Drive States

Instructor Manual

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In this module, *Drive States*, the authors provide an overview of key drive states, including information about their neurobiology and their psychological effects.

Learning Objectives

- Relevant APA Learning Objectives (Version 2.0)
    - Describe key concepts, principles, and overarching themes in psychology (1.1)
    - Develop a working knowledge of psychology's content domains (1.2)
    - Describe applications of psychology (1.3)
    - Engage in innovative and integrative thinking and problem solving (2.3)
    - Apply psychological content and skills to career goals (5.1)
    - Exhibit self-efficacy and self-regulation (5.2)
    - Refine project-management skills (5.3)
    - Develop meaningful professional direction for life after graduation (5.5)
- Content Specific Learning Objectives: Drive States
    - Identify the key properties of drive states.
    - Describe biological goals accomplished by drive states.
    - Give examples of drive states.
    - Outline the neurobiological basis of drive states such as hunger and arousal.

- Discuss the main moderators and determinants of drive states such as hunger and arousal.

Abstract

Our thoughts and behaviors are strongly influenced by affective experiences known as drive states. These drive states motivate us to fulfill goals that are beneficial to our survival and reproduction. This module provides an overview of key drive states, including information about their neurobiology and their psychological effects.

Class Design Recommendations

This module can be taught in a single class period or less, with the unit as a whole taking 1-2 class periods. Please also refer to the Noba PowerPoint slides that compliment this outline.

1st class period (35 min – 50 min):

- Introduce Motivation
  - Drive States
- Key Properties of Drive States
  - Homeostasis
  - Narrowing of Attention
- Examples of drive states
  - Hunger
  - Arousal

Module Outline

Introduction

- A drive state is an affective experience that motivates organisms to fulfill goals that are generally beneficial to their survival and reproduction. For example, drive states like hunger or sexual arousal can have a profound impact on the functioning of the mind.

Key Properties of Drive States:

- Homeostasis is the tendency of an organism to maintain this stability across all the different physiological systems in the body. Homeostasis consists of two main ingredients. First, the state of the system being regulated must be monitored and compared to an ideal level, or a set point. Second, there need to be mechanisms for moving the system back to this set point, that is, to restore homeostasis, when deviations from it are detected. Most homeostatic mechanisms are automatic and non-conscious (e.g., blood circulation), though some involve deliberate action (e.g., hunger).
- The Narrowing of Attention refers to the process of when drive states intensify, they direct attention toward elements, activities, and forms of consumption that satisfy the biological need associated with the drive. Drive states also produce a second form of attention narrowing: a collapsing of time-perspective toward the present. A third form of attention-narrowing involves thoughts and outcomes related to the self versus others. Intense drive states tend to narrow one's focus inwardly and to undermine altruism.

Two Illustrative drive states

- Hunger is a paradigmatic drive state that results in thoughts and behaviors related to the consumption of food. Hunger is generally triggered by low glucose levels in the blood, behaviors resulting from hunger aim to restore homeostasis regarding glucose and its presence in the body. Various other internal and external cues can also cause hunger.
    - The hypothalamus plays a very important role in eating behavior. The lateral hypothalamus (LH) is concerned largely with hunger.
    - Hunger is only part of the story of when/why we eat. An analogous process, satiation, relates to the decline of hunger and the termination of eating behavior.
    - Hunger and satiation are two distinct processes, controlled by different circuits in the

brain and triggered by different cues. The ventromedial hypothalamus (VMH) plays an important role in satiety.

- Other brain areas, besides the LH and VMH, also play important roles in eating behavior. The sensory cortices (visual, olfactory, and taste), for example, are important in identifying food items.
- After identifying a food item, the brain also needs to determine its reward value, which affects the organism's motivation to consume the food.

- Sexual arousal results in thoughts and behaviors related to sexual activity. As with hunger, it is generated by a large range of internal and external mechanisms that are triggered either after the extended absence of sexual activity or by the immediate presence and possibility of sexual activity. These mechanisms can differ substantially between males and females.

  - Sexual arousal and pleasure in males is strongly related to the preoptic area, a region in the anterior hypothalamus.
  - For female behavior, the ventromedial hypothalamus plays a similar role. Neurons in the ventromedial hypothalamus determine the excretion of estradiol, an estrogen hormone that regulates sexual receptivity.
  - Other differences between males and females involve overlapping functions of neural modules that often provide clues about biological roles played by sexual arousal and sexual activity in males and females.
  - One region of the brain that seems to play an important role in sexual pleasure, for both males and females, is the septal nucleus, an area receiving reciprocal connections from many other brain regions, including the hypothalamus and the amygdala.

Conclusion

- Drive states are evolved motivational mechanisms designed to ensure that organisms take self-beneficial actions. In this module, we have reviewed key properties of drive states, such as homeostasis and the narrowing of attention. We have also discussed, in detail, two important drive states—hunger and sexual arousal—and explored their underlying neurobiology and the ways in which various environmental and biological factors affect their properties.

Difficult Terms

Drive State
Homeostasis
Homeostatic set point
Hypothalamus
Lordosis behavior
Preoptic area
Reward Value

Lecture Frameworks

Overview

The motivation modules can be fun to teach because they are very relevant to student lives, especially the illustrative drive states of hunger and arousal.

First Class Period

- Discussion/Warm-Up:
    - Like with other lectures, it might be helpful to start out with a question. You can ask students to reflect on specific instances of hunger or pain that dominated their attention and affected their motivation. This is a nice opportunity to set the stage for key points of learning that will follow such as “narrowing of attention” and “homeostasis”
    - The lecture gets formally underway with a focus on the concept of homeostasis. Here you can explain what drive states are and their key properties (i.e., homeostasis and the narrowing of attention). One way you might consider talking about homeostasis is like a thermostat – we like our house to be at a comfortable temperature (set point); when it gets too hot or too cold, we become motivated to take action (put on a sweater, get a blanket, turn on a fan, etc.). This gives students an easy to grasp example of what homeostasis means. Once you’ve laid the foundation of drive states, you can use hunger and sexual arousal as specific examples/applications.
- Lecture – Refer to slides for the following:

- To discuss Narrowing of Attention

- Activity: Intrinsic vs. Extrinsic Motivation
  - Introduces intrinsic vs. extrinsic cues/motivations. See Activities/Demonstrations (below) for instructions.
- Lecture – Refer to slides for the following:
  - To discuss Hunger & Sexual Arousal
    - Now that you have set up the foundation, you can use hunger and sexual arousal to illustrate drive states. This module takes a very biological approach to explaining hunger and sexual arousal, so consider including social and psychological influences as well (as we often preach to students – behavior is a complex intersection of biological, psychological, and social factors).
    - If you subscribe to the bio-psycho-social model (BPS), make sure you define and describe how each approach influences an individual's motivation, as well as providing examples. For hunger, you could use the *biological* influences mentioned in the module, the *psychological* components to satiation, and the *social* context of food (e.g., a cultural emphasis on thinness may motivate some individuals to avoid food; the cultural norm of "super sizes" may motivate others to over indulge or to eat past feelings of satiety). You could use a similar approach for sexual arousal.

Activities & Demonstrations

In-Class Activity: Intrinsic vs. Extrinsic Motivation

This in-class mini-writing is designed to help students understand the different types of motivation (intrinsic vs. extrinsic).

- Time: Less than 10-15 minutes
- Materials: Link to motivation clip, Students need pen and paper

- Directions:
    - When you get to intrinsic and extrinsic motivation during the lecture, show students the following clip: Terry Tate, office linebacker (https://www.youtube.com/watch?v=RzToNo7A-94)
    - Note: this clip does contain some swearing. If that does not appeal to you, you can do this activity with another clip (though students tend to enjoy this video).
    - After the clip, have students respond with a mini-writing exercise:

Example prompts:

- What type of motivation were the workers displaying in the video?
- What could the CEO have done to promote intrinsic motivation?
- Which do you think is more strongly related to positive outcomes, intrinsic or extrinsic motivation? Why might extrinsic motivation be less effective in the long run?
- Follow-up Discussion: ask students to share their thoughts about the types of motivation seen in the video.

Additional Activities

Reiss, S. (2012). Intrinsic and extrinsic motivation. *Teaching of Psychology*, 39(2), 152-156. doi:10.1177/0098628312437704

- Psychologists have posited two types of motivation theories. Dualistic theories divide motivation into two types: intrinsic and extrinsic. Multifaceted theories, in contrast, recognize a number of genetically distinct motives. Intrinsic-extrinsic dualism fails on at least three counts: construct validity, measurement reliability, and experimental control. Many researchers have thus moved beyond the study of intrinsic-extrinsic motivation and validated multifaceted theories. When teaching students about the multifaceted nature of motivation, teachers can take several steps to improve their students' understanding of this understudied area of psychology.

Outside Resources

Web: An open textbook chapter on homeostasis
http://en.wikibooks.org/wiki/Human_Physiology/Homeostasis

Web: Motivation and emotion in psychology
http://allpsych.com/psychology101/motivation_emotion.html

Web: The science of sexual arousal
http://www.apa.org/monitor/apr03/arousal.aspx

Suggestions from the Society for Teaching's Introductory Psychology Primer

Bequette, A.W. (2013). Health, Emotion, & Motivation. In S.E. Afful, J. J. Good, J. Keeley, S. Leder, & J. J. Stiegler-Balfour (Eds.). *Introductory Psychology teaching primer: A guide for new teachers of Psych 101*. Retrieved from the Society for the Teaching of Psychology web site: http://teachpsych.org/ebooks/intro2013/index.php

POSSIBLE ASSESSMENTS (Out of Class)

Emotion

- Have students review three emotion theories (James-Lange, Cannon-Bard, and Two- Factor) and compare/contrast. Students can also choose which theory they think is the most accurate and describe why.

Emotion/Motivation

- Have students write a discussion paper describing how their emotions affect their drive. For example, students will likely to acknowledge that doing well in school results in positive emotions. This likely motivates them to study. Students can brainstorm other examples and describe how their emotions affect their motivation and drive.

ACTIVITIES & TECHNIQUES (In Class)

Emotion

- Engage students in a discussion regarding how emotions can affect their health and wellness. For example, negative emotions are related to stress which negatively impacts health.

Motivation

- Have a class discussion about intrinsic and extrinsic motivation. Ask students to discuss what motivates them to do well in school and how both intrinsic and extrinsic motivation applies. This is also an appropriate time to review operant conditioning and its relationship to motivation.

Links to ToPIX Materials

Activities, demonstrations, handouts, etc.: Emotion
http://topix.teachpsych.org/w/page/19980989/Emotion%20in%20the%20Classroom

Activities, demonstrations, handouts, etc.: Motivation
http://topix.teachpsych.org/w/page/19981020/Motivation%20in%20the%20Classroom

Current events/ news: Emotion
http://topix.teachpsych.org/w/page/24993705/Emotion%20in%20the%20News

Current events/ news: Motivation
http://topix.teachpsych.org/w/page/24883789/Motivation%20in%20the%20News

Video/audio: Emotion
http://topix.teachpsych.org/w/page/19980988/Emotion%20Video

Video/audio: Motivation-Emotion
http://topix.teachpsych.org/w/page/39235435/Motivation-Emotion

Teaching Topics

Teaching The Most Important Course
https://nobaproject.com/documents/1_Teaching_The_Most_Important_Course.pdf

Content Coverage
https://nobaproject.com/documents/2_Content_Coverage.pdf

Motivating Students
https://nobaproject.com/documents/3_Motivating_Students_Tips.pdf

Engaging Large Classes
https://nobaproject.com/documents/4_Engaging_Large_Classes.pdf

Assessment Learning
https://nobaproject.com/documents/5_Assessment_Learning.pdf

Teaching Biological Psychology
https://nobaproject.com/documents/6_Teaching_Bio_Psych.pdf

PowerPoint Presentation

This module has an associated PowerPoint presentation. Download it at https://nobaproject.com//images/shared/supplement_editions/000/000/272/Drive%20States.ppt?1416598794.

About Noba

The Diener Education Fund (DEF) is a non-profit organization founded with the mission of re-inventing higher education to serve the changing needs of students and professors. The initial focus of the DEF is on making information, especially of the type found in textbooks, widely available to people of all backgrounds. This mission is embodied in the Noba project.

Noba is an open and free online platform that provides high-quality, flexibly structured textbooks and educational materials. The goals of Noba are three-fold:

- To reduce financial burden on students by providing access to free educational content
- To provide instructors with a platform to customize educational content to better suit their curriculum
- To present material written by a collection of experts and authorities in the field

The Diener Education Fund is co-founded by Drs. Ed and Carol Diener. Ed is the Joseph Smiley Distinguished Professor of Psychology (Emeritus) at the University of Illinois. Carol Diener is the former director of the Mental Health Worker and the Juvenile Justice Programs at the University of Illinois. Both Ed and Carol are award- winning university teachers.

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