased growth for the positive condition. The prediction of an inhibition of growth in the negative condition was not confirmed, but found instead statistically significant increased growth (as with the positive condition).

Discussion

This experiment replicated the claims of the distant mental intentionality literature, showing statistically significant differences in growth and thus confirming the "intentionality hypothesis". Potential confounds in this experiment were rigorously considered (see Figure 6). In our perception, parapsychology needs to place greater emphasis on identifying and ruling out potential confounds in future replications. Contrary to our hypothesis, and contrary to the claim of Lai, Yuen, & Burchett (2018), the negative intentionality group did not show significantly less growth by comparison to the control but showed significantly increased growth comparable to the positive intentionality condition. This finding suggests a refinement within the distant mental intentionality studies: that the effects of the "energy" of conscious intention are separable from the human "evaluation" of growth as positive or negative.

Parapsychology studies that conflate the "energy" component of intentionality with the human "evaluative" component of intentionality therefore introduce a basic ambiguity into the concept of intentionality that impairs our ability to accurately interpret findings. Overinterpretation is a problem. This experiment points to the feasibility of exploring a wide range of mind-matter interaction studies using carefully controlled experimental research to assess the viability of distant mental intentionality.

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