States of Consciousness  
Sleep, Dreams and Hypnosis

1. The Nature of Consciousness
   a. **Consciousness** - A state of awareness of one's own mental processes, of ourselves and our environment.
   b. An **altered state** of consciousness is the experience which is different than when we are alert and awake.
   c. Subconscious - below level of awareness
   d. Unconscious - autonomic, never aware of it, we may attempt to control with biofeedback.
   e. Perception, memory, thinking, language, and attitudes all operate on two levels—a conscious, deliberate “high road,” and an unconscious, automatic “low road.” Today’s researchers call this dual processing.
   f. **Blindsight** a condition in which a person can respond to a visual stimulus without consciously experiencing it.
      i. A visual perception track enables us “to think about the world”—to recognize things and to plan future actions.
      ii. A visual action track guides our moment-to-moment movements.
   g. Directed Consciousness - awareness toward a single focus
   h. Flowing Consciousness - Drifting or unfocused consciousness
   i. Divided Consciousness - splitting of two conscious activities that occur simultaneously
   j. Selective Attention  the focusing of conscious awareness on a particular stimulus.
   k. Inattentional blindness  failing to see visible objects when our attention is directed elsewhere.
   l. Change Blindness – focusing attention to not notice any changes in our environment.

2. EEG Brain Waves
   a. **Alpha**: 8 - 12/sec., found in relaxed state, used during Biofeedback training.
   b. **Beta**: 13 -14/sec., dominates when mentally aroused.
   c. **Theta**: 4 - 8/sec., increase with drowsiness, slipping off to sleep.
   d. **Delta**: at lowest mental arousal, dreamless state of sleep.

3. **Circadian Rhythm** - Our bodies roughly synchronize with the 24-hour cycle of day and night by an internal biological clock
   a. Jet Lag an example of the biological clock not being reset after you travel between time zones. You body is telling you to sleep while the sun has just risen.
   b. Sleeping in on weekends causes the “Monday Blues” because your body thinks you should still be in bed and not getting up for an early class.
   c. Related to setting rhythms of sleep and wake, exposure to early morning sun can help reset clock. Also used to treat Seasonal Affective Disorder. Turning down lights before be also help to prepare for sleep.
   d. Light disrupts our 24-hour biological clock. Bright light affects our sleepiness by activating light-sensitive retinal proteins. This signals the brain’s suprachiasmatic nucleus (SCN) to decrease production of melatonin, a sleep-inducing hormone.
4. Sleep

a. Pre-sleep or "hypnagogic state" at this threshold of sleep we first begin to drift off to sleep, if we held a pencil it may drop. Body activity begins to drop off, often alpha waves appear causing that sudden jerk called "Myoclonia."

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<thead>
<tr>
<th>Awake, attentive</th>
<th>1 second</th>
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<tr>
<td></td>
<td><img src="image" alt="Beta waves" /></td>
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(a)

<table>
<thead>
<tr>
<th>Awake, nonattentive</th>
<th>1 second</th>
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<tr>
<td><img src="image" alt="Alpha waves" /></td>
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b. NREM-1
   i. 1 - 7 minutes. You lose awareness of surroundings. If aroused form this state, you subjectively feel you were awake. Theta waves are present.

c. NREM-2:
   i. Person is asleep, thoughts are fragmented, the EEG shows a burst of brain activity measured by "Spindles" and peaks called "K complexes"
   ![Spindles](image)

   ii. Eyes may roll side by side or be still, not REM. This stage lasts 5-10 minutes.

d. NREM-3 Delta Sleep
   i. After 30 minute, Stage 4 DEEP sleep. Delta - Deepest and hardest to waken.
   ii. It is the point where it is most difficult to wake you.
iii. After a few minutes to an hour in Delta, may return to stage 2.

5. **REM** period.
   a. Dreaming occurs in REM.
   b. 1st REM about 10 minutes, and cycle begins at stage 2 again.
   c. Repeats itself about every 90 min.
   d. Little danger from interrupting REM Sleep, will usually see **REM rebound** later if one has inadequate sleep. (Increased REM)
6. Sleep and Sleep Disorders
   a. Average need for sleep is 7 1/2 hours. 95% of people sleep 6 1/2 to 8 1/2 hours.
   b. Little effect between people and length of sleep they receive.
   c. Insomnia
      i. Sleep usually occurs 15 - 30 minutes after falling asleep involves Reticular Formation and changes in body temperature, and secretion of body chemicals.
      ii. Specific chemicals neurotransmitters present during onset, sleep and awakening, (serotonin, adrenalin)
      iii. Caused by anxiety, illness or change in circadian rhythm.
      iv. Drugs interfere with neurotransmitters in blood, i.e. barbiturates reduce REM sleep periods.
      v. 20 - 30% of general population suffer from insomnia. Higher numbers of Elderly, woman, and lower SES individuals.
      vi. The risk from insomnia can be physical, or social.
      vii. Classification of insomnia:
           1. Transient - from changes in stress, normal cycle, medical condition, or age.
           2. Chronic - Usually before 40, from history of problems, low self esteem, anxiety, also current psychological problems when people tend to internalize their emotions.

7. Treatment
   a. General Measures
      i. Improve Environment - Expect an "adaptation effect" in new environment, reduce disruptive stimuli like noise and light, etc.
      ii. Regular Schedules - Develop flexible routine of waking and retiring, relax before bed, sleep when tired, don't oversleep.
      iii. Sleep Full Amount - Regularity important, don't force it
      iv. Exercise Regularly
      v. Manage Stress - Improve coping skills, learn cues and association between stressful events, emotions and sleep, learn relaxation or imagery.
      vi. Avoid Drug Induced Sleep - Reduce caffeine and Tobacco, recognize alcohol causes fragmentation of sleep (REM), stimulants and other medications also affect sleep, same after drug withdrawal.

8. Dreams
   a. We dream in color and/or Black & White
b. We dream of many things usually others, or of everyday experiences, little sexual etc. (Call this "day residue")
c. We dream from both sides of brain, thought maybe only right side but proven not true from research with split brain patients. Used verbal reports, REM and EEG readings.
d. Can increase awareness with recordings or immediate writing of them to a note pad.
e. 1st dream is about 10 minutes, they increase length over time last one is about 60 minutes.
f. They must be close to REM to remember them.

9. Theories of Dreaming
a. **Freud** - Road to unconscious, symbolic representations of wishes and fears we cannot express in consciousness.
   i. **Manifest Content** - obvious but superficial meaning of dreams
   ii. **Latent Content** - true meaning of dreams
b. **Activation Synthesis** - Hobson and McCarley
   i. Dreams are interruptions of sleep, we find in the lab a surge of electrical impulses from larger neurons in the pons. These extend into nearby areas of the brain which control eye movement and motor activity.
   ii. They are active during REM, suggest brain attempts to make sense out of brain activity and bodily changes.
   iii. Dreams are the result of the thinking brain reacting to messages of older brain. The REM experience is not scanning a dream, but explained as brain reacting or trying to make sense out of REM itself.
   iv. Example of explanations of a Falling Sensation -
      1. Freud - Failure
      2. Activation - muscle tension

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<tr>
<th>Theory</th>
<th>Explanation</th>
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<td>Freud's wish-fulfillment</td>
<td>Dreams provide a &quot;psychic safety valve&quot;—expressing otherwise unacceptable feelings; contain manifest (remembered) context and a deeper layer of latent content (a hidden meaning).</td>
<td>Lacks any scientific support in many different studies</td>
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<td>Information-processing</td>
<td>Dreams help us sort out the day's events and consolidate our memories.</td>
<td>But why do we sometimes have dreams?</td>
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<td>Physiological function</td>
<td>Regular brain stimulation from REM sleep may help develop and preserve neural pathways.</td>
<td>This does not explain why we dream.</td>
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<td>Neural activation</td>
<td>REM sleep triggers neural activity that evokes random visual memories, which our sleeping brain weaves into stories.</td>
<td>The individual's brain does not tell us something about dreams.</td>
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<td>Cognitive development</td>
<td>Dream content reflects dreamers' cognitive development—their knowledge and understanding.</td>
<td>Does not address the new theories of dreaming.</td>
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10. **Night Terrors**
   a. Take place in children during Non-REM Delta sleep, involve terror and movement, no memory remains in morning.
   b. Adults experience nightmares during REM sleep.

11. **Hypnotism** (Hypnos = "Sleep")
   a. Some reference to early use by Greeks and Egyptians to treat various illnesses.
   b. Messmer - 1700's, most documented beginning of its use.
   c. "Group Suggestion" effect, put forces back in balance, due to BELIEF
      i. Called Mesmerism

12. **Hypnotism: Behaviors and Uses**
   a. Imagined Perceptions or Hallucinations
   b. Test with giving subject suggestions affecting senses
   c. Stanford Hypnotic Susceptibility Scale
   d. 75-80% of population may be hypnotized to some extent
i. 15% deeply
ii. 10% have little capacity to be hypnotized

e. Pain Control or Hypnotic Analgesia
   i. Hilgard & Hilgard used it to alter chronic pain in patients who are no longer
   under treatment for pain. Two types -
   ii. Phantom - pain from area or limb which is no longer there.
   iii. Referred - chronic pain from injury to an area which is felt elsewhere.

f. Hypnosis gives direct suggestion of no pain, numbness, movement of pain, or change in
   the pain itself.

g. No sensation of pain in presence of painful stimuli under hypnosis Is Analgesia.

h. Hilgard says a part of the person he calls the hidden observer is aware of pain but in
   background.

13. Age Regression
   a. To remember and relive past experiences.
   b. Sometimes subjects do what adults do which shows they do not really think like or
   become children again, they just act it out.
   c. Outcome depends on the type of instruction given before hypnosis, (+) or (-) expectations
   of effect.

14. Post Hypnotic Amnesia -
   a. Selectively forgetting unpleasant experiences or memories after hypnotic suggestion.
   b. Some believe thoughts have been made unavailable to normal consciousness.
   c. Others believe have not been properly encoded into LTM.

15. Post Hypnotic Suggestions or Hypnotic Control
   a. Goal to control specific behavior after suggestion.
   b. Effects with subjects who attempt to change behaviors which there are not motivated to
   change has little success, when used on behaviors where subjects have strong motivations
   to change better success.

16. Is Hypnotism an Unique State?
   a. 3 Characteristics Present
      i. Selective Attention
      ii. Increased Suggestibility
      iii. Special Consciousness
   b. Example - Research with 3 groups of Subjects given different instructions:
      i. A - Told only will be given test of imagination following suggestions.
      ii. B - Are hypnotized and informed will have unusual experience
      iii. C - Told will be tested for ability to imagine and are also asked to try to score as
      high as possible
      iv. Given suggestions similar to susceptibility scales, A's were least open to
      suggestions, B's did more suggestions then A's, and C's did just as good as the
      Hypnotized B's.
      v. Demonstrates behaviors under hypnosis are similar to those performed under
      motivational instructions.
17. Other Clinical Uses of Hypnosis
   a. Treatment of Phobias
   b. Treatment of anxiety
   c. Sexual Dysfunction
   d. Personal Improvement

18. Summary of Theories of Hypnosis
   a. No such thing as hypnotic trance, just conditions similar to relaxation, responding to individual differences.
   b. Subjects often role play, act as they should or are expected to.
   c. Parallel Processing - or hidden observer, aware of 2 sets of stimuli at once. (control-of-pain as pain is still present)
   d. Changed Consciousness which leads to an altered state.

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<td>Hypnosis</td>
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<td>Posthypnotic Suggestion</td>
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