BRIEF REPORT

Human Subject Effects on Torsion Pendulum Oscillations: Further Evidence of Mediation by Convection Currents

Richard Hammerschlag, PhD[1,2,#] Ann Linda Baldwin, PhD[3,4] and Gary E. Schwartz, PhD[4,5]

Context: When a human subject sits beneath a wire mesh, hemispheric torsion pendulum (TP) a rapid-onset series of oscillations at frequencies both higher and lower than the fundamental frequency of the TP have been consistently observed.

Objective: This study was designed to replicate and extend prior findings that suggest the human subject effect on TP behavior is due to subject-generated, heat-induced convection currents.

Design: Effects on pendulum behavior were tested after draping an aluminized "space blanket" over the subject and by replacing the subject with a thermal mattress pad shaped to approximate the human form.

Setting: Experiments were performed in a basic science university research laboratory.

Main Outcome Measures: Real-time recordings and Fast Fourier Transform frequency spectra of pendulum oscillatory movement.

Results: The space blanket blocked, while the mattress pad mimicked, the human subject induced complex array of pendulum oscillations.

Conclusions: Our findings support and strengthen previous results that suggest the effects of human subjects on behavior of a torsion pendulum are mediated by body-heat-induced air convection rather than an unknown type of biofield.

Key words: Biofield, Convection, Torsion pendulum

(Explore 2016; ▮:▮▮▮-▮▮▮ © 2016 Elsevier Inc. All rights reserved.)

INTRODUCTION

The torsion pendulum (TP) is a device capable of rotational (twisting) oscillation, with independent amplitude and frequency parameters similar to those of a classical swinging pendulum. Various forms of a TP have long been used for measurement of weak forces, most notably Coulomb's studies of the electrostatic force between charged particles and the Cavendish experiments on gravitational force between two masses.[1] More recently, such twisting pendulums have been reported to detect electrical disturbances associated with geophysical events.[2,3]

TPs of several configurations (pyramidal,[3] hemispheric [4–6]) have also been constructed to test for effects of human subjects on pendulum behavior. In control studies, with no subject present, the initiation of hemispheric pendulum rotation by a puff of air (or a gentle manual torque) results in oscillations that trace out a damped sine wave with a single frequency, as with a classical pendulum. In contrast, when a human subject sits beneath the hemisphere with head partially within the dome, a rapid-onset series of oscillations —at new frequencies both higher and lower than the natural frequency of the TP—are consistently observed.[4–6]

Several approaches have been designed to identify the means by which human subjects induce the anomalous TP behavior. Grounding the subject as well as the TP did not suppress results, suggesting that static electricity is not a causative factor.[5] Altered air currents, produced via the subject's breathing, movement, or emitted body heat, have also been examined as potential mediators of human/pendulum interactions. Subjects instructed to minimize breathing and movement affected the TP in a manner similar to the initial findings.[5] Further, when a covered electric cooking pot was placed under the TP in a position comparable to that of a human subject's head and warmed to body temperature,[4,5] effects on pendulum behavior were described as "negligible."[4] In a further test of the subject-generated convection currents hypothesis, placement of a thick plastic shield between subject and pendulum essentially eliminated the novel oscillations.[6]

1 The Institute for Integrative Health, Baltimore, MD
2 Consciousness and Healing Initiative, San Diego, CA
3 Department of Physiology, College of Medicine, University of Arizona, Tucson, AZ
4 Laboratory for the Advances in Consciousness & Health, Department of Psychology, University of Arizona, Tucson, AZ
5 Arizona Center for Integrative Medicine, Department of Medicine, University of Arizona College of Medicine, Tucson, AZ

Corresponding author at: The Institute for Integrative Health, Baltimore, MD.
e-mail: rhammerschlag@ocom.edu

ISSN 1550-8307/$36.00

http://dx.doi.org/10.1016/j.explore.2016.08.003

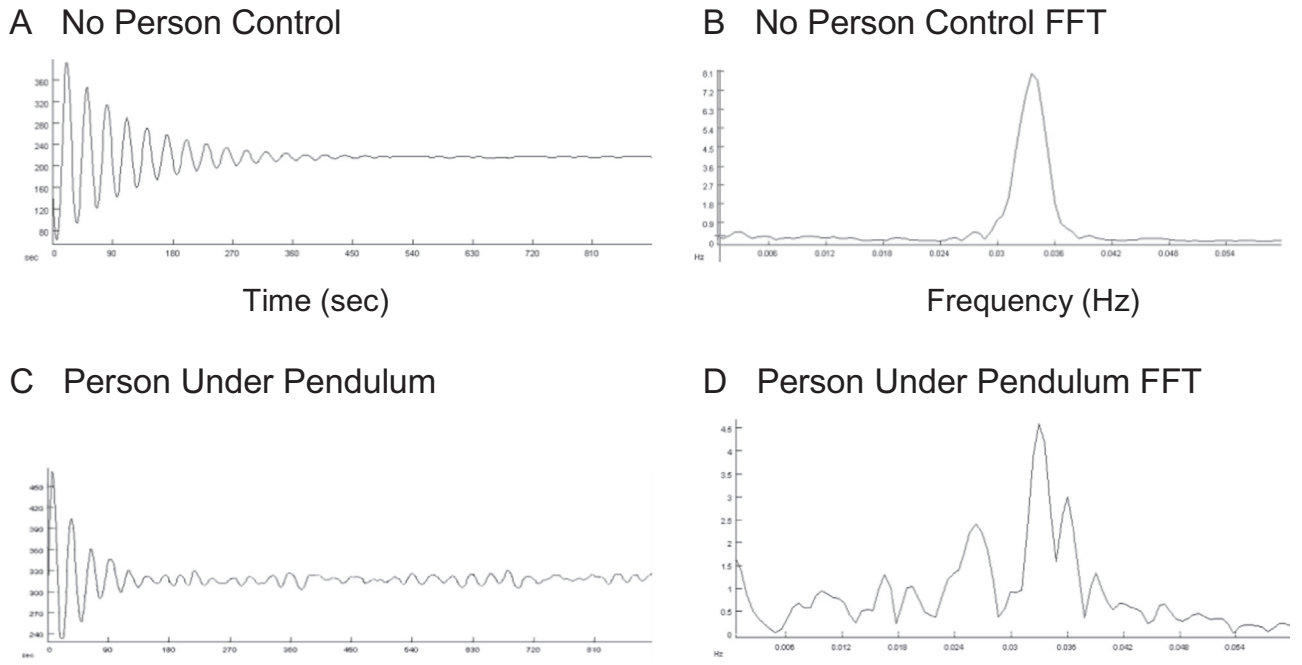

Figure 1. Torsion pendulum behavior in the absence (A and B) and presence (C and D) of a human subject. Time and frequency domains are shown in (A) & (C) and (B) & (D), respectively. Amplitudes are in arbitrary units in both cases.

In light of initial speculations that the observed effects of human subjects on the TP may represent a new fundamental "force" in physics,[5] attempts to rule out explanations based on classical physics are of fundamental importance. Accordingly, our experiments extend previous studies described above: we not only wrap an aluminized "space blanket" around the subject's head and body to shield the pendulum from the subject's body heat, we also replace the human subject with an electric mattress pad shaped to approximate the form of the subject beneath the pendulum. In this way, we have examined further the question of whether the human-subject-induced perturbations of pendulum oscillation are a consequence of radiating body heat or a human bioenergy field.

METHODS

The basic apparatus and experimental design, including the plastic mesh hemispheric dome suspended by a monofilament nylon line, the dome's tracking spot, video camera, and data collection software, followed closely on the original setup of Hansen and Lieberman,[4,5] as replicated by van den Berg and van der Sluys[6] (Figure 3A). Our two significant variations were placement of the computer and researcher in a room separate from the site of the pendulum and subject, and placement of the seated subject approximately 18″ below the lip of the hemisphere. The separate rooms prevented possible biofeedback for the subject, and possible heat and/or electromagnetic effects from either the researcher (computer operator) or the computer itself. The vertical spacing between the subject's head and the hemisphere was introduced to facilitate subjects' entry and exit from beneath the pendulum. Preliminary runs with the 18″ gap showed little difference in effects on pendulum behavior from those when subject's head was partially within the dome. Data were collected for 15 min in every experimental session.

Aluminized polyester "space blankets" (1.3 m × 2.1 m, Coghlan's Emergency Blanket) were obtained from Coghlan's Ltd, Winnepeg, Canada. Polyester heated mattress pad (UBF-T

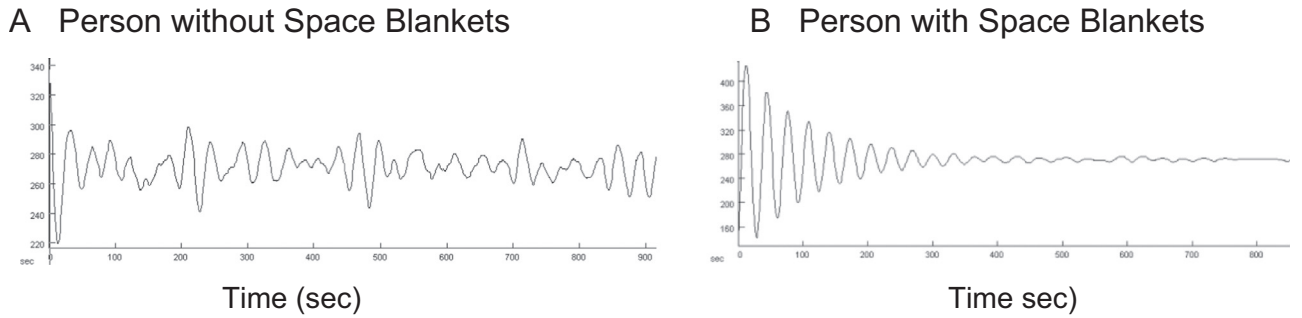

Figure 2. Torsion pendulum behavior in time domain before (A) and after (B) draping human subject with two space blankets.