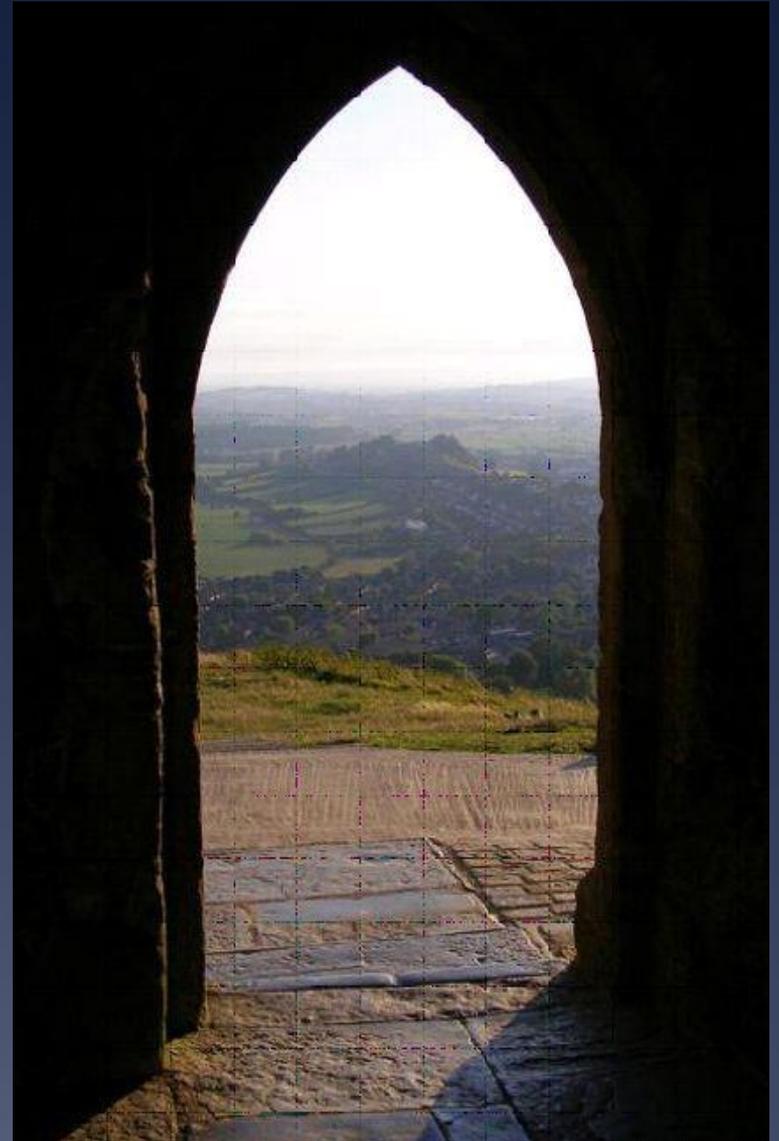




Derangement of the Senses or
Alternate Epistemological
Pathways?
Altered Consciousness and
Human Potentials

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Outline

(Dis)advantages of ordinary/waking Cs.

- * Altered (alternate) consciousness
 - * Definition and description
 - * Induction and individual differences
 - * Enhanced physiological control
 - * Enhanced psychological function
 - * Altered consciousness and psi research

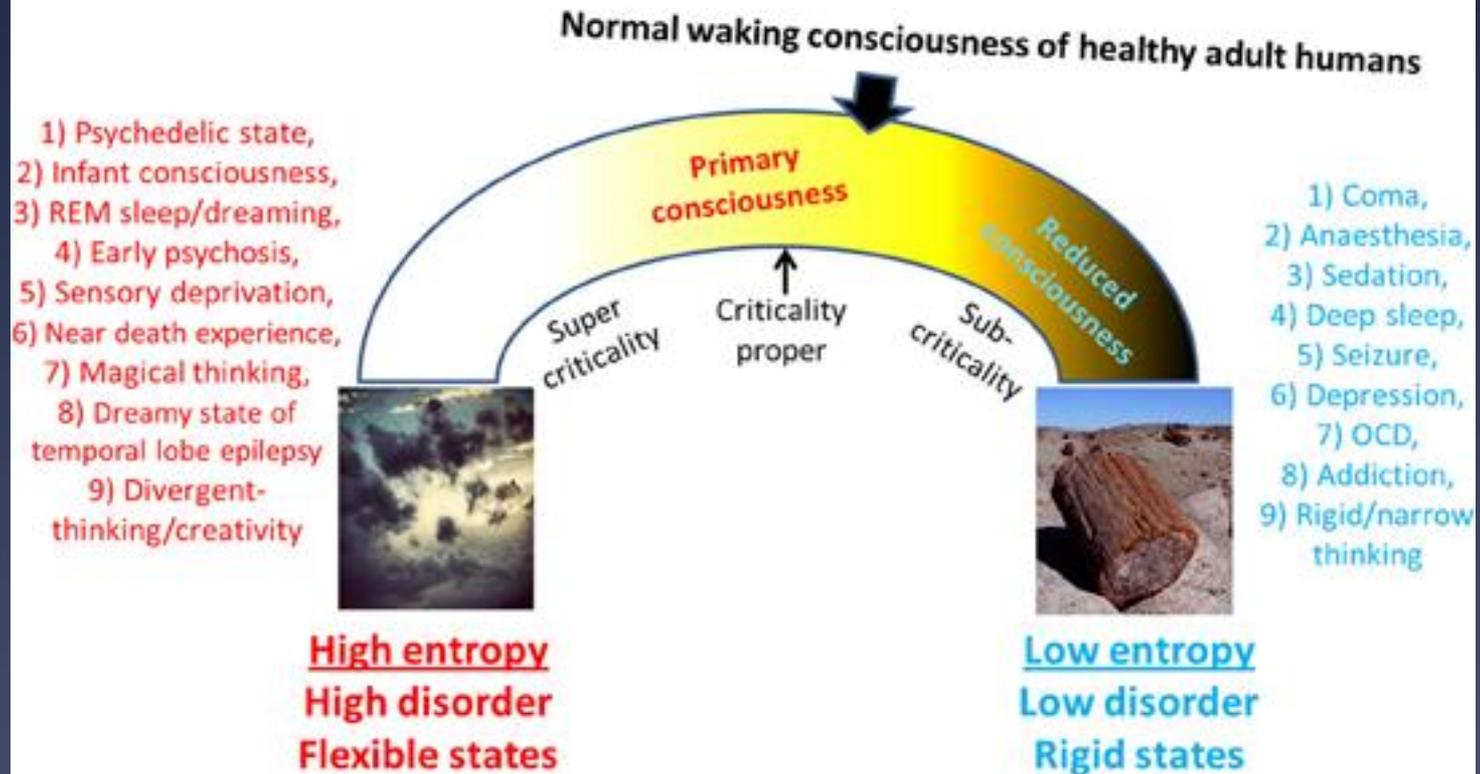
The Ordinary Waking State (OWS)

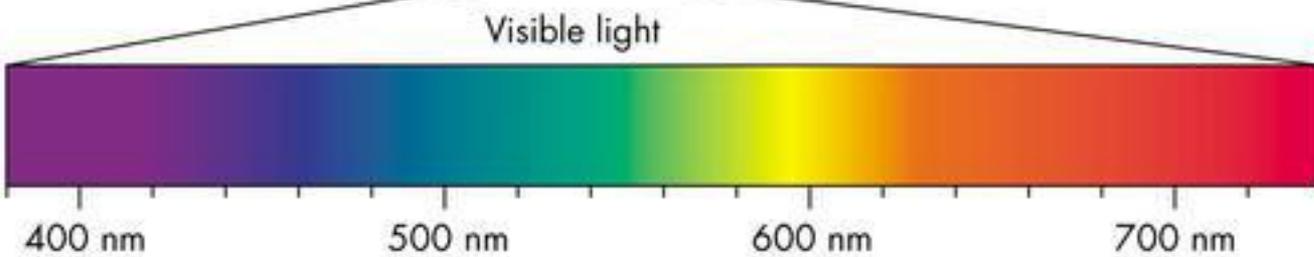
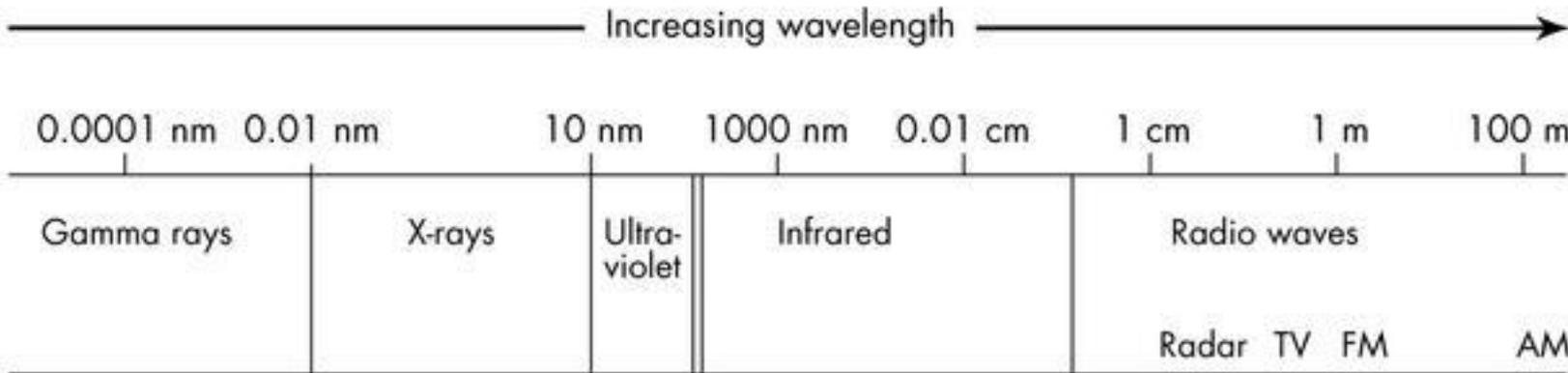
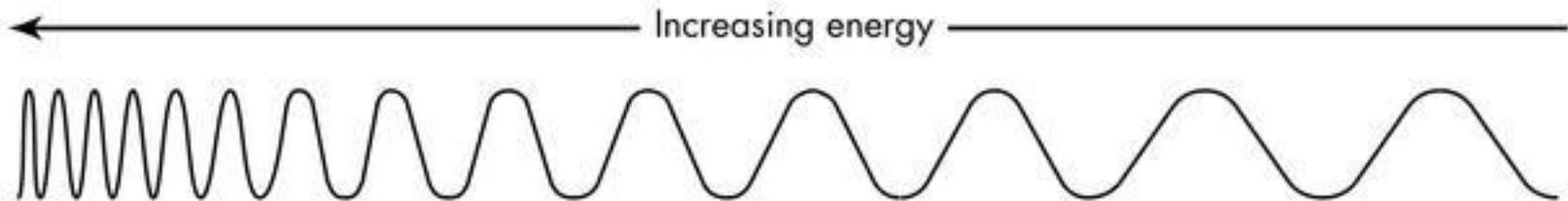
- OWS
 - adequate for everyday survival
 - provides some order and stability
 - suited for large, external changes
- But...
 - sensory limitations
 - cognitive limitations (e.g. limited sensory memory; primacy of visual channel)
 - very limited processing capacity (little information reaches Cs)
 - somewhat egocentric and rigid (e.g., inattentional blindness)
- Evolution:
 - favors important ecological stimuli (e.g., large changes)
 - does not favor a very accurate depiction of “reality”

States and Brain Entropy

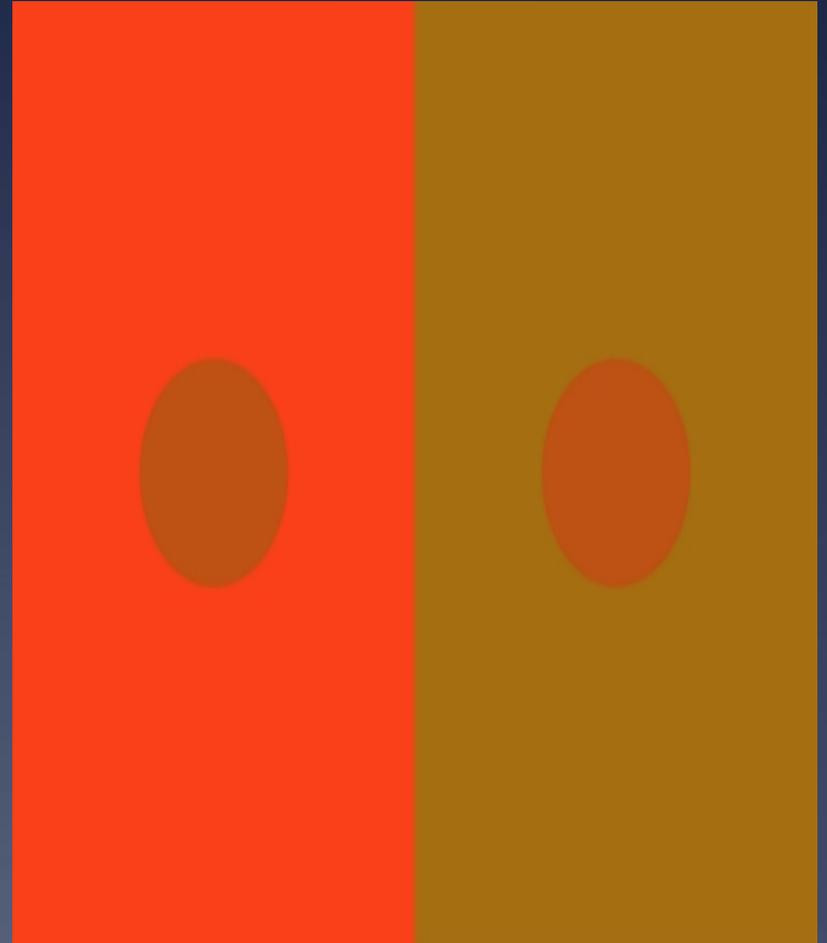
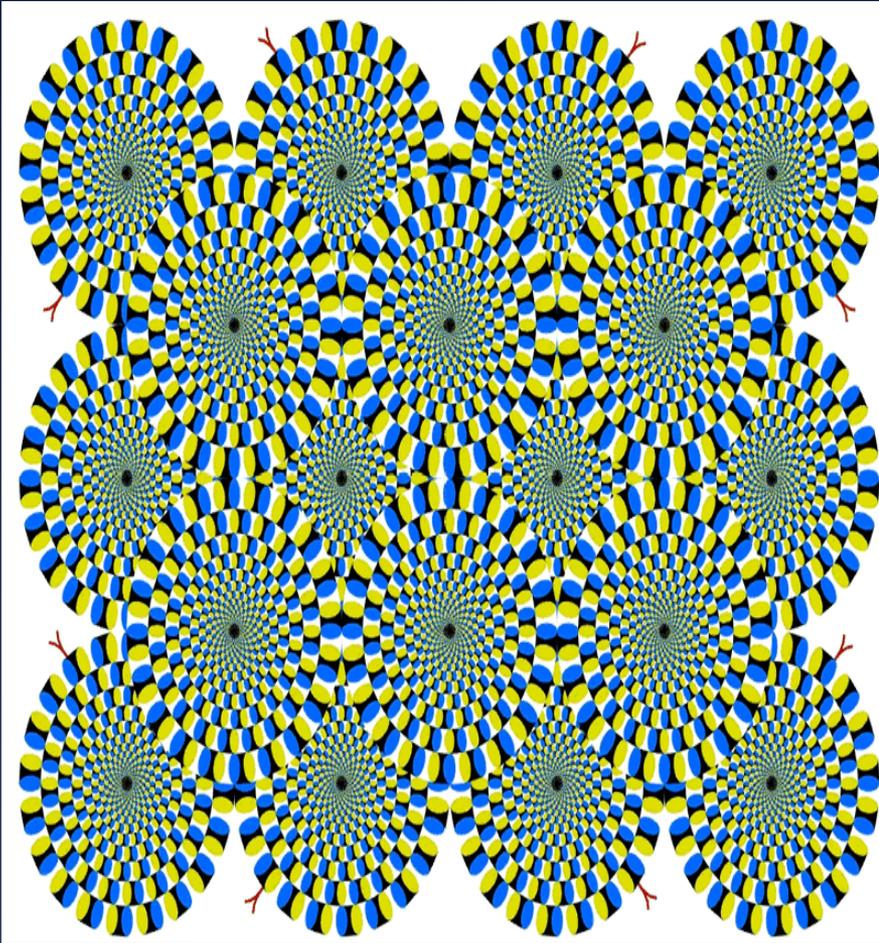
(Cardeña et al., 2013; Carhart-Harris et al., 2014)

The entropic brain hypothesis

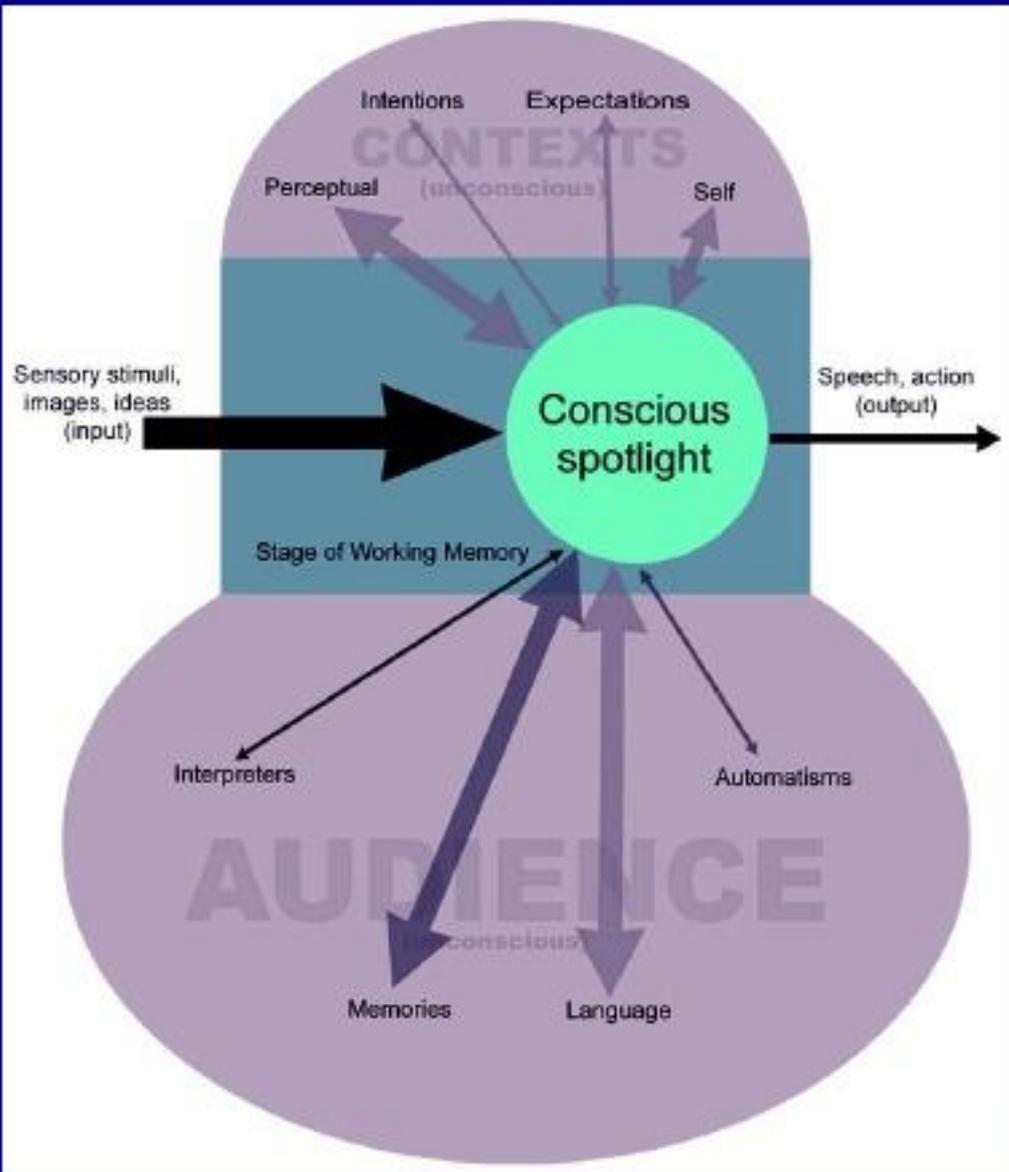




Static Optical Illusions



In the Theater of Consciousness - a useful theoretical metaphor



--- only the bright spot on stage is conscious (because consciousness is very limited in capacity)

--- sensory inputs compete for access to the conscious bright spot; so do output plans;

--- the "theater stage" corresponds to Working Memory;

--- all other parts are unconscious, including longterm memory, the automatic processes of language, and events going on backstage. (The capacity of unconsciousness is enormous.)

-- the theater metaphor has been turned into several testable models.

Modalities of Experiencing



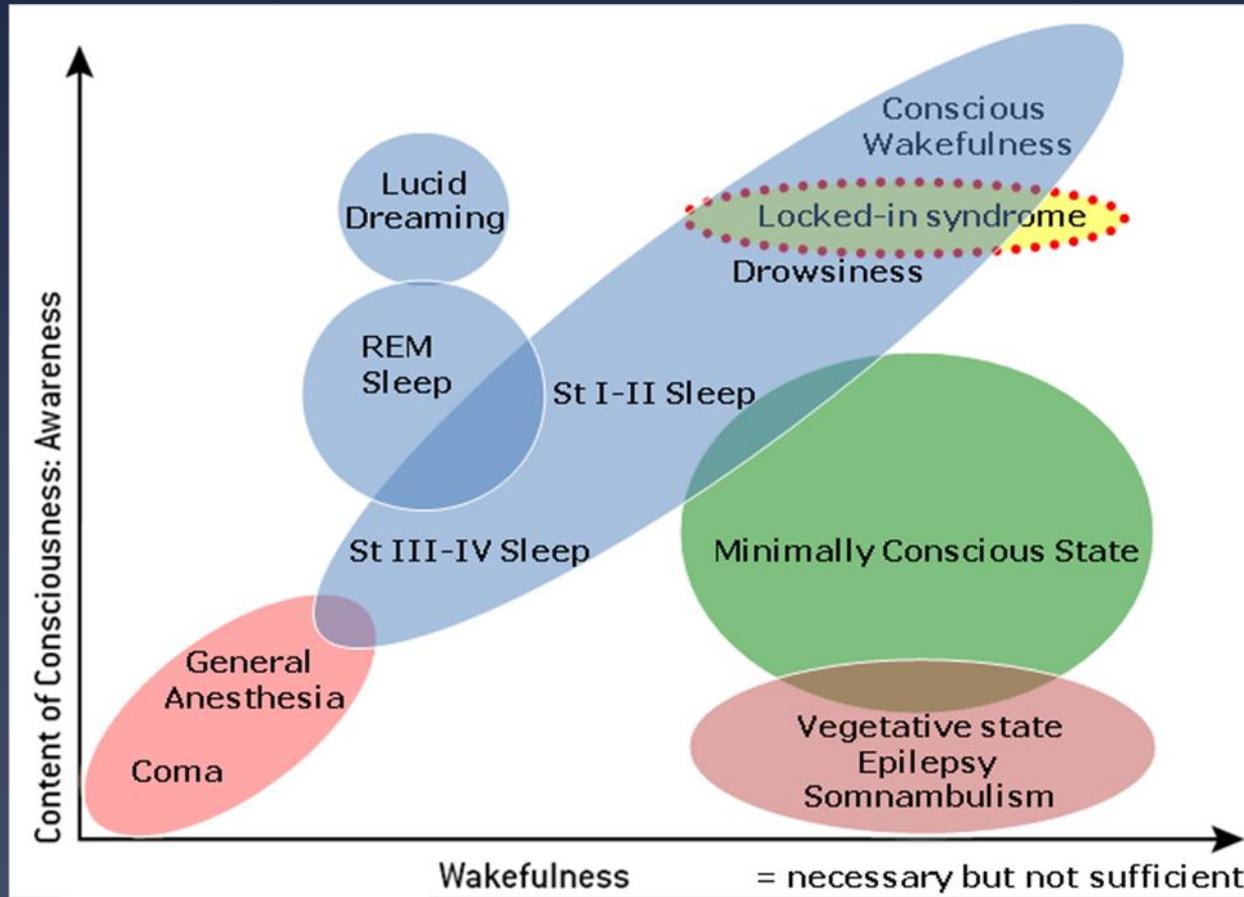
- * “Phenomenal contents of consciousness that misrepresent or create delusional beliefs” (Kallio & Revonsuo, 2003) vs.
- * Our normal waking consciousness... Is but one special type of consciousness, whilst... there lie potential forms of consciousness, entirely different... **definite types of mentality which probably somewhere have their field of application and adaptation.** (William James, 1902)

Altered Consciousness

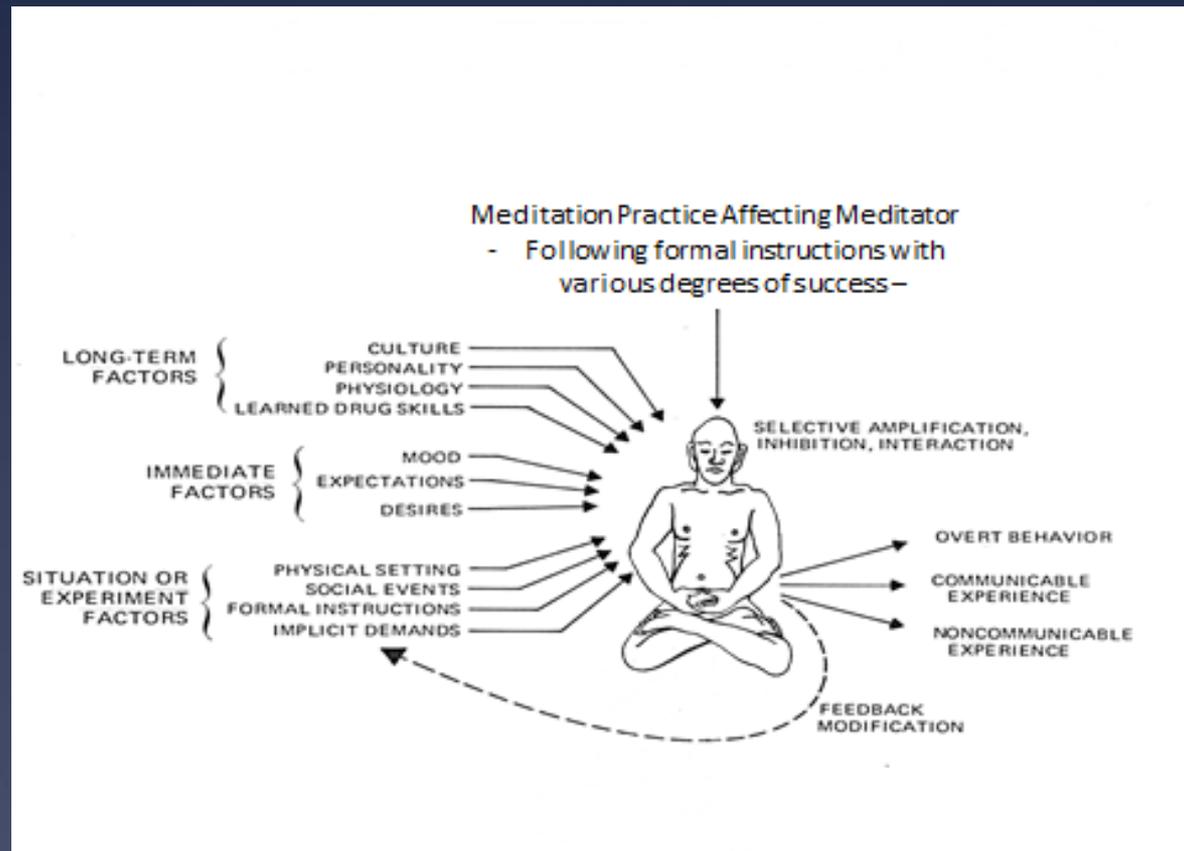
- * State of consciousness = transitory and reversible pattern of subjective experience and behavior (e.g., waking state, intoxication).
- * Altered state of consciousness (ASC) = a short-term different state from the baseline
- * Altered trait of consciousness = a long-term different state from the baseline

A Taxonomy of Some States

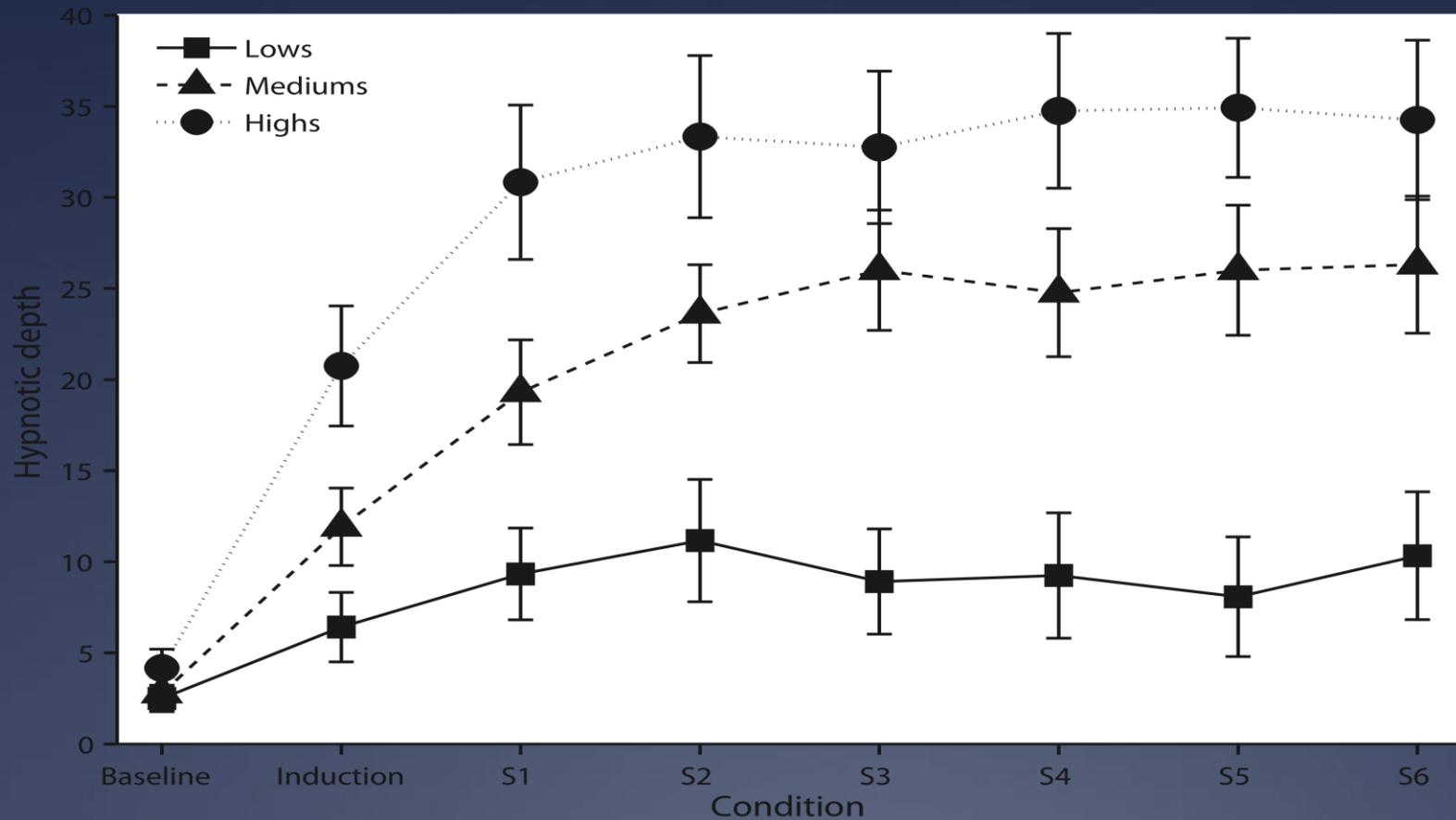
(Noirhomme & Laureys, 2011)



Induction of an ASC (from Tart, 1975)



Individual Differences in Experiencing ASC



Enhanced Physiological Control- Dermatological (and Other Systems such as Gastrointestinal)

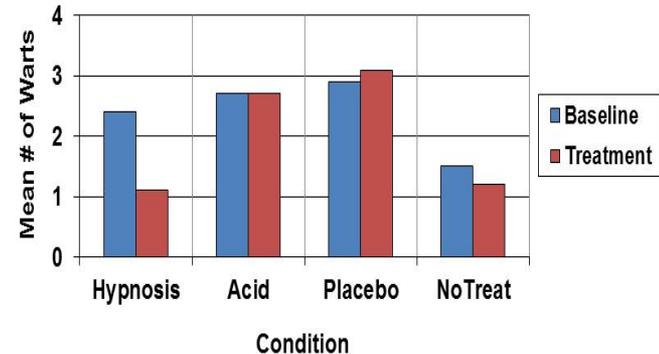
Hypnosis for congenital erythodermia (Mason, 1952)



Warts

Hypnosis, Salicylic Acid, and Warts

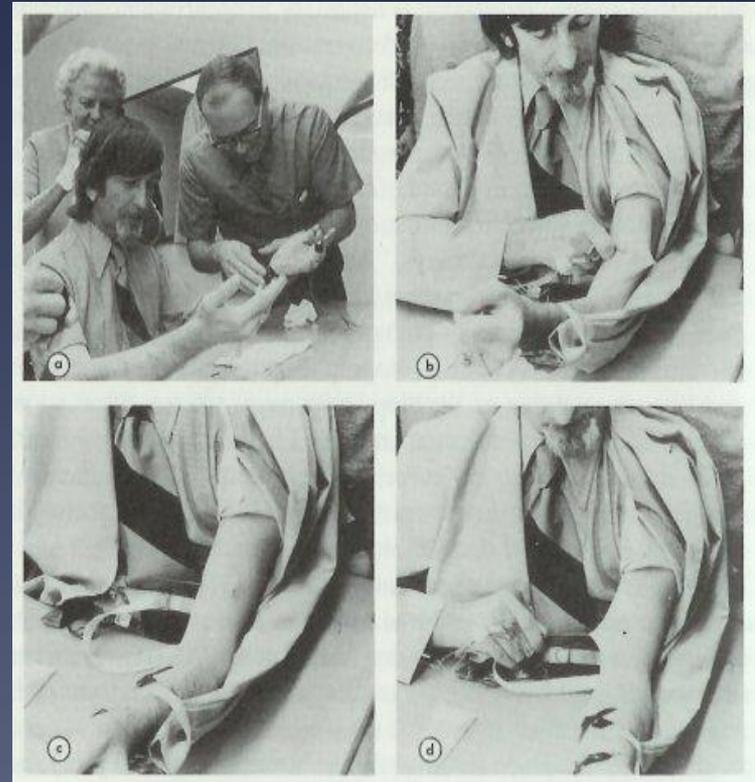
Spanos, Williams, & Gwynn (1990)



Enhanced Physiological Control – Heart Rate and Bleeding Control

Eastern and Western Yogis
ability to begin or stop
bleeding (Murphy, 1992)

Four Yogis showed they could
slow or even momentarily
stop HR and make pulse
very faint (Wenger et al.,
1961); perhaps mediated
by breathing control
(Deepak et al., 2013)



Enhanced Physiological Control – Decreased Metabolism



- * 40% decrease of O₂ use during a 4 hour meditation (Craig et al., 1987)
 - * replicated in a group study (Telles et al., 2000)
- * Yogi buried in underground pit for 8 days
 - * Increase HR, then non-detectable, then increased HR shortly before being raised (Kothari et al, 1973)

Enhanced Physiological Control – Ability to Withstand Cold

- * Wim Hof, holder of records for enduring cold, showed greater cortisol release during immersion (Kox et al., 2012)
- * *g Tum-mo* yoga practitioners can raise body temperature by more than 8° (Benson et al., 1982), through breathing and visualization (Kozhenikov et al., 2013)
- * Also demonstrated with hypnosis (Maslach et al., 1972)



Enhanced Physiological Control – Analgesia



Evidence based HA

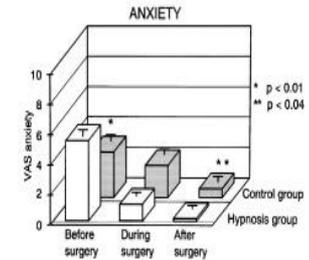
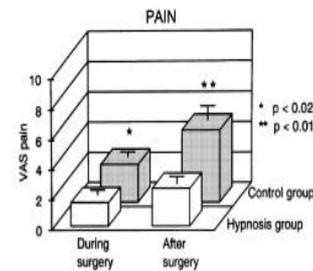


Pain 73 (1997) 361-367

PAIN

Psychological approaches during conscious sedation. Hypnosis versus stress reducing strategies: a prospective randomized study

M.B. Faymonville^{1,*}, P.H. Mambourg², J. Joris³, B. Vrijens⁴, J. Fiasette⁴, A. Albert⁵, M. Lamy⁶

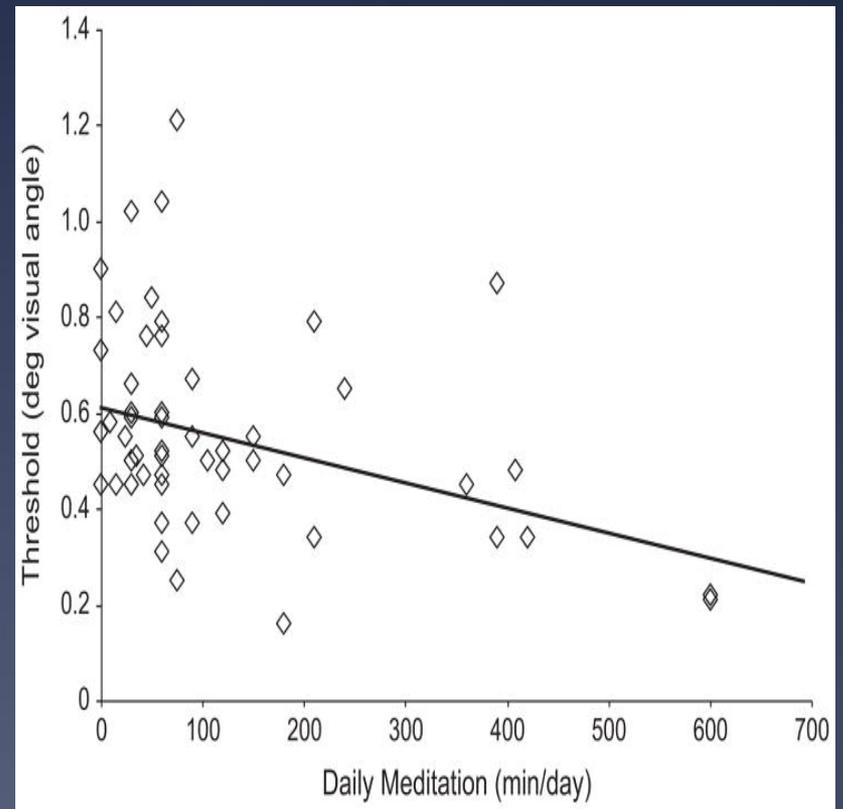
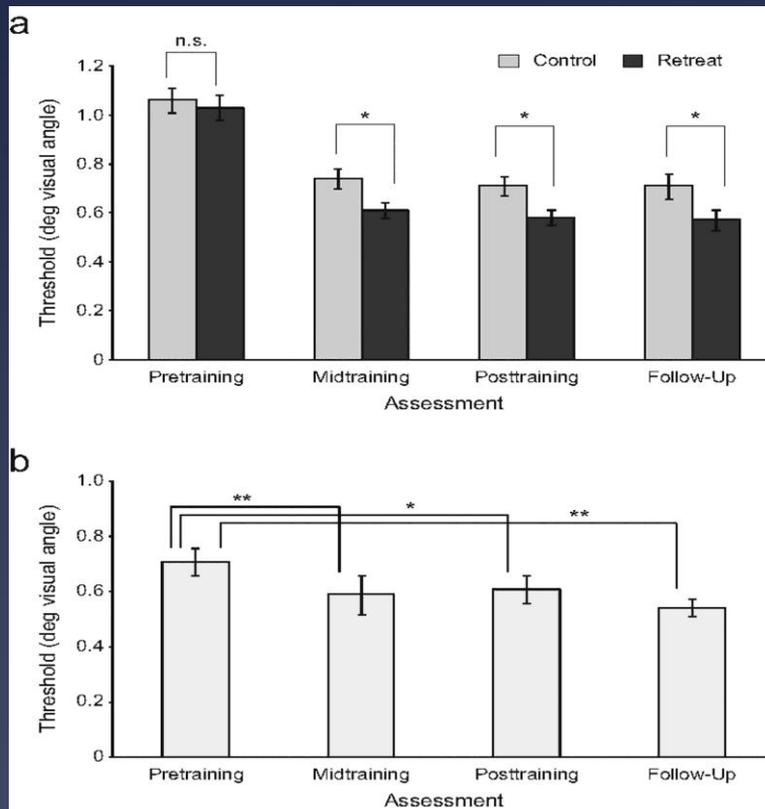


Also supportive research on analgesic effects of meditation and psychedelics.

Enhanced Psychological Function – Perceptual Sensitivity

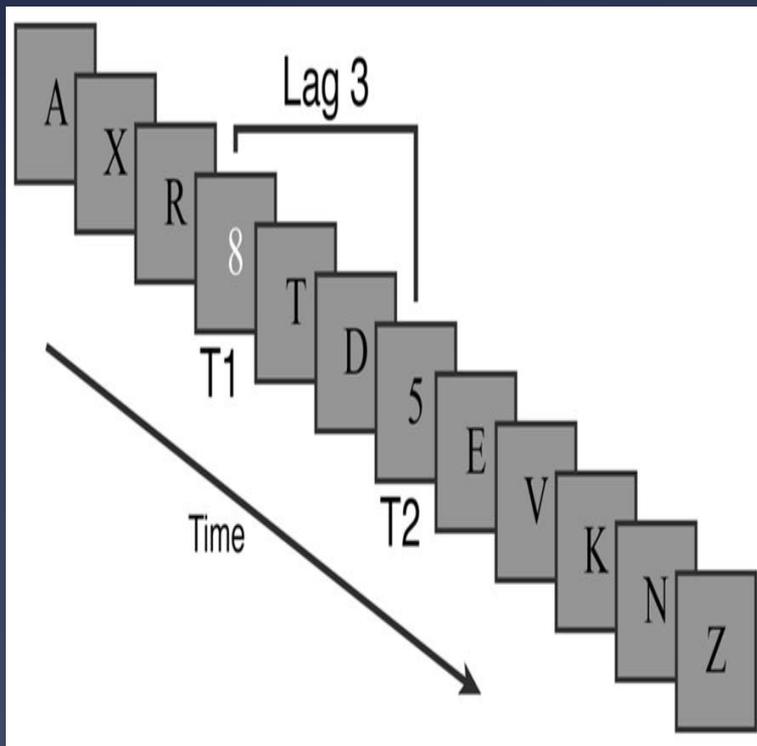
↑ Perceptual Sensitivity (MacLean et al. 2010)

(MacLean et al. 2010; also Brown et al., 1984)

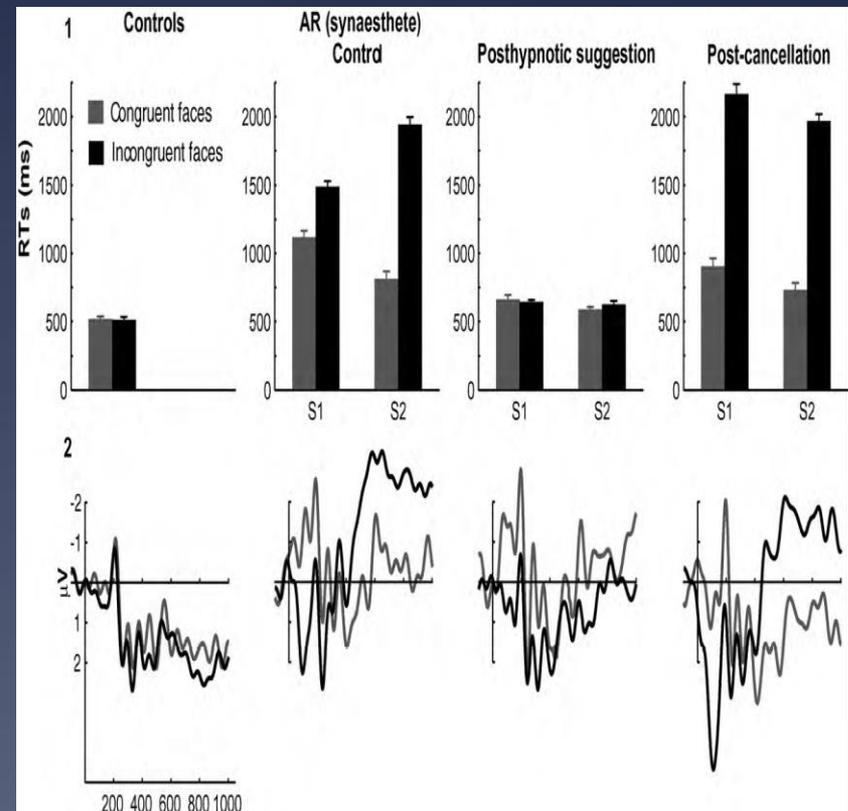


Enhanced Psychological Function – Deautomatization

↑ Performance in Attentional Blink Test (trait/state meditation; Lorenzo et al. 2015)



Elimination of synaesthesia (Terhune, Cardeña, & Lindgren, 2010; see Raz et al., 2002 for stroop)



Enhanced Psychological Function – Attention

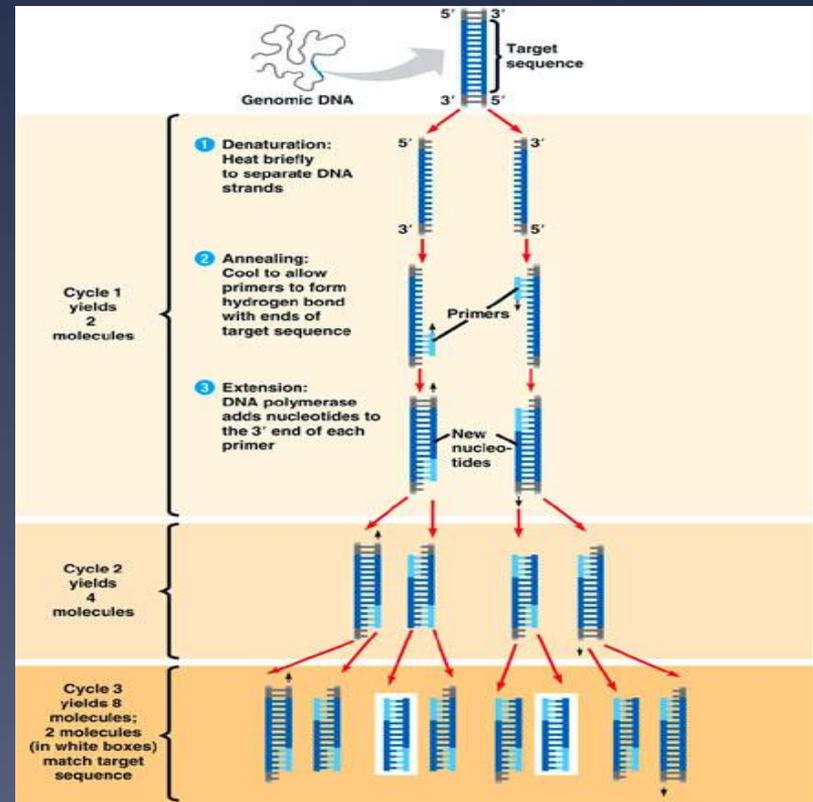
- * Continuing to pay attention despite habituation (Antonova et al., 2015; Kasamatsu & Hirai, 1966)
- * Selective attention (Jha et al., 2007)
- * Vigilance/sustained attention (MacLean et al., 2010; but see Cardena, Sjöstedt, & Marcusson-Clavertz, 2015)

Enhanced Psychological Function- Creativity

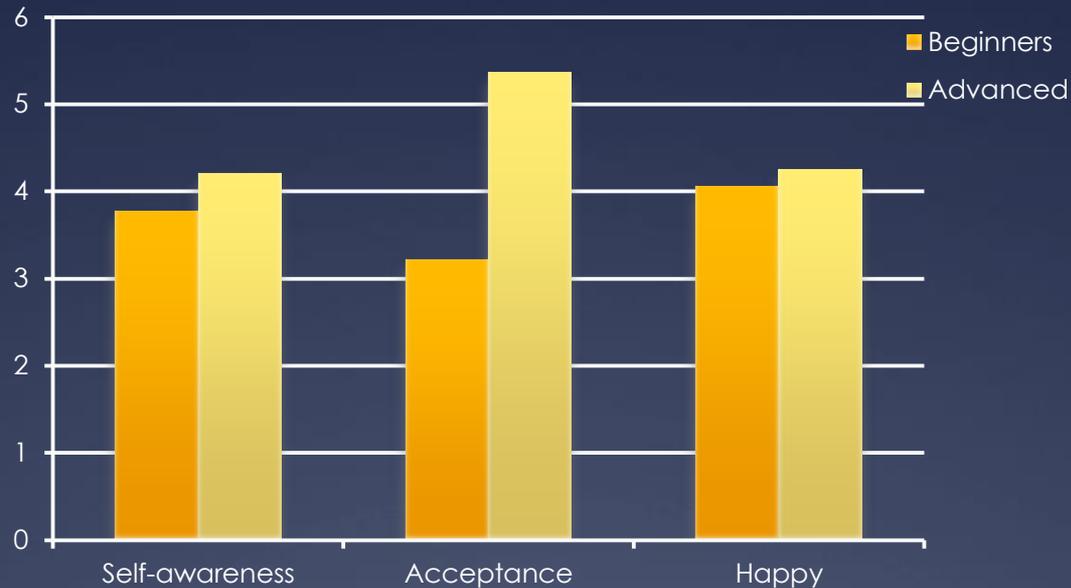
Enhanced creativity through imagined or counterfactual experiences during ASC (e.g., Nobel Prize winner Kary Mullis's discovery of polymerase chain reaction; innovations in the arts, etc.)

Increase of creativity with psychedelics (Krippner, 1985) or hypnosis (Council et al., 2007)

Alcohol intoxication can enhance verbal associations (Jarosz et al., 2012)



Enhanced Psychological Function – Emotional Equanimity (Easterlin & Cardeña, 1998/1999)



* Consistent with state and trait meditation research on amygdala activity (Desbordes, 2012; Taylor et al., 2011)

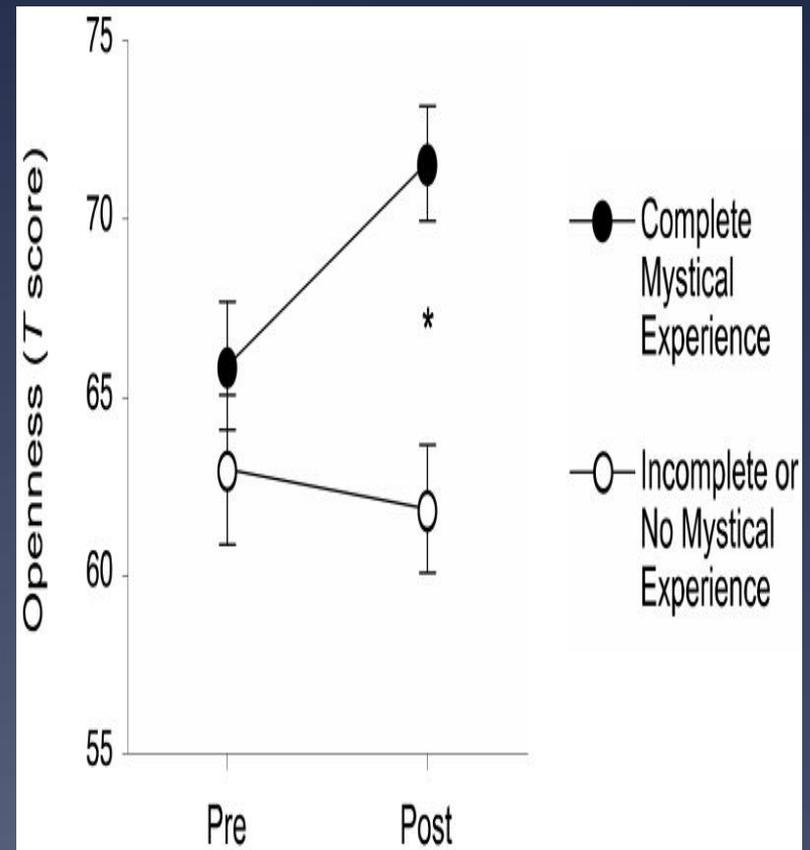
Enhanced Psychological Function – Psychotherapy

Evidence-based therapeutic use of hypnosis
and meditation for various psychological conditions
(e.g., Mendoza & Capafons, 2009)

- * Uses of hallucinogens (some moderated by level of experience and absorption trait) for:
 - * Alcoholism
 - * Anxiety related to death
 - * Depression
 - * Smoking
 - * Obsessive-compulsive symptoms
 - * Recidivism?
 - * (Garcia-Romeu et al., 2016)

Enhanced Psychological Function— Personality Change

- * ↑ openness to experience after psilocybin session for mystical experiencers (MacLean et al., 2011)
- * NDEs related to
 - * ↑ sense of spirituality,
 - * ↑ concern for others and environment
 - * ↑ appreciation in life
 - * ↓ fear of death
 - * ↓ materialism
 - * ↓ competitiveness
 - * (Greyson, 2014)



Altered Consciousness and Noetic Experiences

- * Noetic experiences are “states of insight into depths of truth unplumbed by the discursive intellect...illuminations, revelations... carry with them a curious sense of authority” (William James, 1902)
- * Research on unsuggested/spontaneous experiences during “neutral” hypnosis (Cardeña, 2005).
- * High hypnotizables’ experiences characterized by imagery and transcendent experiences, and brain desynchronization (Cardeña et al., 2013).
- * E: What are you experiencing?
- * P: ... This is the best place to be... I am out in the brightness (pause) I don’t want to talk... I am not matter anymore; just nothing physical, not even color. I’m just energy. (What happened to the light you were seeing?) It’s there, I’m part of it. I can’t separate my part of the light from the rest of the light... Things don’t happen here... it’s a matter of being... here there’s no time and no space.



AC and Controlled Psi Research

- * Spontaneous psi associated with ASC (Sannwald, 1963)
- * Meta-analyses of psi &:
 - * Meditation (Honorton, 1977; also Roney-Dougal, 2015)
 - * Hypnosis (Stanford & Stein, 1994)
 - * Dreaming (Sherwood & Roe, 2013)
 - * Ganzfeld

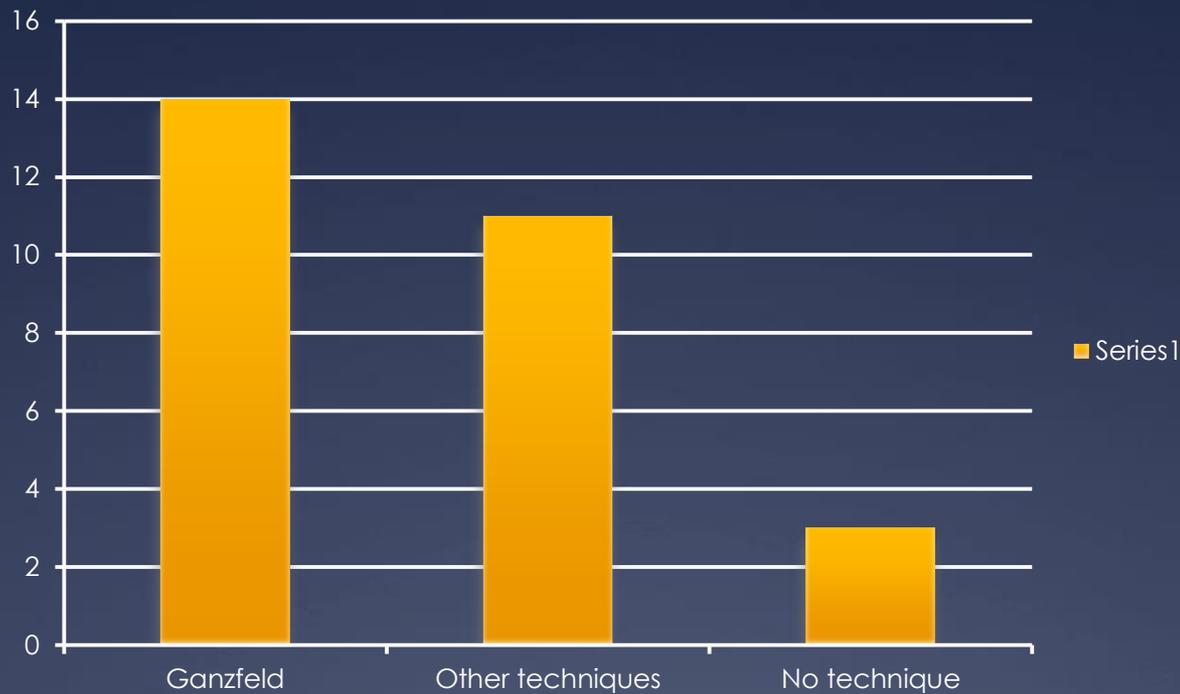


How Does Ganzfeld Research Rule Out Common Alternative Explanations?

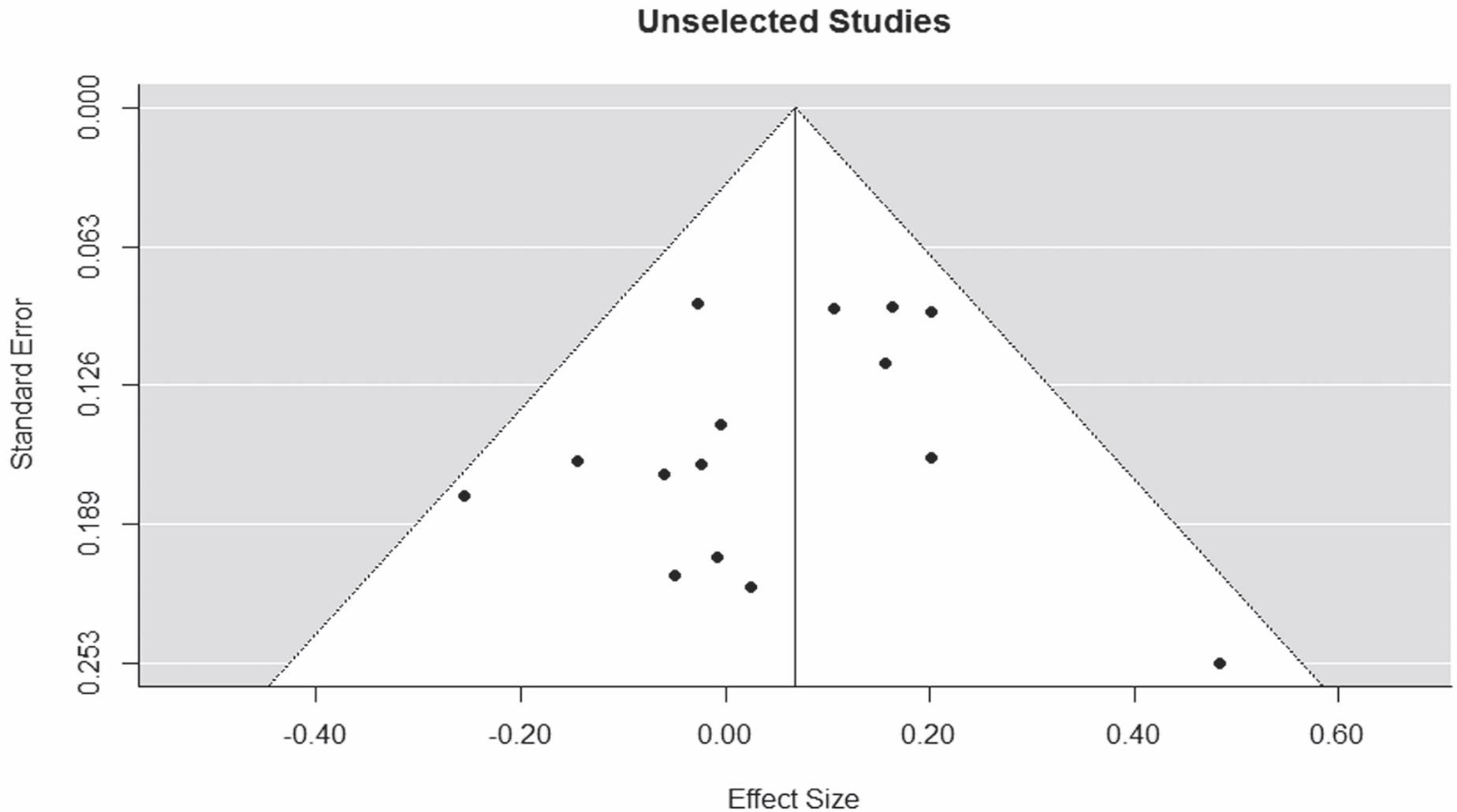
- * A “telepathy” experiment:
 - * “Sender” and “receiver” in separate rooms
 - * Sender views randomly selected target
 - * Receiver reports mentation
 - * Mentation judged against target & decoys
 - * Statistics: Is success rate better than chance?
- “Sensory leakage” (clips and mentations in different buildings)
- Cold reading (no contact between the sender and receiver)
- A tendency to choose items in a certain order (computer chooses and places target randomly)
- Randomicity (statistical analyses)
- A fluke result (meta-analyses on available studies, published or not, show a significant effect; e.g., Storm et al., 2010)

Psi Effect Size by Technique

(Storm et al., 2010)

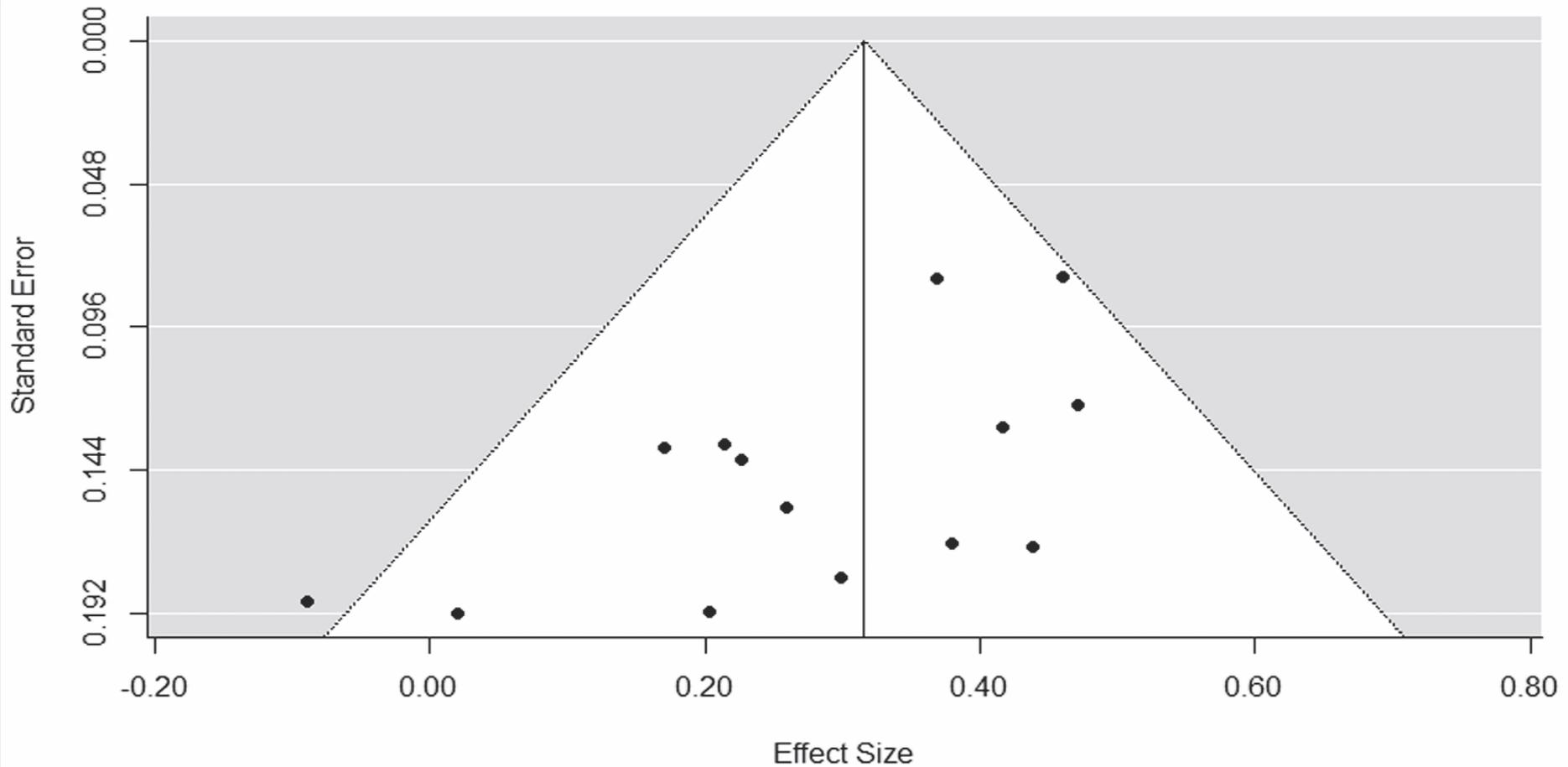


Individual Differences in Ganzfeld Psi Studies



Individual Differences in Ganzfeld Psi Studies

Selected Studies

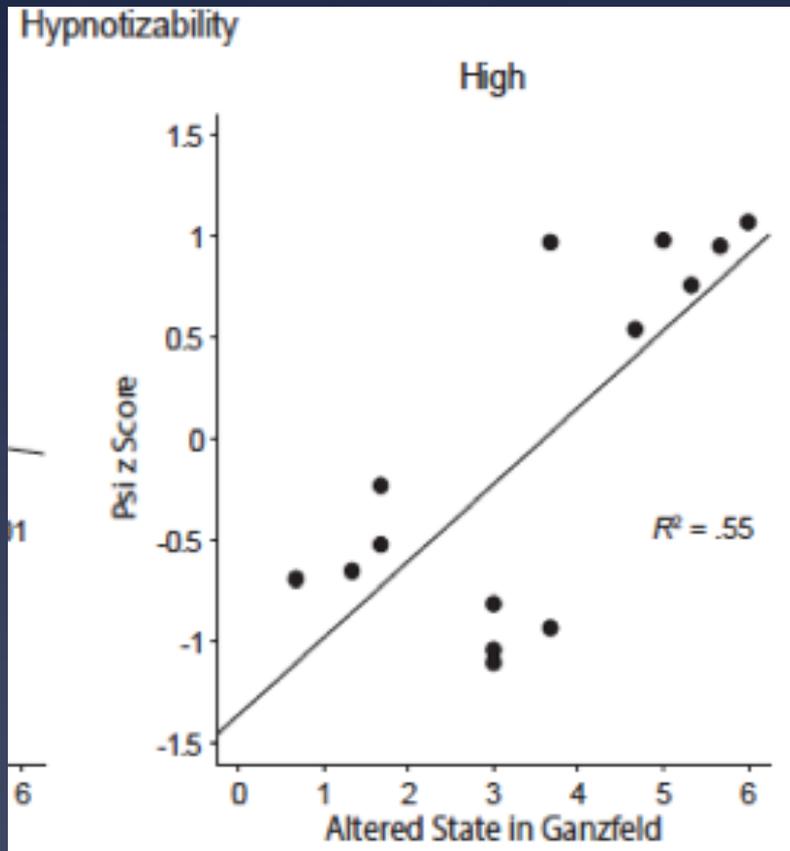


PSI and Altered Consciousness

Performance in controlled psi research related to:

- * Time distortions and reduced body awareness (Alvarado, 1998)
- * Self-transcendence (Carpenter, 2004)
- * More absorption and less arousal and internal dialogue (Roe et al., 2012)
- * Altered experience, time sense, and perception (Rock et al., 2013)
- * Shifts in Cs (Palmer et al., 1979; Sargent, 1980).
- * Two studies found no effect, but did not use validated instruments (da Silva et al., 2003; Pérez Navarro & Cox, 2012)

Interaction between Hypnotizability, ASC, and Psi



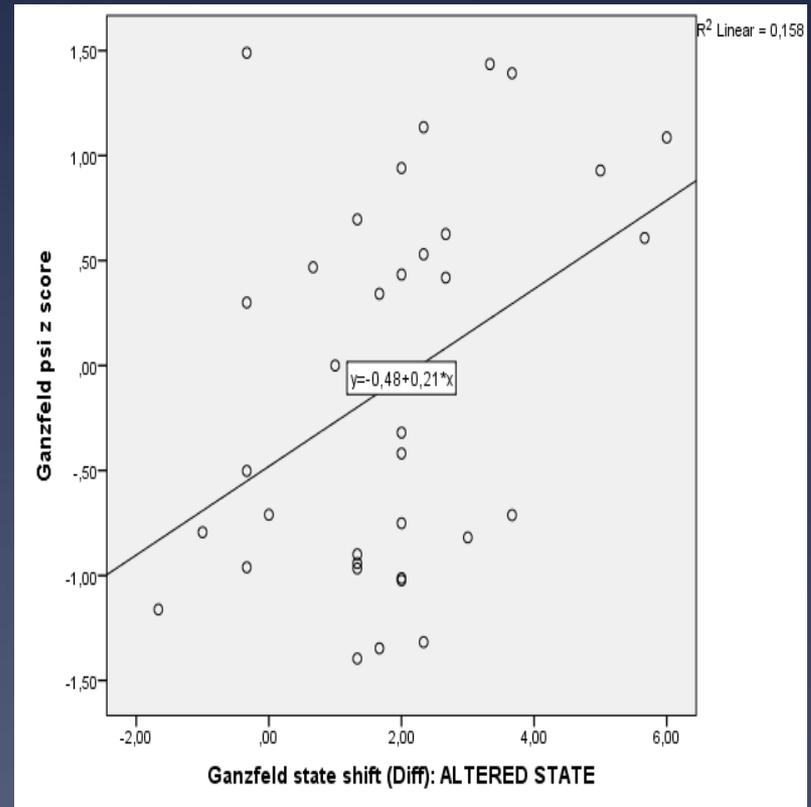
- * Among Highs, correlations between psi scores and:
 - * Being in an ASC, $r=.74$
 - * Altered Experience $r=.65$
 - * Altered perception, $r=.65$
 - * Altered time sense, $r=.60$
- (Marcusson-Clavertz & Cardeña, 2011)

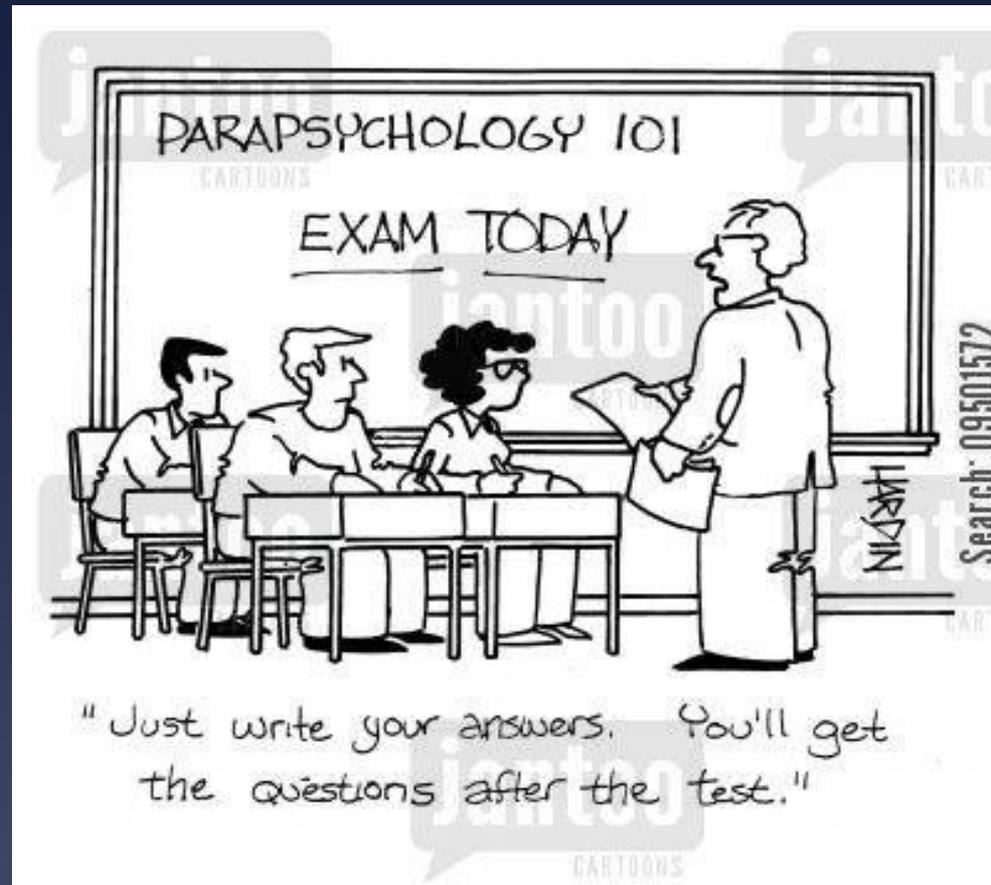
Replicated with a Larger N

Experiencing an ASC related to psi scores, $r = .40$, $p = .018$

Also, psi scores and attention, $r = .48$, $p < .01$; arousal, $r = -.40$, $p < .05$

(Cardeña & Marcusson-Clavertz, 2017)





OBRIGADO, THANK YOU, GRACIAS, FOR YOUR ATTENTION
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