

## MEASURES OF PAIN AND MUSCULAR STRENGTH IN TRANCE

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### Grant 344/20

**Background:** Trance is a non-ordinary state of consciousness characterised by a modified awareness of self and environment, and altered somatosensory processing. People who practice self-induced cognitive trance, a westernized practice of trance, anecdotally report decreased pain perception and increased muscular strength during trance.

**Aim:** To prospectively evaluate (1) pain perception and (2) muscular strength in a group of participants practicing self-induced cognitive trance.

**Method:** (1) Painful stimulations were administered in 3 conditions: ordinary consciousness (OC), trance and post-trance. Each condition included 10 min of electrical stimulations during which 60 stimuli were administered with a digitimer, followed by 3 pressures stimulations on the hand with an algometer. Pain intensity, pain unpleasantness and irritability were reported after each condition on a 0-10 scale. Event-related potentials (ERP) were also recorded.

(2) Muscular strength was assessed during OC, trance and post-trance. For each condition, 3 consecutive maximal voluntary isometric contractions were performed for 5 sec, 30 sec apart from dominant leg and arm using dynamometers. For each condition and muscle group, participants were asked to rate the subjective perception of their strength on a 0-10 scale and the perceived exertion with the Borg Rating of Perceived Exertion scale. Statistics were performed using repeated measures ANOVA and results were considered significant at  $p < .05$ .

**Results:** (1) 28 participants were included (44±14yo, 22 women, mean of practice 38±45months). Trance was associated with a significant decrease in pain intensity, unpleasantness and irritability compared to OC. Pain intensity and unpleasantness remained lower in post-trance compared to OC. The applied pressure was higher in trance than in OC and post-trance, with no difference between OC and post-trance. Decreased ERP amplitudes were also observed in trance compared to OC.

(2) 27 participants were included (45±18yo, 20 women, mean of practice 32±44months). Muscular strength increased in trance for both arm and leg as assessed with the objective and subjective recordings, compared to OC and post-trance. The perceived exertions decreased during trance compared to the other two conditions.

**Conclusions:** These results suggest that trance reduces pain and increases muscular strength. These findings may be extended to clinical applications, such as for patients with pain and motor impairments.

**Keywords:** Trance, Pain perception, Muscular strength, Subjective experience, EEG

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