

# Review of: "Neural Quantum Superposition and the Change of Mind"

Giancarlo Cavicchio<sup>1</sup>

<sup>1</sup> University of Aquila

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The author has introduced the concept of "uncertainty" as a specific state of mind, where two thoughts A and B are somehow linked intrinsically, shown as an interaction term  $\Psi(A)\Psi(B)$ . The model presented requires three terms to depict a general state of awareness, when a choice between two options has to be made:  $\Psi(A) + \Psi(B) + \Psi(A)\Psi(B)$ .

This form is identical to the one describing the famous two-slit experiment, where a mysterious interference of an electron with itself occurs, and is expressed by a similar interaction term. The use of a reversible time evolution operator seems to model the possibility of a "change of mind", by redefining the magnitude of the probabilities  $\alpha^2$  and  $\beta^2$  passing through a never-vanishing state  $\gamma$  of uncertainty. It is interesting, as I am a chemist, to see that a specific neurochemical state, a "constellation S3", is postulated, which would be very interesting indeed to detect experimentally, and which is thought to be different from the chemical constellations of the single thoughts. Also important in this NQS model is the comparison of the  $\gamma$  interaction term with the "overlap integral", which

is responsible for the existence of a covalent chemical bond in molecules. The mathematical expressions are identical. Now, Marsili has brought together three totally different systems, that have apparently nothing in common, the double slit experiment, the dynamic system of two thoughts in the mind, and the creation of a chemical bond from two electrons. All of these systems are modeled by one and the same formal structure,

$\alpha^2 A^2 + \beta^2 B^2 + \gamma AB$ , which seems to root in quadratic form. Interesting.

The effect of small perturbations as "symmetry breakers" of the total state of uncertainty ( $\gamma=1$ ) is neatly modeled.

The paper is well written, the math is explained step-by-step and is palatable even for non-professional theoreticians. The hint towards the existence of a consciousness field is intriguing. This paper may be a source for further investigation, especially in the field of neurochemistry and behavioural sciences.