

The neural correlate of ignorance: an fMRI study

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INTRODUCTION

In 1796, Gall described the cerebral organs that he believed were responsible for certain character traits. Since then we have acquired detailed knowledge of the parts of the brain engaged in many cognitive functions through neural imaging studies.

But so far no one has attempted to locate the cortical seat of ignorance. Ignorance is arguably the most pervasive mental attribute, and the one that makes us truly human. Unfortunately it is difficult to measure using common imaging techniques, since the sophisticated machinery tends to saturate the ignorance system even before any stimuli are presented. Here, I use **functional mechanic resonance imaging**, a technique developed specifically for this study, to locate the seat of ignorance in the human cortex. But what evidence is there for a well defined neural ignorance system at all?

“GENERAL IGNORANCE”, OBJECTIVELY DETERMINED AND MEASURED

While comparing the scores of random Joe Shmoes on a set of personality measures I had devised over the last few hours, I noticed strong positive correlations between some of them. I discarded the non-correlated ones and came up with Table 1.

Experts tell me that the positive correlations of these measures must mean that there is some underlying general principle behind them, effected by some physical body. Since I do not like the behaviors expressed by high scores on the measures listed in Table 1, I call this underlying general principle GENERAL IGNORANCE (GI), not be confused with other neurologically interesting generals, such as Patton, MacArthur or Rommel. General Ignorance has nothing in common with these gentlemen.

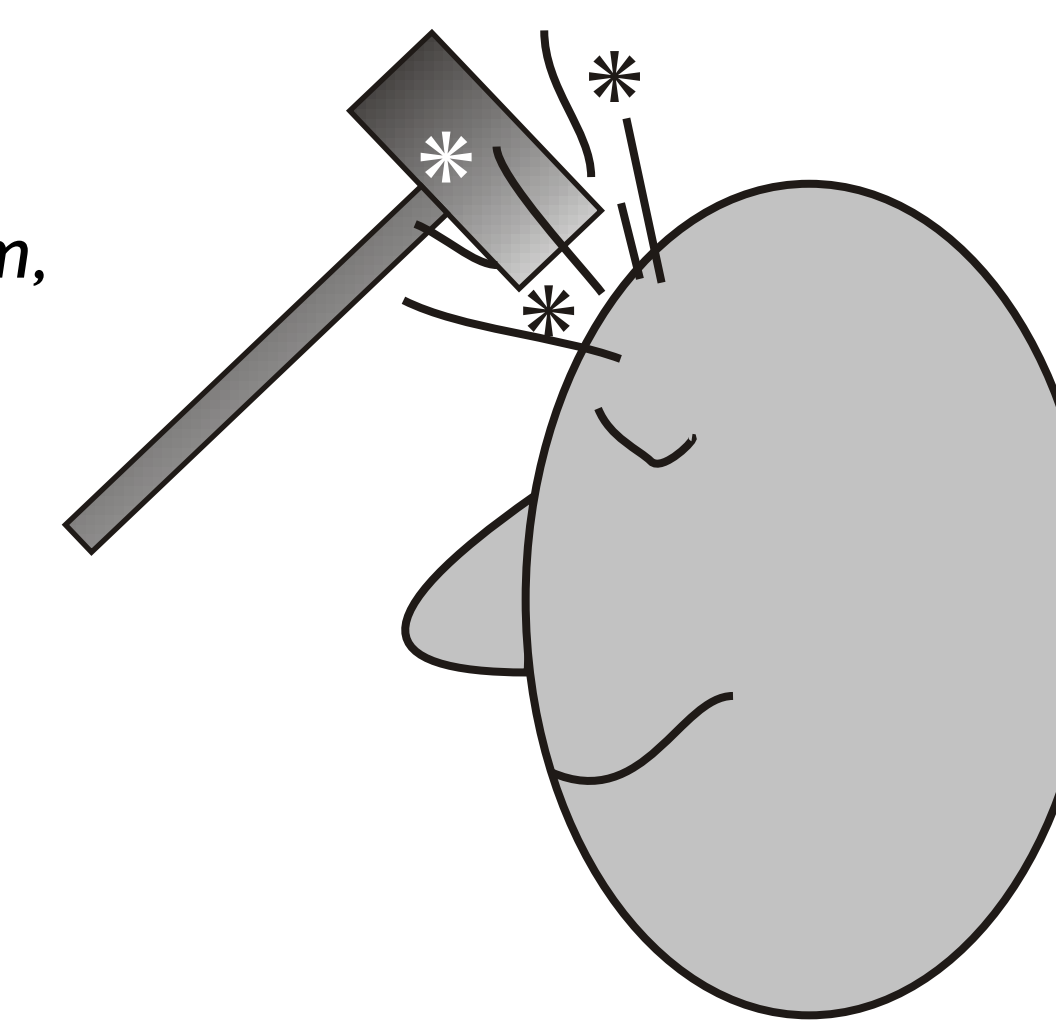
	CRAP	SICC	U-LOON	BULL	FOOL	IDIAT-Q
Cinema Random Activity Profile (CRAP)	1.0	0.86	0.76	0.82	0.74	0.68
Shouting into Cellphone while Commuting (SICC)	0.86	1.0	0.88	0.85	0.66	0.70
Using “Like” or Other Noises (U-LOON)	0.76	0.88	1.0	0.72	0.66	0.87
Bellowing Use of Laughter Likert Scale (BULL)	0.82	0.85	0.72	1.0	0.91	0.81
Flouting of Other Lifestyles (FOOL)	0.74	0.66	0.66	0.91	1.0	0.60
“I did it always thus”-Quotient (IDIAT-Q)	0.68	0.70	0.87	0.81	0.60	1.0

fMRI on the Go - Try it Yourself!

The great advantage of the fMRI method as described in the main text is its flexibility. It could even be used at the bedside with clinical patients. To elicit an fMRI signal from yourself, read the following lines out loud while hitting yourself on the forehead with the open palm. If you feel dizziness or anger, you have successfully stimulated your ignorance circuits. Congratulations.

*This double worship,
Where one part does disdain with cause, the other
Insult without all reason, where gentry, title, wisdom,
Cannot conclude but by the yea and no
Of general ignorance,--it must omit
Real necessities, and give way the while
To unstable slightness: purpose so barr'd,
it follows, Nothing is done to purpose.*

William Shakespeare, Coriolanus



FUNCTIONAL MECHANIC RESONANCE IMAGING

To overcome the aforementioned problems in imaging ignorance, I employed the following strategy. First, the subject was seated with a friend in the university cafeteria. During that first stage the conversation of the subject was recorded from a neighboring table using an HB pencil and letter sized blank paper (80g/m²). The subject then was brought into the experimental room.

For the fMRI experiment, the subject was seated comfortably and either her original conversation (baseline) or lines from a Shakespeare play (signal) were read to her. It can be assumed that the subject was non-ignorant regarding her own previous utterances, whereas the Shakespeare quote had a high probability of eliciting an ignorance signal. This was confirmed by the subject’s self-report.

While the subject was listening, her head was mechanically stimulated with short pulses delivered using a reflex hammer. The locus of stimulation on the skull was varied systematically between trials. The subject’s response (verbal, body movement, threats) to each of these pulses was recorded quantitatively on a scale ranging from one to ten. A stronger response in the signal condition indicates a greater excitability of the ignorance system at this skull location. Figure 1 shows the typical result from the subject.

RESULTS

Figure 1 clearly shows that during perception of stimuli selective for the ignorance system, ignorance was most strongly enhanced by mechanical resonance stimulation over the frontal cortex. Therefore I conclude that the frontal lobe is the seat of general ignorance.

It is interesting to compare GI across groups. Since the ignorance system is located in the tissue of the frontal lobe, its design must be specified in the genome. This could help explain certain phenomena of decision making in politics and economy, which are a mystery otherwise. I have made up preliminary evidence, showing that bureaucrats are relatively more ignorant than Buddhist monks are. If this result will hold, we would have to drop all efforts to educate bureaucrats, since the effort is futile. We should concentrate on Buddhism instead.

fMRI has proven to be a powerful new experimental technique, allowing the visualization of human cortical processing in vivo. While its temporal and spatial resolution both appear improvable, the simplicity and affordability of the equipment are clear advantages.



Figure 1: Activation of cortical areas due to mechanic stimulation of the skull. This image was created by overlaying two-dimensional gaussian patches centered on the locus of stimulation. The amplitude of the gaussians reflects the difference in strength of response between the signal and the baseline condition in each location.