

# Mood changes in response to electroacupuncture treatment in a classroom situation.

## Personality type, emotional intelligence and prior acupuncture experience, with an exploration of Shannon entropy, response style and graphology variables



### Background

Mood changes are often an important effect of acupuncture. We have used multiple rating scales to assess moods in our research since 2011. Here we again present the results of using a multiple numerical scale for mood, the NRS-M, before and after electroacupuncture (EA) delivered by and to students in a classroom situation. With a variety of innovative secondary measures, we explore how the NRS-M was scored, and also whether Jungian (Myers-Briggs) personality type, emotional intelligence and the helpfulness of prior acupuncture impacted on NRS-M scores and changes.

### Main objectives

- To pilot primary measures of Jungian personality type, emotional intelligence (EI) and the helpfulness of prior acupuncture in an electroacupuncture teaching situation.
- To develop secondary measures\* to describe how the NRS-M and EI scales are completed.
- To provide descriptive statistics for these primary and secondary measures.
- To investigate interactions between the primary and secondary measures.
- To draw conclusions from the resulting thicket of findings.

### Methods

- 88 respondents were recruited during six EA teaching sessions in the UK, attended as part of the requirement for a University degree qualification in acupuncture practice. The teaching sessions, at three different colleges (CICM, LSBU, NCA) all followed a similar standard pattern, and respondents were not obliged to complete the scales.
- Ethics approval was granted under applications for related studies by the University of Hertfordshire, UK. Permission was also received from the course organisers and respondents themselves.
- Statistical analysis (non-parametric) was conducted in Excel and SPSS.
- Further information on the questionnaires and secondary measures used, together with their analysis, is provided online at <http://www.qeeg.co.uk/electroacupuncture/moodchange>.

\* e.g. **Shannon entropy**, a measure of the inherent uncertainty or randomness of information in a given string of data.

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**Sample:** Percentage proportions of Jungian personality subtypes on courses at three different colleges: Are acupuncture students all Intuitive/Feeling types, and where do the Introverts hang out?

#	Jungian (M-B) subtypes	Norms (U.S.)	ALL (N=88)	CICM (N=37)	LSBU (N=25)	NCA (N=26)
I	Introverted (I) %	40	55.4	53.3	50.0	<b>60.9</b>
In	Intuitive (In) %	29	<b>67.7</b>	<b>70.0</b>	<b>75.0</b>	<b>60.9</b>
F	Feeling (F) %	50	<b>80.0</b>	<b>66.7</b>	<b>83.3</b>	<b>95.7</b>
P	Perceiving (P) %	44	47.7	46.7	41.7	52.2
E	Extraverted (E) %	60	44.6	46.7	50.0	<b>39.1</b>
S	Sensing (S) %	71	<b>32.3</b>	<b>30.0</b>	<b>25.0</b>	<b>39.1</b>
T	Thinking (T) %	50	<b>20.0</b>	<b>33.3</b>	<b>16.7</b>	<b>4.3</b>
J	Judging (J) %	56	52.3	53.3	58.3	47.8

**Bold** type indicates significant I/E, In/S, F/T and P/J ratios, using the Binomial test (I+E=In+S=F+T=P+J=100%)

### Secondary measures: some of the nitty-gritty

- Response style:** 'Extreme' (i.e., tending to score at either end of a scale, ERS) or 'Midpoint' (tending to score towards the middle of the scale, MRS):  
A third of NRS-M ERS respondents also used an ERS for the EI questionnaire.
- Responsiveness:** Hierarchical cluster analysis of the NRS-M partially confirmed a difference between 'strong' (22) and 'weak' (27) responders across subscales.
- Graphology variables 1:** There was a strong interaction between 'Verticality' (marking NRS-M above or below the line, or on it, as instructed) and 'Shape' (using an 'X', as instructed, or using another shape, e.g. 'O') (Chi<sup>2</sup>=32.87, p<0.001).
- Graphology variables 2:** The number of times marks were positioned above NRS-M decade markers (11, 22 etc.) was significantly greater than the number of times they were positioned below them (19, 38 etc.) (Binomial test, p<0.001).
- Shannon entropy:** This first attempt to use Shannon entropy to analyse questionnaire results was disappointing. However, a hypothesis for further study would be that more variability (or uncertainty) in responses to questionnaires on emotional topics may be associated with greater emotional awareness or responsiveness.
- Secondary measures – Jungian type and emotional intelligence:** There were very few meaningful associations between secondary measures and type or EI.

### Where next?

These methods and results may be helpful when entering the uncharted waters of our next major project, 'Who responds well to acupuncture?', but are nowhere near sufficiently robust to create a regression model of who is likely to be a 'good' or 'positive' responder.

### Conclusions

When assessing changes in response to treatment, consider the personality and emotional style of your patients, and also how they complete the outcome measures you use.

### A ragbag of results ...

- Mood changes exhibited a 'regression to the median' (initially high scores would decrease, and low scores increase) (p<0.01).
- Furthermore, 'positive' moods (e.g. 'Relaxation') tended to increase and 'negative' moods (e.g. 'Gloomy') to decrease (Chi<sup>2</sup>=33.99, df=2, p<0.001).
- Intuitive Jungian (Myers-Briggs) types outnumbered Sensing types, and Feeling types outnumbered Thinking types (see **Table**), supporting the view of acupuncturists as likely to be – or to consider themselves as – more 'touchy-feely' (more accurately, Intuitive Feeling) than thinking types (p<0.001).
- In support of this, several emotional intelligence (EI) dimension scores for these acupuncture students appeared significantly higher than the reference norms for the general population (1-sample T test, p<0.01 or p<0.05).
- There were also differences in response between Introverts and Extraverts, the former being likely to be more anxious and gloomy, and less comfortable or relaxed, after EA (p<0.05).
- Several dimensions of EI that can be considered as markers of self-regulation (e.g. self-motivation and optimism) were significantly more prominent for 'good responders' than 'poor responders' (p<0.05).
- Those who initially felt more 'Gloomy' were slightly more likely to position their X below the line when scoring their moods using the NRS-M, whereas EI 'Optimism' tended to be higher in those scoring above the line (n.s., but intriguing).
- Students were enthusiastic about the acupuncture treatment they had received themselves in the past (p≤0.001), but not overly impressed by the lifestyle advice their practitioners gave them (p=0.158).

### ... And a caution

- Many statistical tests were conducted in this study, so that at least some of these findings are likely to be the result of chance. They should therefore be treated with caution rather than embraced uncritically. Further research using these methods with larger groups is recommended (effect sizes for these findings were mostly small to medium).