Manipulating the Human Memory for Fun and Profit

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Über Mich



Definition (Outrage as a Svc @OaaSvc)

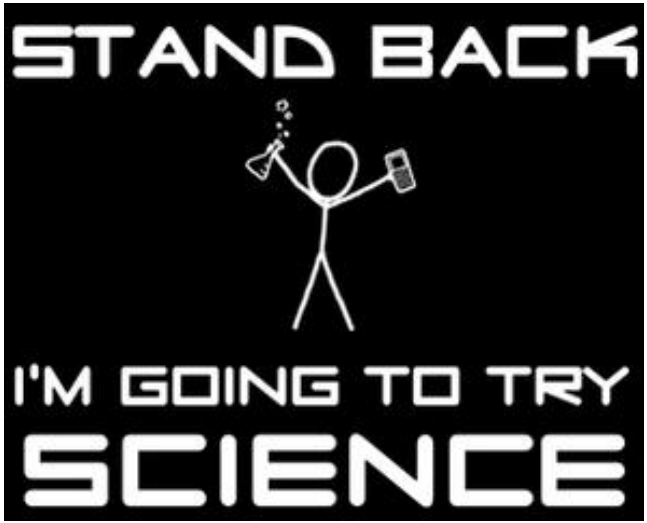
Science is awesome. You aren't doing science in infosec. Why not? Seems to be the overriding message of @0xKaishakunin #AusCERT2014



Misha Defonseca

- born Monique de Wael; 12 May 1937 in Etterbeek
- published her memoirs in 1997
- *Misha: A Mémoire of the Holocaust Years*
- wandered through Europe from Belgium to Ukraine as an 8 year old
- not the only case of made up memories

Stand Back!



False Memories

- Kraepelin, E. (1887). Ueber erinnerungsfälschungen. *European Archives of Psychiatry and Clinical Neuroscience, 18*(1), 199–239: memory falsification (Erinnerungsverfälschung, Erinnerungsfälschung)
- Cognition and Recollection are neuronal processes
- which can be corrupted/falsified
- researched since 1960s
- experiments have shown that memories can be manipulated or even completely falsified
- corruption can occcur spontaneously or triggered by a suggestion, hypnosis, stress or exhaustion
- has to be excluded from pathological delusion



False Memories

suggested false memories gain plausibility:

- the more frequently they are suggested
- the more consistent they are
- the more frequently the subject visualised the false memory
- the more emotionally they are

The resulting *false* memories are rich in detail, emotional and very credible
Ceci and Loftus (cf: 1994) and Kaplan, Van Damme, Levine, and Loftus (2016)

False Memories

- emotional stimuli have a higher impact than neutral ones
- Cortisol release strengthen the memory of emotional stimuli
- those memories are recalled more often
- depending on the mood (cf bipolar disorder)
- this affects memories and memory falsification
- does not matter if positive oder negative emotions

False Memories

- negative emotions lead to focussing
- mugging: focus on gun, because the gun is dangerous $\rightsquigarrow$ tunnel memory
- positive emotions to widening
- subject tries to memorise as much as possible, richness in details suffers
- eye witnesses can very easily be manipulated by examinations or media reports

Frenda, Nichols, and Loftus (cf: 2011) and Safer, Christianson, Autry, and Österlund (1998)

False Memories

Lost in the mall experiment

- tried to implant completely new fake memory into 24 subjects
- subjects were asked to recall 3 events from childhood
- 2 events were described by close relatives to the researchers, one event was made up
- made up event: at age 4-6 the subject got lost in a mall and was returned to the family by a helpful stranger
- relatives provided details like names of a mall and shops, names of family members etc.
- 68% (49/72) of the events were recalled correctly, 6 subjects recalled the made up event
- clarity ratings and number of subjects rose in a repeated interview and 5 subjects considered a real event to be the made up

Loftus (cf: 1997), Loftus and Pickrell (1995), and Wallach and Wallach (1983)



False Memories

Bugs Bunny in Disneyland

- created false memory of meeting Bugs Bunny in Disneyland
- Bugs Bunny is Warner Bros. and prohibited from entering Disneyland
- 16% falsely recollected meeting Bugs Bunny there, 35% in a follow-up study

Loftus (cf: 2003) and Sternberg and Sternberg (2016)

- being in a mall and getting lost there is quite common for a child
- same experiment with another false memory: getting sick and spending a night in the hospital
- same result: 20% (4/20) results recalled false memory

Hyman, Husband, and Billings (cf: 1995)



Priming

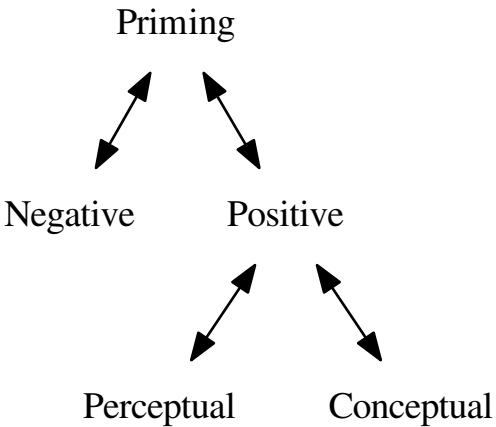
- subliminal advertising
- James Vicary: Eat Popcorn, Drink Coca Cola
- experiment was made up, bad design, technical impossible
- modern studies show subliminal messages effects – but only in labs

Priming

- implicit memory effect in which exposure to one stimulus influences the response to another stimulus
- people were faster in deciding that a string of letters is a word when the word followed an associatively or semantically related word
- Priming can occur following perceptual, semantic, or conceptual stimulus repetition
- Unconscious priming effects can affect word choice on a word-stem completion test long after the words have been consciously forgotten

Meyer and Schvaneveldt (cf: 1971, 1975), Schvaneveldt and Meyer (1973), Tulving, Schacter, and Stark (1982), and Zurif (1995)

Priming



Priming

- Williams and Bargh (2008): something as simple as holding a hot or cold beverage before an interview could result in pleasant or negative opinion of the interviewer
- Yong (n.d.): study above cannot be replicated

Theory of Mind

- ability to attribute mental states to oneself and others
- related to the concept of empathy
- can be impaired by alcohol, cocaine, ADS, schizophrenia and ASD
- cf. Kanner, Asperger, Frith, Baron Cohen

Suggestive Questions

- implies that a certain answer should be given in response
- falsely presents a presupposition in the question as accepted fact
- can create confabulation in eyewitnesses Loftus and Palmer (1974)

A good measurement

- **Reliability**: the overall consistency of a measure; measurement produces similar results under consistent conditions
- **Objectivity**: the standard of a research study such that its hypotheses, choices of variables analyzes, gauges made, methods of control, and observations are lacking bias as much as is possible
- **Validity**: Construct V. the magnitude to which an analysis or tool is able to gauge an abstract characteristic, capacity, or construct.
- *Replicability*: a study should produce the same results if repeated exactly (no one is doing it because you don't get money and fame for it)



Phrenology

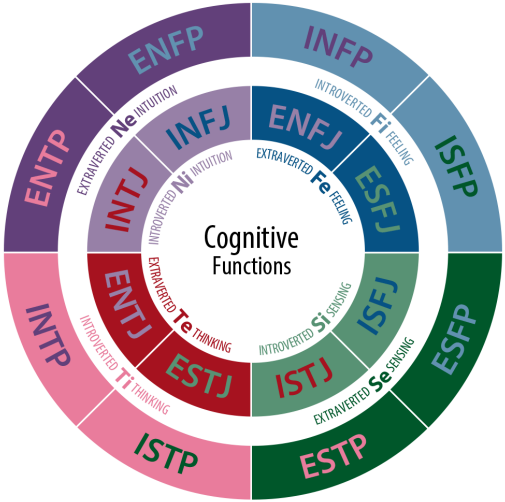


NLP

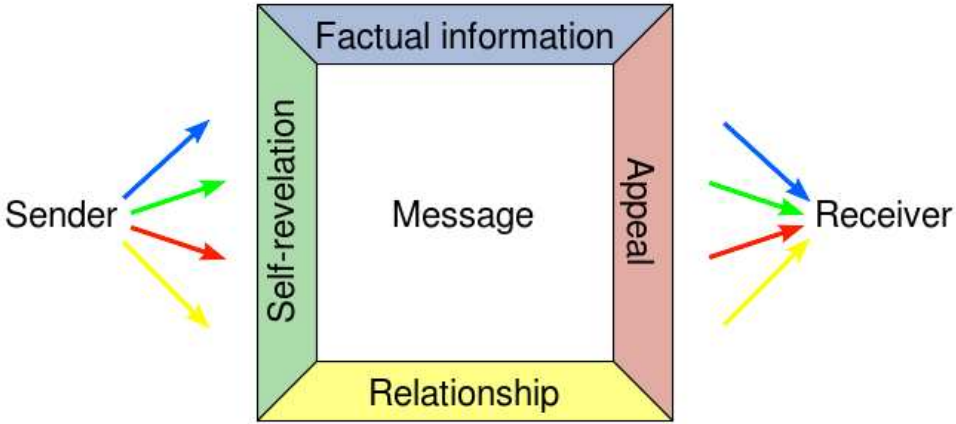
Neuro-Linguistic Programming

- Pseudoscience, neither Neuro nor Linguistic
- aggressive marketing
- Homeopathy of Psychology
- eye movemente theory could not be replicated – multiple times
- failed the 1st stage of scientific evaluation of the German health system

Myers-Briggs Type Indicator



Friedemann Schulz von Thun



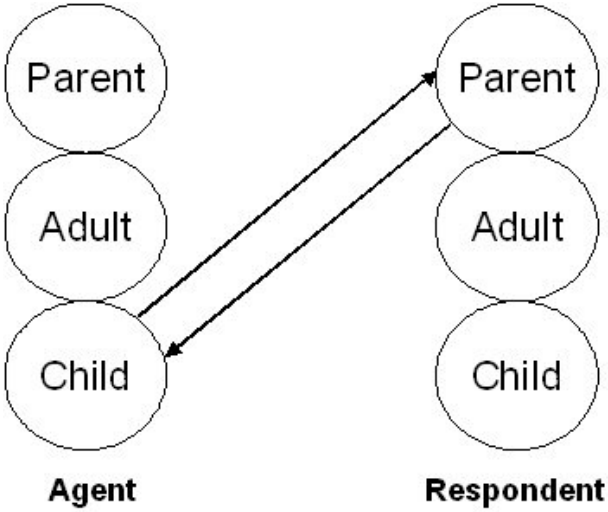
Friedemann Schulz von Thun

facts	matter of fact like data and facts, which are part of the news
self-revealing	conscious or not intended - tells something about himself, his motives, values, emotions etc.
relationship	how the sender gets along with the receiver and what he thinks of him.
appeal	contains the desire, advice, instruction and effects that the speaker is seeking for

Transactional Analysis (TA)

- Eric Berne: Games People Play: The Psychology of Human Relationships
- Theory of personality AND communication
- Thomas Harris: I am OK, You are OK

Transactional Analysis (ta)



Conclusion

- memories can be manipulated, false memories can be implanted
- try to shop pictures
- hit on emotions
- repeat the attacks
- make the victim visualise the false memory as often as possible
- use suggestive questions




MIS

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