Hypnosis

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MCDB 3650 Brain Molecules and Behavior
November 8, 2012
Hypnosis...A brief definition

- Also "hypnotherapy" or "hypnotic suggestion"
- Techniques designed to bring an individual into a hypnotic state
- Contains the Greek root hypnos, which means sleep

Hypnotic State

- A state of restful alertness
- Described as a trance-like state
- Heightened focus, concentration (i.e. blocking out distractions), and/or responsiveness to suggestions to alter one's thoughts, feelings, behavior, or physiological state
A History of Hypnosis

- Germany: Dr. Franz Mesmer becomes first to show manipulation of mind and body “Mesmerized”
- England: Dr. James Braid coins term Hypnosis
- India: Scottish born Dr. James Esdaile successfully uses for limb amputation
- Used alongside surgical anesthetics and to fix everyday ailments

- 1776
- 1842
- 1845-1851
- Present day
Dr. James Esdaile: Hypnosis and Surgery in the 1800s...

- Scottish surgeon working in India
- Performed over 300 major, 1000 minor surgical procedures using only hypnotic anesthesia
- "Painless" procedures performed: including amputations of arms, mastectomy, surgical removal of male genitalia, tumor removal, and dental surgeries

Dr. James Esdaile, photo taken from ukhypnosis.com; url: http://ukhypnosis.com/2011/03/02/on-esdaile-and-hypnotic-anaesthetic-from-the-complete-writings-of-james-braid/
Hypnotizability  (From the Scientific American reading...)

- Stanford Hypnotic Susceptibility Scales
  - scales used to determine the extent to which a subject responds to hypnosis
    - series of activities that test the depth of the hypnotic state (holding your arm outstretched or sniffing the contents of a bottle)

- Mini-Hypnosis Activity? (modified version)
  - disclaimer
Induction...[to a hypnotic state]

- **Fixed-gaze/eye-fixation induction** (i.e. the swinging pocket watch)
  - relaxed, very focused concentration

- **Rapid induction** (confusion is also a variant)
  - convincing the subject to surrender his/her conscious control over the situation (or overloading the rational brain)

- **Progressive relaxation** (most commonly used)
  - talking in a slow, soothing voice to gradually bring subject into complete relaxation and focus
Hypnosis Conception #1

Is it possible to get stuck in a 'hypnotic limbo'?
(i.e. what if your hypnotist "forgets" to bring you out of hypnosis? Not saying that that would happen...)

A. Yes!
B. No!
C. I hope not...
Hypnosis Conception #2

How much power does the hypnotist have over the hypnotized? (i.e. If the hypnotist interacts directly with the subconscious, is the 'hypnotized' slave to the suggestions of the hypnotist?)

A. Absolute power
B. Some power
C. Very little to none at all
D. Depends on the level of consciousness the hypnotist is probing (i.e. deeper = hypnotist has more power)
<table>
<thead>
<tr>
<th>IF YOU THINK …</th>
<th>THE REALITY IS …</th>
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<tbody>
<tr>
<td>It's all a matter of having a good imagination.</td>
<td>Ability to imagine vividly is unrelated to hypnotizability.</td>
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<tr>
<td>Relaxation is an important feature of hypnosis.</td>
<td>It's not. Hypnosis has been induced during vigorous exercise.</td>
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<td>It's mostly just compliance.</td>
<td>Many highly motivated subjects fail to experience hypnosis.</td>
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<td>It's a matter of willful faking.</td>
<td>Physiological responses indicate that hypnotized subjects are not lying.</td>
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<td>It is dangerous.</td>
<td>Standard hypnotic procedures are no more distressing than lectures.</td>
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<td>It has something to do with a sleeplike state.</td>
<td>It does not. Hypnotized subjects are fully awake.</td>
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<td>Responding to hypnosis is like responding to a placebo.</td>
<td>Placebo responsiveness and hypnotizability are not correlated.</td>
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<td>People with certain types of personalities are likely to be hypnotizable.</td>
<td>There are no substantial correlates with personality measures.</td>
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<td>People who are hypnotized lose control of themselves.</td>
<td>Subjects are perfectly capable of saying no or terminating hypnosis.</td>
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<td>Hypnosis can enable people to “relive” the past.</td>
<td>Age-regressed adults behave like adults playacting as children.</td>
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<td>A person’s responsiveness to hypnosis depends on the technique used and who administers it.</td>
<td>Neither is important under laboratory conditions. It is the subject’s capacity that is important.</td>
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<td>When hypnotized, people can remember more accurately.</td>
<td>Hypnosis may actually muddle the distinction between memory and fantasy and may artificially inflate confidence.</td>
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<td>Hypnotized people can be led to do acts that conflict with their values.</td>
<td>Hypnotized subjects fully adhere to their usual moral standards.</td>
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<td>Hypnotized people do not remember what happened during the session.</td>
<td>Posthypnotic amnesia does not occur spontaneously.</td>
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<td>Hypnosis can enable people to perform otherwise impossible feats of strength, endurance, learning and sensory acuity.</td>
<td>Performance following hypnotic suggestions for increased muscle strength, learning and sensory acuity does not exceed what can be accomplished by motivated subjects outside hypnosis.</td>
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Hypnotic Suggestion

Hypnotic ‘Trance’
A hypnotic ‘trance’ is the end state of a hypnotic induction. An induction is a set of instructions and suggestions which aids the focus of attention and often (but not necessarily) contains suggestions for relaxation.

Suggestion
Suggestions are instructions to experience the world in a certain way. A ‘successful’ response is where the effect feels like it is happening all by itself (involuntariness)

Some example suggestions:
“When you wake up you will find it difficult to remember your name, so difficult that you won’t even try” (amnesia)
“The sensation is draining out of your left hand, it’s feeling more and more numb” (analgesia)
“When you open your eyes you will see your best friend sitting in the chair next to you” (hallucination)

Hypnotic Suggestion
Hypnotic suggestions are suggestions delivered in a hypnotic context (after a hypnotic induction). Many people respond better to suggestions while in hypnosis but it is important to remember that it is not necessary to deliver a hypnotic induction for suggestions to be effective.

Figure taken from hypnosisandsuggestion.org; url: [http://www.hypnosisandsuggestion.org/definitions-of-hypnosis.html](http://www.hypnosisandsuggestion.org/definitions-of-hypnosis.html)
Hypnotic States in everyday life

Everyday Forms of Hypnosis?

- Reading
- Driving
- Mowing the lawn
- Watching movies

PET study (altered brain activation under hypnosis)

- Different brain regions are activated when a subject is asked to imagine a sound than when hallucinating under hypnosis.

- Figure 1 ACG region activated in the group of hallucinators by both hearing and hallucinating conditions.

Fig. 1 A.; Szechtmann et al, 1998 (mentioned in the Scientific American article)
PET study (cont'd)

- Adjusted rCBF response for each condition
- rCBF = regional cerebral blood flow
- "The man did not speak often, but when he did, it was worth hearing what he had to say"

Fig. 1 B.; Szechtman et al, 1998 (mentioned in the Scientific American article)
PET study (cont'd 2)

- Auditory association cortex activated in the group of non-hallucinators by both hearing and hallucinating conditions

- Hypnosis seemingly 'tricks' the brain into registering the hallucinated voice as real

Fig. 2.; Szechtman et al, 1998 (mentioned in the Scientific American article)
The Conscious and Subconscious in Hypnotic Suggestion

- Conscious mind: thought processes that you are aware of (main inhibitive component)
- Subconscious mind: processes that you are not [as] aware of (seat of imagination and impulse)
- Normally the conscious mind 'negatively' filters information/suggestions coming from the subconscious
- Hypnosis is believed to be accessing the subconscious mind directly
Suppression of the Conscious Mind

- Changes in brain waves (brain function) under hypnosis
  - lower frequency waves = dreaming and sleep
  - higher frequency waves = full wakefulness

- Altered activity in cerebral cortex in a hypnotic state
  - left cortex = reduced activity (deduction, reasoning, convention)
  - right cortex = increased activity (imagination, creativity, impulsivity)
Thinking about it conceptually...

Conscious Mind

Subconscious Mind
Modulation of Inhibitory and Monitoring Cortical Networks during Hypnotic Paralysis

- Hypothesis: A modulation of the anterior cingulate cortex by hypnosis might reflect the key role of the ACC in attention and executive control.
Study

participants performed a go-nogo task using both hands in normal conditions. When hypnotized participants received a suggestion that their left hand was paralyzed prior to performing the task. The control group performed the same task but intentionally simulated left hand paralysis.
Behavioral Results

In the normal state participants correctly responded to both GO and NOGO conditions. Under hypnosis the right hand accurately responded to GO and NOGO conditions while the left hand didn't move, indicating successful hypnotic suggestion. The simulated paralysis showed similar results.

Hypnosis did not impair the task performance for the non affected hand
fMRI results

"We demonstrate that hypnosis induces the control of action by internal representations generated through suggestion and imagery, mediated by precuneus activity, and reconfigures the executive control of the task implemented by frontal lobes. These findings make an important new step toward establishing neurobiological foundations for the striking impact of hypnosis on mind and behavior."
Hypnosis and the Perception of Pain

- reduce pain perception rather than altering the response to pain
- ACG - anterior cingulate gyrus (perception), not somatosensory cortex (pain response)

- Semantics in hypnotic suggestion
  - "you will feel dulled, numbed pain"
  - versus
  - "the pain will not bother you"
Some present-day applications

- **Lessening of chronic pain** (headaches/migranes, back pain, among others)
- **Oncology patients** (in conjunction with chemotherapy)
- **weight loss, smoking cessation, anxiety, phobias, stress**
- **Analgesic pre-surgery/recovery post-surgery**
Hypnosis with Conventional Anesthesia

Excisional Breast Biopsies (Lumpectomies)
The Control - Routine Anesthesia and nondirect empathic listening (control)
The Experimental - 15-minute presurgery hypnosis session by psychologist

Findings:

Less Medication used
- propofol (32.63 micrograms less)
- lidocaine (6.86 mL less) than the control group.

Decrease in:

Pain intensity & unpleasantness

nausea, fatigue, discomfort and emotional upset were all reported at significantly lower levels in the hypnosis group than in the control group.

Cost Effective:

Decreased $772.71 per patient
...Questions?
References:

Journal of the National Cancer Institute, http://jnci.oxfordjournals.org/content/99/17/1280.long
Breast Cancer Study - http://jnci.oxfordjournals.org/content/99/17/1304.abstract
"This is Your Brain Under Hypnosis" url: http://www.nytimes.com/2005/11/22/science/22hypno.html?_r=2&pagewanted=all
Hypnosis and Suggestion; url: http://www.hypnosisandsuggestion.org
http://www.scientificamerican.com/article.cfm?id=is-hypnosis-a-distinct-form
http://www.mayoclinic.com/health/hypnosis/MY01020
http://psychology.about.com/od/statesofconsciousness/a/hypnosis.htm
http://www.cancer.org/treatment/treatmentsandsideeffects/complementaryandalternativemedicine/mindbodyandspirit/hypnosis