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Preliminary test of electron spin and muscle resistance

In a previous theoretical work, based on quantum field theory by Verzegnassi, Germano & Kurian, 2018, it has been shown that the energetic effect of a magnetic field on a system of free electrons depends linearly on the product of the polarity of the field with an intrinsic helicity spin property of the electron. We tested this through measuring the effect of different magnet polarities upon muscle resistance to force. Thirty-nine participants were requested to resist a downward force applied to their outstretched dominant arm, via a device designed to eliminate direct contact with the participant and to assess the specific force required to move participants' arms downward past a pre-determined point. The experimenter first measured the resistance without any magnetic charge, then placed a magnet of either positive or negative polarity (determined randomly) on the deltoid muscle and re-applied the force upon the arm. Then the experimenter reversed the magnet and reapplied the force for a third time. The duration and peak force were measured. The results showed a significant quadratic effect compared to baseline, a positive charge showed a significant increase in force required to move the arm, whereas a negative charge showed a significant decrease in force required to move the arm. Reversing the polarity reversed the force required, but not significantly. These results suggest that there might exist a property of the muscles, analogous to that of free electrons, of absorbing from a magnetic field an energy of a sign fixed by the polarity of the field and possibly by an extra intrinsic spin dependent property of the muscles. If this assumption was correct, one would conclude that this intrinsic spin dependent property of the 39 participants should be the same. Our next experiment will investigate this assumption.

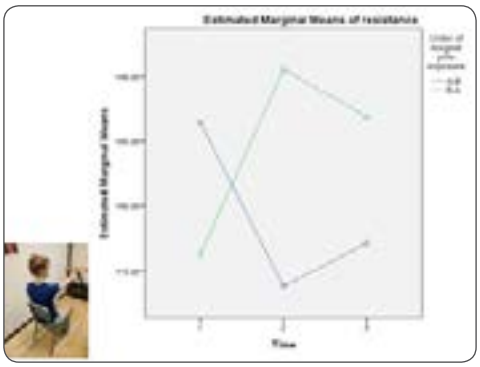

Figure 1: Force (in Newton's) required to move dominant arm past a predetermined point, by polarity

Biography

Mark G. Frank is a Professor and Chair of the Communication Department at the University at Buffalo, State University of New York who works in Nonverbal Communication

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