Consciousness: Focus on Awareness
Consciousness: Focus on Awareness
The nature of consciousness

- It is a private subjective experience, and one that can change so dramatically—from one moment to the next.
- Why should psychologists care about consciousness?
- Our sense of the world and ourselves emerges from consciousness.
The nature of consciousness

- Consciousness refers to our ongoing awareness of our own thoughts, sensations, feeling – our very existence.
- A full understand of what it is to be a person requires that we understand consciousness.
Functions of consciousness

- That consciousness plays a key role in allowing us to bring information together in novel ways.
- Other researchers argue that consciousness serves to bind our enormously complex perceptual and mental process into a single coherent whole.
Functions of consciousness

意識的功能

- Consciousness lets us know whether perceptual and mental processes are fitting together correctly. 正確地湊合在一起
- Consciousness plays a key role in self-awareness 自我覺察, which in turn can help us control our emotions. 控制情緒
Altered states of consciousness

Waking consciousness.

These altered states of consciousness (ASC) may be natural states, such as sleeping, dreaming, hypnosis, and meditation, or they may be induced by substances such as drugs and alcohol.
Altered states of consciousness

In many cultures, inducing and altered state of consciousness is a socially acceptable, and sometimes even mandated, ritual.
Stages of sleep: working through the night

- Sleep is perhaps the most obvious example of an altered state of consciousness.
- In five stages during the night.
- Everyone proceeds through these stages, but people differ in how much time they spend in each stage.
Stages of Sleep

- EEG-based measurements
- Stage 1
  - Hypnogogic
- Stage 2
  - Sleep spindles
- Stages 3 and 4
  - Delta waves
- REM (rapid eye movement) sleep
Stage 1

- Lasting approximately 5 minutes, marks the transition from relaxed wakefulness to sleep. 從相當輕鬆清醒狀態進入睡眠
Stage 2

- Once you are clearly asleep, your EEG pattern begins to record sleep spindles—brief bursts of brain activity.
Stage 3 and 4

- Stage 3 and 4 are sometimes referred to collectively as slow-wave sleep (SWS) because your brain produces delta waves.
- In stage 3, 20-50% of EEG recorded brain activity is in the form of delta waves; in stage 4, the proportion is greater than 50%.
REM sleep 快速動眼睡眠

- Rapid eye movement (REM)
- It is in this stage of sleep that you are likely to have dreams vivid enough to remember.
- During REM sleep, your breathing and heart rate are fast and irregular.
REM sleep 快速動眼睡眠

- During REM sleep, your muscles are relaxed and unresponsive; in fact, your voluntary muscles are so paralyzed that you could not physically enact the behaviors in your dreams.

- However, your involuntary muscles continue to move.
Stages of Sleep
Sleep cycles

- Each cycle takes about 90 minutes and occurs four or five times each night.
- With slow-wave sleep occurring predominantly in the early hours of sleep and REM sleep occurring primarily in the later hours of sleep.
REM rebound 反彈

- When you don’t get enough REM sleep on a given night, a higher percentage of the next night’s sleep will be REM sleep; this phenomenon is called REM rebound.
REM rebound 反彈

- REM rebound dreams can be so vivid, bizarre, and generally unpleasant that people resume using the substances to fall asleep, and to suppress dreaming as well.
Sleep deprivation: what happens when you skimp on sleep?

- After 3 nights of restricted sleep, volunteers complained of cognitive, physical, and emotional difficulties.
Attention and performance drop

- Cognitive and physical difficulties that result from sleep deprivation involve problems in sustaining attention and in performing visual-motor tasks.
Emotions flare

- Those who sleep less than 6 hours report being inpatient or aggravated when faced with common minor frustrations such as being stuck in traffic or having to wait in line, and they are more dissatisfied with life in general.
The body suffers

- Sleep deprivation can lead to a change in cortisol level that, in turn, alters other biological functions, such as decreasing immune system functional and creating an increased risk for diabetes.
Learning decreases

- With deficits in learning
- Memory deficits
Sleep Deprivation

- 2/3 adults are not getting enough sleep
- REM rebound
- Effects
  - Attention
    - Sustained attention
  - Physical performance
    - Visual-motor tasks
  - Mood
  - The body suffers
    - Increased cortisol
  - Decreased learning
The Function of Sleep

- Why do we sleep?
  - Evolutionary theory
  - Restorative theory
  - Facilitating learning
Evolutionary theory

- One theory of the function of sleep is that it provided an evolutionary advantage—it kept our ancestors metaphorically off the streets and out of trouble.

- Sleeping removes us from potential life-threatening conflicts with predatory animals at night, when humans do not have the advantage of night vision.
Evolutionary theory 進化論

- That sleep allows energy conservation 保留能量 because the body’s temperature 體溫 lowers and caloric demands decline.
Restorative theory

- Sleep helps the body repair the wear and tear from the day’s events.
Facilitating learning

- That it facilitates the learning of material encountered during the day.
- Sleep is critical in laying down memories associated with perceptual and motor learning.
Dream on

- It is not true that dreams take place only during REM sleep, but it is true that the dreams, that take place during REM sleep are more memorable than those occurring during non-REM (NREM) stages.
- Dreams 78% of the time.
- NREM dreams are less vivid, less storylike, and less emotional.
What triggers particular dreams?

- Researchers have learned that certain types of dreams appear to be related to events occurring during the day.
- Dreams may also provided an opportunity to solve personal problems.
Why do we dream?

- Dreams can offer us a pleasant respite from the daily.
Dreaming

- What triggers particular dreams?
- Why do we dream?
- Freud
  - Wish fulfillment
  - Manifest content
  - Latent content
- Activation-synthesis hypothesis
- Editing neural connections
- Strengthening neural connections
- Goals and arousal
Activation-synthesis hypothesis

- Activation-synthesis hypothesis, which contends that dreams arise from random bursts of nerve cell activity.
- The brain synthesizes the sensory images and activates stored information to create the experience of a dream.
- Explain why dreams sometimes seem so bizarre and unrelated.
Editing versus strengthening neural connections

- That dreams are used to strengthen useful connections.
- REM sleep is crucial for cementing in memory certain kinds of information gleaned during the day.
Editing versus strengthening neural connections

- Such memories do not absolutely depend on REM.
- REM sleep is particularly important for perceptual memories, and slow–wave sleep is important for other sorts of memory, but at present this remains an area for further research.
Goals/desires and arousal/inhibition

- Solms found that dreaming was affected by damage to any number of brain areas.
- Dreaming stopped completely if a patient had damage that disconnected parts of the frontal cortex from the brainstem and the limbic system.
Goals/desires and arousal/inhibition

- Alternatively, the damage that disconnected frontal cortex from brainstem and limbic system may have disrupted the brain’s storage and integration of memories related to needs, goals, and desires.
Goals/desires and arousal/inhibition

- Why we dream, we do know something about how we dream.
- We know that dreaming is a neurological process, involving brain activity.
- Interesting that all of these theories, despite their differences, agree that in some way the day’s events, or the neural connections they instigate, affect dreams.
Sleep disorders

- **Night terrors**
  Vivid, frightening experiences; the dreamer cannot be woken and does not remember the terrors.

- **Nightmares**
  Dreams with negative emotion; they may be remembered the next day.
Sleep disorders

- Narcolepsy
  sudden attacks of extreme drowsiness and possibly sleep.

- Insomnia
  Difficulty getting to sleep, difficulty staying asleep, or awakening too early.
Sleep disorders

Sleep apnea

brief, temporary cessation of breathing during sleep for up to 70 seconds, following a period of difficult breathing accompanied by snoring; the sleeper then startles into a lighter state of sleep and may have no memory of these events and may not feel rested after sleeping.
Hypnosis is characterized by a focused awareness on vivid, imagined experiences and a decreased awareness of the external environment.

Hypnotic induction, a process in which the participant is encouraged to relax and focus his or her awareness in a particular way, often with closed eyes.
What is hypnosis?

- Trance state, an altered state of consciousness in which your awareness of the external environment is diminished.
- Two hallmarks of a trance state.
- One is generalized reality orientation fading.
What is hypnosis?

- The operation of trance logic, an uncritical acceptance of incongruous, illogical events, without being distracted by their impossibility.
- Because of your expectations of the hypnotic situation.
- Also give you a posthypnotic suggestion, a suggestion for specific changes in perception, mood, or behavior that will occur after you leave the hypnotic.
Individual differences: who is hypnotizable?

- In western cultures, hypnotizability appears to peak before adolescence and decline during the middle adulthood years.
- Shyness, emotionality, or thrill seeking.
- Absorption, or the capacity to concentrate totally on material outside oneself, is moderately correlated with hypnotizability.
Individual differences: who is hypnotizable?

- Hypnosis also appears to be modestly related to openness to experience, a willingness to experience new things.
Trance theory

- According to trance theory, someone in a trance state due to hypnosis in fact experience an altered state of consciousness, one characterized by increased susceptibility and responsiveness to suggestions.
Trance theory

- As a result, the person is dissociated, or separated, from his or her normal level of awareness.
- This “inner” experience has been attributed to the hidden observer, a part of the self that experiences what the entranced part of the self does not consciously experience.
Sociocognitive theory

- Sociocognitive theory focuses on the social context in which hypnosis takes place and the motivation to attend and respond to the suggestions of the hypnotist.
Sociocognitive theory

- The person in a trance enacts the role of a hypnotized person as he or she understands it, which leads to behaviors and experiences believed to be produced by hypnosis.

- Thus, volunteers who are appropriately motivated can perform hypnotic feats even if they are not hypnotized.
Evidence from neuroimaging

- Clearly, hypnosis is not simply role playing or motivated behavior; people cannot intentionally alter brain processing in these particular ways.

- However, research has yet to uncover biological changes that are specific to hypnosis that occur during all of the different types of tasks performed while in trance.
Hypnosis as a tool: practical applications

- The treatment of anxiety, compulsive habit behaviors, certain medical conditions, and stress-related problems.
- Hypnosis has even been used to treat a particular complication during pregnancy.
- Hypnosis was used for the relief of pain.
- Hypnosis is a particularly good way to affect this processing.
Hypnosis as a tool: practical applications

- Hypnosis is also used to induce relaxation before surgery, to lessen pain, and to speed healing.
- Hypnosis is used for pain control in many circumstances today – in the dentist’s chair, the operating room, during childbirth, and at home and work.
- Hypnosis also provides an opportunity for mental practice of athletic skills, a known benefit.
Types of meditation

- Meditation is an altered state of consciousness characterized by a sense of deep relaxation and loss of self-awareness, which is characterized by ongoing self-awareness.

- In meditation, the stimulus can be an object in the environment, a rhythmic physical motion of the body, or a mantra.
Types of meditation

- The meditator focuses attention on a single stimulus during the meditation period with the goal of clearing his or her awareness of other thoughts and sensations.

- Meditators sometimes experience a “relaxed, blissful, and wakeful state.”
Benefits of meditation

- Reduce tension and anxiety
- Decrease levels of stress
- Lower anxiety in patients preparing for surgery
- Decrease cardiac measures such as blood pressure
- Facilitate treatment for the skin condition psoriasis
- Increase the body’s ability to fight infection
Meditation and the body: more than pause that refreshes

- One of the documented benefits of meditation is that it quickly induces a state of deep restfulness
Meditation versus relaxation

- In sum, many, though not all, studies have shown that meditation alters heart rate, respiration rate, and arousal more effectively than does relaxation training.
- Studies have also shown that, compared with other forms of relaxation, meditation appears to provide an enhanced experience of relaxation.
Drugs and alcohol

- They can alter our perceptions, mood, thoughts, and behavior.
- But it’s also possible to alter consciousness through external means, with the use of various psychoactive substances.
- These substances, which can be ingested, injected, or inhaled, affect the user’s thoughts, feelings, and behaviors.
Categories of Drugs

- **Depressants** 中樞神經鎮靜劑（酒）
- **Opiates** /Narcotics 麻醉藥 （Codeine, heroin 海洛因, morphine 嗎啡）
- **Stimulants** 提神劑（Amphetamines, cocaine)
- **Hallucinogens** 迷幻藥 LSD,PCP 天使塵
- **Cannabis** （大麻煙）
Substance use and abuse

Three main criteria for substance abuse

1. A pattern of substance use that leads to significant distress or difficulty functioning in major areas of life.
2. Substance use that occurs in dangerous situations.
3. Substance use that leads to legal difficulties.
Substance use and abuse

- Substance dependence results from chronic abuse.
- Tolerance is the condition, resulting from repeated use, in which the same amount of a substance produces a diminished effect.
Substance use and abuse

- Withdrawal symptoms are the uncomfortable or life-threatening effects that may be experienced during withdrawal.
Psychoactive Substances

- Depressants
  - Alcohol, barbiturates
- Stimulants
  - Cocaine, amphetamines
- Narcotic analgesics
  - Heroin
- Hallucinogens
  - LSD, marijuana
Summary of the psychological effects of alcohol

Alcohol use can lead to

- Difficulties in abstract thinking
- Impaired ability to conceptualize information
- Problems noticing situational cues
- Poor processing of ambiguous social situation
- Inhibitory conflict
- Alcohol myopia
- Increased aggression
Iv. Drug and alcohol

- Chronic substance abuse leads to substance dependence, whose main characteristics are tolerance and withdrawal.
Depressants such as alcohol depress the central nervous system and can create an altered state of consciousness through disinhibition, decreased awareness, and an increased sense of relaxation. Disinhibition may make it difficult for the user to inhibit (or stop) behaviors in high-conflict situations that he or she would otherwise be able to prevent, and thus alcohol can promote aggressive behavior.
Iv. Drug and alcohol

- Chronic alcohol abuse can lead to blackouts, as well as tolerance and withdrawal symptoms.
- Stimulants excite the central nervous system, leading to increase in behavioral activity, heightened arousal, perceptions of increased physical and mental energy, diminished hunger, and a sense of invulnerability.
Iv. Drug and alcohol

- The user of a stimulant will “crash” after the drug wears off, become depressed and irritable, and crave more of the drug. Chronic use of some stimulants (such as amphetamines and cocaine) can cause paranoia and violent behavior.
Iv. Drug and alcohol

- Narcotics such as heroin act as analgesics and also produce a sense of euphoria and relaxation; they are central nervous system depressants.

- Users of narcotics experience tolerance and extremely uncomfortable withdrawal symptoms; chronic use of a narcotic can suppress the body’s production of endorphins.
Iv. Drug and alcohol

- Even moderate doses of hallucinogen (except marijuana) can cause visual hallucinations and perceptual alterations of other senses.
- The altered state of consciousness produced by a hallucinogen is influenced by the user’s mood and expectations. Marijuana user may experienced euphoria and relaxation. Flashbacks can occur after LSD use.