



Research Letter from:... Hypnotic Finland

That Unique Hypnotic Stare

By our corresponding author, **Ainutlaatuinen Virtuoso**

Hypnosis is one of those subjects everyone knows about but about which not so much is known. What is really happening when someone is hypnotised? Is it a kind of dream or trance or a special hypnotic state that is completely outside the range of normal mental states and cognition?

Finland's Sakari Kallio now claims to have shown "The Existence of a Hypnotic State Revealed by Eye Movements" (*PLoS ONE* 6(10): e26374). In effect, Kallio, from the Centre for Cognitive Neuroscience at the University of Turku, has used "oculomotor tasks that trigger automatic eye behaviour" to find a statistically significant difference between hypnotised and control subjects. He says, his study is the first demonstration of a special hypnotic state. But just how general an effect can Kallio claim to observe when he only hypnotises a single person, a woman codenamed "TS-H"?

Ratio of controls to hypnotics: 14 to 1 !

Yes, Kallio seems to have had great difficulty in finding Finnish subjects to hypnotise. In fact, "TS-H" is a "43-year-old right-handed female office worker with normal vision", who has been under Kallio's 'influence' since at least 1999, when he first published her 'case'. TS-H also stars in two other papers in 2007 and another two in 2011 (including the present study).

So what makes TS-H so special? She's a virtuoso! Hypnosis, it appears, requires little more than concentrating on a voice that gives a suggestive command like: "When I count to three, you will close your eyes". But what happens next depends on the degree of susceptibility.

For those who are 'low hypnotisable', being hypnotised has been described as like listening to a relaxation tape that goes on too long but for 'high hypnotisables', known as 'virtuosos', the effects are compelling.

TS-H "experiences vivid visual and acoustic hallucinations in response to suggestions during hypnosis". She herself "describes the experience of hypnosis as a feeling of calmness and relaxation" but does not remember what was said during hypnosis nor does she experience anything "special or strange".

However, Kallio says that what makes TS-H "an ideal subject" for hypnosis experiments is that she responds immediately and invariably to a posthypnotic suggestion about entering hypnosis by "spontaneously showing clear behavioural signs of a hypnotic state". She becomes immobile, her eye-blink rate decreases and her eyes appear to lack a fixation point.

In effect, Kallio can instantaneously turn TS-H on and off, like a hypnotic machine. A few days before the experiment, he gives TS-H a "standard hypnotic induction" then gives her a "posthypnotic suggestion" – instructions that certain words uttered by the experimenter will induce and cancel hypnosis. In this case, the word "hypno" was chosen to be the cue for entering hypnosis and the word "base"

for returning back into the normal state. You can see Kallio turning TS-H on/off like this in "Movie S1".

Previous studies of TS-H showed that, during hypnosis, she had greater auditory "mismatch negativity (MMN) responses" (1999), or that she had a "different pattern of brain oscillations" (2007). This time, Kallio subjected her to three optical tasks – 'Fixation' for the pupillary reflex (stare at a target while the background luminosity is varied), a 'saccade' (fast exploratory eye movement around a single target) and the optokinetic reflex (an automatic to-and-fro oscillation of the eye).

From "case study" to controls

The big difference in Kallio's latest examination of TS-H is that other experimental subjects are also tested. Previously, Kallio's articles treated TS-H as a unique 'case study' but, this time, there is a control group for comparison.

So, on the one hand, we have TS-H being turned on/off during the three oculomotor tests (as shown in Movies S1, S2 and S4) while, on the other hand, there are 14 control subjects (6 men, 8 women, mean age 42.6 years).

Oddly, Kallio doesn't try to hypnotise anyone else. Instead, he trains his controls to try very hard to imitate TS-H's bizarre eye motions. To do this, they are shown a video of TS-H in action, given a verbal description of her "staring eyes, almost petrified stance" and how her eyes moved during specific tasks.

Kallio says some of the controls got quite good at this hypnosis simulation, especially in the Fixation task, when they mimicked the "trance stare", but "at the group level the changes were far less marked". Overall, even when they tried hard, his controls couldn't quite match TS-H's 'Hypnotically Induced Stare'. Her eyes moved more slowly: the amplitude, velocity and frequency of reflexive saccades were radically suppressed, fixation time was increased and pupil size diminished during the hypnosis condition.

So, what does Kallio conclude from the ongoing case study of his single "virtuoso" and the 14 mimics? He assures us that "this study provides the first demonstration of the existence of a special hypnotic state". However, towards the end of the paper, he finally admits it may be hard to generalise too far, "Since we only presented the results of a single case, we cannot draw conclusions about hypnosis in general or even about other hypnotic virtuosos."

In fact, it might not be "a normally distributed psychological phenomenon in the whole population but rather a rare and exceptional neural property or cognitive 'skill'

found in only very few individuals". So, TS-H could be unique?

"In any case, our theories and background assumptions concerning hypnosis need to be revised in the light of present results." Why? You know, this tale of TS-H reminds one of another form of entranced attention – a classic "Shaggy Dog Story"!

