# **Undergraduate Distance Education Review Form**

(Required for all courses taught by distance education for more than one-third of teaching contact hours.)

# **Existing and Special Topics Course**

Course: PSYC 356

Biopsychology

Instructor(s) of Record: Raymond Pavloski

Phone: 357-7912

Email: pavloski@iup.edu

Step One: Proposer

A. Provide a brief narrative rationale for each of the items, A1- A5.

- 1. How is/are the instructor(s) qualified in the distance education delivery method as well as the discipline? I have supplemented my classroom lectures with audio and visual materials since the technology for doing so became available at IUP. I have used the project directory service to make available power point slides, laboratory materials, and links to outside sources for students for many years. I completed all 4 WebCT workshop modules offered by the IRT lab from January 7-10, and have been using WebCT to supplement other materials for two sections of PSYC 359, Sensation and Perception, since the beginning of the current semester. In addition, one of my colleagues has kindly made me a guest on the WebCT site for a course that he has offered several times using distance educational technology, allowing me to benefit from his experience in meeting course objectives.
- 2. How will each objective in the course be met using distance education technologies?

Because of the highly visual nature of this course, distance education technology is very valuable. Information necessary for each of the following objectives is routinely presented using power point slides when the course is taught using a traditional classroom lecture format. Being able to present this material using distance education technology will benefit students, as it will allow students to study and to acquire the information at a pace that suits their backgrounds, learning speeds and styles, and schedule. Each semester that this course is offered in the classroom there are students who learn the material quickly and who could benefit from a faster pace, and there are students for whom the pace is too rapid.

- 1. Demonstrate a basic knowledge of the major structures of the nervous system, its interfaces with sensory and motor mechanisms, and its development.
- 2. Demonstrate a basic knowledge of the structure and function of cells of the nervous system.
- 3. Demonstrate familiarity with the noninvasive and invasive methods used to gain information about brainbehavior relationships.
- 5. Demonstrate knowledge of nervous system structures and processes involved in sensory, motor, emotional-motivational, and cognitive behaviors.

The following two objectives are typically assessed using appropriate question types on examinations, which include hard copies of relevant graphical materials. Distance education technology will permit the same type of assessments to be carried out.

- 4. Demonstrate knowledge of commonalities in brain mechanisms across species and how these can be understood as the products of natural selection.
- 6. Use the above information to analyze behavioral outcomes as interactions among processes and events at the level of the brain, the person, and the group.

Received

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- How will instructor-student and student-student, if applicable, interaction take place?
   Interactions will take place almost exclusively via email. In addition, I plan to make use of the discussion room facility on WebCT for reviewing materials that students typically find difficult and have questions about.
- 4. How will student achievement be evaluated? Traditional examinations, 6-10 short writing assignments exploring applications of course material, and queston sets for each textbook chapter and its corresponding online lectures will be used for evaluation of student progress.
- 5. How will academic honesty for tests and assignments be addressed?

  Each student will be asked to sign an academic honesty statement that precedes the questions on each examination. Students will be given adequate time to complete examinations, but not enough time to permit cheating by looking up answers. Each student will receive questions in a different order.
- B. Submit to the department or its curriculum committee the responses to items A1-A5, the current official syllabus of record, along with the instructor developed online version of the syllabus, and the sample lesson. This lesson should clearly demonstrate how the distance education instructional format adequately assists students to meet a course objective(s) using online or distance technology. It should relate to one concrete topic area indicated on the syllabus.

Step Two: Departmental/Dean Approval				
Recommendation:	Positive (The objectives of this course can be met via distance education)			
	Negative  Signature of Department Designee	2 (20 (0%) Date		
Endorsed:	Day Morril-	7-71-68		
	Signature of College Dean	Date		
Forward form and supporting materials to Liberal Studies Office for consideration by the University-wide Undergraduate Curriculum Committee. Dual-level courses also require review by the University-wide Graduat Committee for graduate-level section.				
Step Three: University	ty-wide Undergraduate Curriculum Committee	Approval		
Recommendation: Positive (The objectives of this course can be met via distance education)				
	Negative			
	Signature of Committee Co-Chair	Date		

Forward form and supporting materials to the Provost Wit	nin 30 calendar days after received by committee.
Step Four: Provost Approval	
Approved as distance education course	Rejected as distance education course
Signature of Provost	Date

Forward form and supporting materials to Associate Provost.

## a. Catalog Description

PSYC 356 Biopsychology

Prerequisite: PSYC 101

A study of the relationship between behavior and the anatomy and physiology of the nervous system. May not receive credit towards the Psychology major or minor for both PSYC 350 and 356.

## b. Course Outcomes

Students completing this course will be able to:

- 1. Demonstrate a basic knowledge of the major structures of the nervous system, its interfaces with sensory and motor mechanisms, and its development.
- 2. Demonstrate a basic knowledge of the structure and function of cells of the nervous system.
- 3. Demonstrate familiarity with the noninvasive and invasive methods used to gain information about brain-behavior relationships.
- 4. Demonstrate knowledge of commonalities in brain mechanisms across species and how these can be understood as the products of natural selection.
- 5. Demonstrate knowledge of nervous system structures and processes involved in sensory, motor, emotional-motivational, and cognitive behaviors.
- 6. Use the above information to analyze behavioral outcomes as interactions among processes and events at the level of the brain, the person, and the group.

# c. Basic Course Outline

Section Topics

- 1. Introduction to biopsychology. Anatomy of the nervous system. Neurons, glia, and satellite cells. Neural communication.
- 2. Research methods. Sensory and perceptual systems.
- 3. The sensorimotor system. Neural development.
- 4. Brain damage. Learning, memory, and amnesia.
- 5. Sleep, dreaming, and circadian rhythms. Drug addiction and reward circuits.
- 6. Emotion. Eating and drinking.
- 7. Lateralization, language, and the split brain. Consciousness.

# BIOPSYCHOLOGY (PSYC 356) - ONLINE (DISTANCE ED.) SYLLABUS

Instructor: Dr. R. Pavloski
Office: 306 Uhler Hall
Phone: 724-357-7912
IUP email: pavloski@iup.edu

Catalog Description
PSYC 356 Biopsychology
Prerequisite: PSYC 101

A study of the relationship between behavior and the anatomy and physiology of the nervous system. May not receive credit towards the Psychology major or minor for both PSYC 350 and 356.

#### **Biopsychology as a Distance Education Course**

In some ways, the resources provided by the internet are ideally suited to this particular course. A great deal of biopsychology is best presented and best understood visually. If you skim through the textbook for the course (or any other biopsychology or neuroscience book in a library or store), you will find that each and every page has illustrations on it. The textbook author *needs* these illustrations to make her or his point clearly. As your instructor, I need my illustrations and occasional movies for the same reasons. In some ways, it is advantageous to do this course online, as this can give you more flexibility in the time that you devote to the highly visual presentations.

While you cannot raise your hand online (well, you can, but it won't do much good), you can immediately type questions using WebCT email, and I will respond as promptly as I can. Furthermore, by using your textbook together with the online lectures, you can tackle each chunk of information at the pace that you find comfortable, and by doing so should acquire a good deal of knowledge from this joint book/internet format.

#### **Course Description**

As you know by now, psychology is a very heterogeneous scientific discipline. Researchers in each of the major areas of psychology often ask very different questions and use very different methods. While such specialization is apparently inevitable, it can have the unfortunate consequence of giving only a partial understanding of mental and behavioral phenomena. All mental events, feelings, and behaviors involve an interaction of brain mechanisms, events at the level of the person (such as beliefs, desires, and feelings), and events at the level of the group, all occurring in the context provided by your physical and cultural world. To this point in your psychology courses, most emphasis has been placed on the person and group levels, with little attention devoted to the brain. This course is an introduction to the biological level of explanation.

There are events in everyday life that simply cannot be understood without recourse to this perspective. How can we compare human psychological capacities with those of other organisms? Why are these particular capacities part of our evolutionary heritage? Where do visual images, sounds, feelings, and other aspects of the perceptual, emotional, and motivational worlds arise? What are memories, and what happens when we *store* or *recall* a memory? How is a movement made? What is a *voluntary* movement? What is an *automatic* movement? Do artists, musicians, and athletes have a brain organization that differs from those less skilled (like me)? How is language produced and understood? Why must we sleep? What are the consequences for the person you are if you sustain a brain injury? What are the prospects for recovery? Does the brain restructure itself? How does the brain produce consciousness, without which we would have no reason to study psychology (or anything else)?

While we have only partial answers to these questions, biological psychology at least represents a start. It is an essential piece of any psychological explanation. My aim in this course is to provide you with a sound foundation in the basics of biological psychology. This should translate into an appreciation for commonalities in brain mechanisms across species and how these can be understood as the products of natural selection, a knowledge of the major structures of the nervous system and its interfaces with sensory and motor mechanisms, a basic knowledge of the structure and function of cells of the nervous system, an understanding of major research tools and methods, and a knowledge of the brain mechanisms involved in development, sensation and perception, movement, emotion and motivation, and cognition.

#### **Course Outcomes**

Students completing this course will be able to:

- 1. Demonstrate a basic knowledge of the major structures of the nervous system, its interfaces with sensory and motor mechanisms, and its development.
- 2. Demonstrate a basic knowledge of the structure and function of cells of the nervous system.
- 3. Demonstrate familiarity with the noninvasive and invasive methods used to gain information about brain-behavior relationships.
- 4. Demonstrate knowledge of commonalities in brain mechanisms across species and how these can be understood as the products of natural selection.
- 5. Demonstrate knowledge of nervous system structures and processes involved in sensory, motor, emotional-motivational, and cognitive behaviors.
- 6. Use the above information to analyze behavioral outcomes as interactions among processes and events at the level of the brain, the person, and the group.

#### REQUIRED TEXTBOOK

Pinel, J. P. J. (2006). Biopsychology (6<sup>th</sup> edition). New York: Allyn and Bacon.

This is a uniformly excellent book. The author is a very productive research biopsychologist, and he communicates his knowledge of the subject and his enthusiasm very effectively in his writing. Please don't make the mistake of thinking that doing assigned readings before lectures is an option. It is very much necessary for success in this course.

The CD that accompanies the text is also extremely useful. The book and CD will form the core material around which the course is built. In addition to illustrative movies, the CD contains practice tests and electronic flashcards that may be useful in preparing for exams.

#### TENTATIVE COURSE OUTLINE

We will most of the Pinel book. My online lectures will not necessarily cover every topic that is assigned, and will contain some material that you will not find in the textbook.

SECTION	TOPICS	PINEL CHAPTERS
1	Introduction to biopsychology. Anatomy of the nervous system. Neurons.	1,3,4
2	Neurons. Research methods. Sensory syst	tems. 4,5,6
3	Sensory & motor systems. Development.	7,8,9
4	Development. Brain damage. Learning, memory, amnesia.	9,10,11

- 5 Learning, memory, amnesia. Sleep, dreaming 11,14,15 and circadian rhythms. Drug addiction and reward circuits.
- 6 Drug addiction and reward circuits. 15,16
  Lateralization, language and the split brain.
  Consciousness.

#### **EVALUATION**

Grading will be based on (1) six examinations that cover assigned readings and lecture material (80%); (2) completion of questions assigned for textbook reading and lectures (10%); and (3) written assignments that specifically test your conceptual understanding of the material and some of its applications (10%).

#### **Exams**

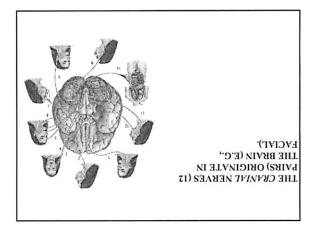
I will attempt to use several different types of question format for the exams, so that the format is well suited to the material being tested. You can expect both short-answer and multiple-choice questions, and other formats may be used as well (e.g., matching, diagrams, very short essay). The course is divided into six sections, each followed by an exam (the sixth exam will be given during the final exam time assigned to us). The average grade for the six exams is worth 80% of the course grade.

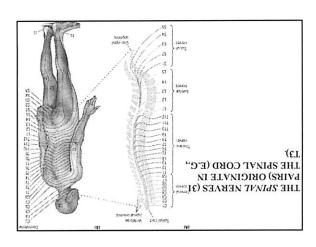
### **Questions Asigned for Textbook Readings and Lectures**

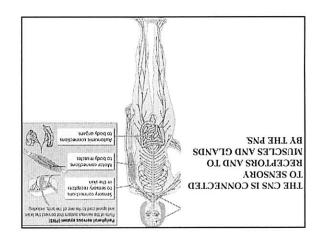
I will make available to you assignments together with my online lectures. These are to be completed and handed in to WebCT no later than the date indicated on the assignment. Some These assignments are meant to help you to judge the major points made in each textbook chapter and online lecture and to prepare for the examinations. They contribute 10% of the course grade.

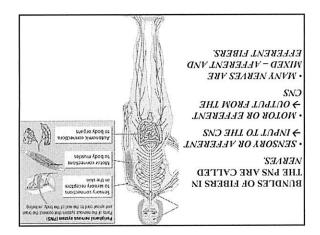
#### **Short Written Assignments**

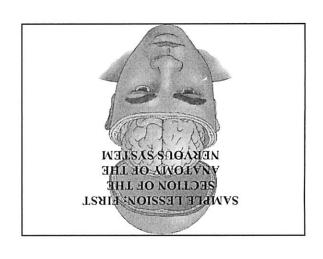
Very short writing assignments will be made periodically. You can expect at least one for each section of the course. These assignments will deal with specific applications of course material to other areas of psychology that you study (such as the study of memory systems in your course on cognitive psychology), and to applied areas of psychology (such as psychological disorders and problems that follow from head injuries). They are meant to demonstrate to you how the material in this course applies to the area of psychology more generally, and should give you an opportunity to relate the material to whatever you find most interesting in our discipline. These assignments contribute 10% to the course grade.

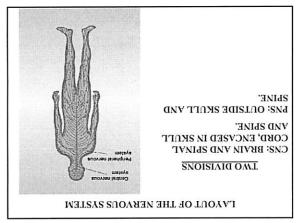


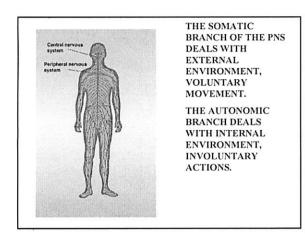


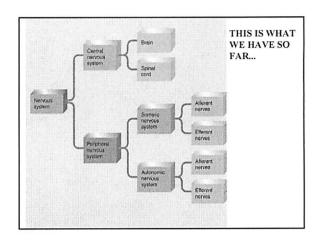


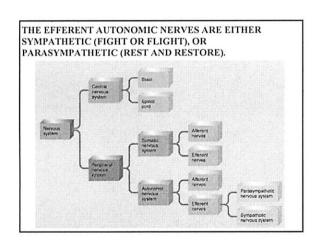


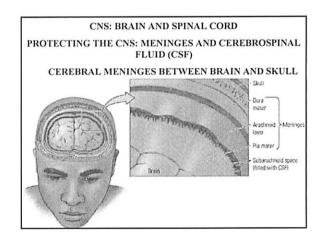


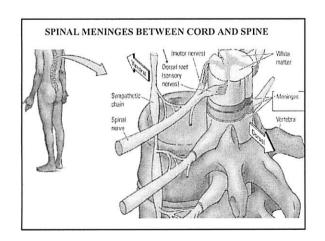


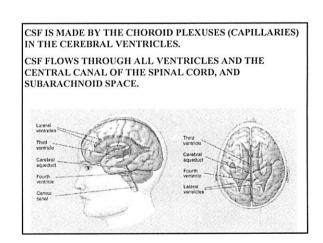


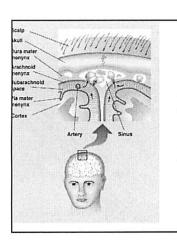




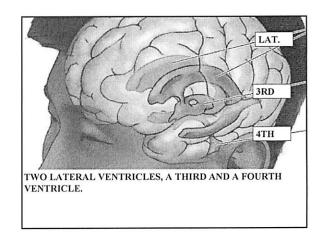


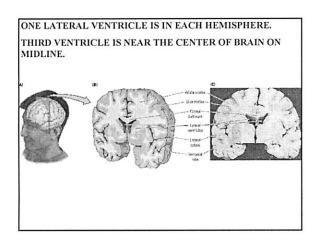


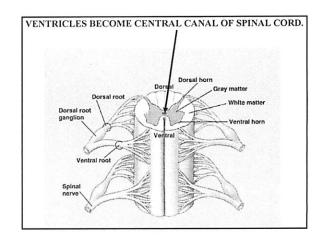




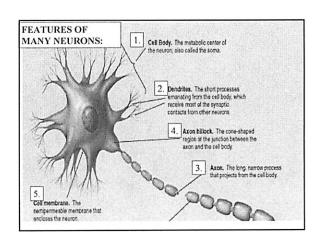
IT IS ABSORBED INTO DURAL SINUSES AND RETURNS TO THE HEART (THERE WAS A MATH PH.D. STUDENT AT OXFORD WHO BEGAN HAVING SOME TROUBLE WITH VISION. HIS ENTIRE BRAIN WAS COMPRESSED TO BE JUST A FEW MILLIMETERS THICK BECAUSE A BLOCKAGE PREVENTED CSF ABSORPTION).







# CELLS OF THE NERVOUS SYSTEM 1. NEURONS 2. GLIA (OR NEUROGLIA)

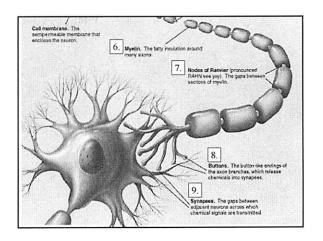


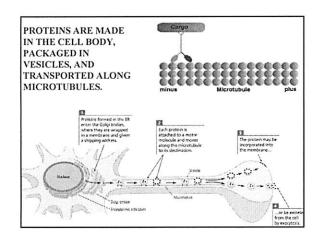
CELL MEMBRANE: A LIPID BILAYER PREVENTS PASSAGE
OF WATER AND ALL PARTICLES BOUND TO WATER THE
NEURON CONTROLS PASSAGE THROUGH CHANNEL
PROTEINS.

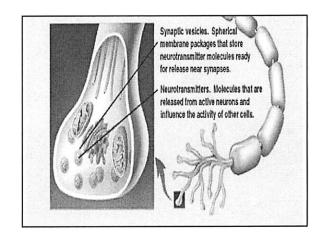
Channel
DUTSIDE

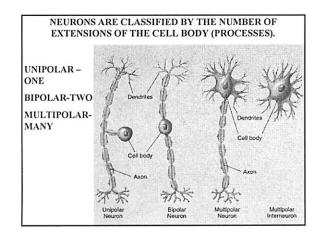
Upid
bilityer

INSIDE







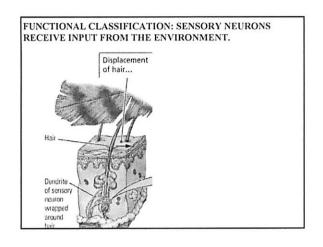


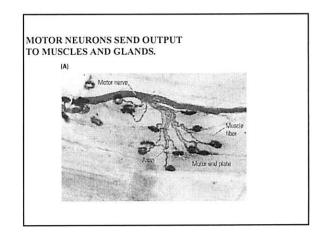
A COLLECTION OF CELL BODIES IN THE CNS IS A NUCLEUS (PLURAL – NUCLEI).

A COLLECTION OF CELL BODIES IN THE PNS IS A GANGLION (PLURAL – GANGLIA).

A BUNDLE OF AXONS IN THE CNS IS A TRACT.

A BUNDLE OF AXONS IN THE PNS IS A \_\_\_\_\_\_.

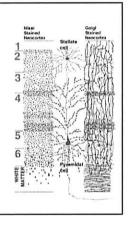


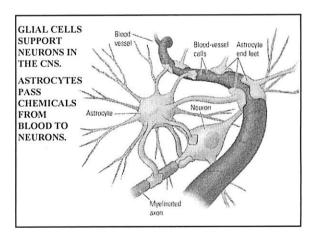


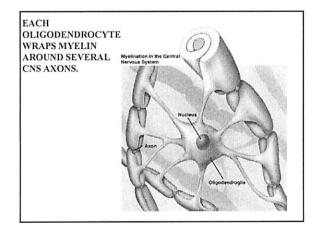
MOST NEURONS ARE NEITHER SENSORY NOR MOTOR. CALLED INTERNEURONS.

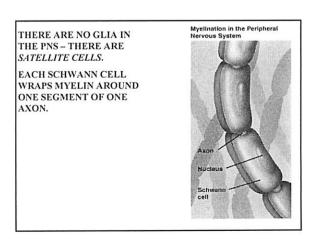
1. THEY RECEIVE INPUTS FROM AND SEND OUTPUTS TO OTHER NEURONS.

2. THEY "COMPUTE" AN OUTPUT FROM THOUSANDS OF INPUTS, AND ARE PART OF MODULES OR NETWORKS.









#### SAMPLE LESSON:

FIRST SECTION OF LEARNING, MEMORY, AND AMNESIA

#### SOME TERMS

Amnesia simply indicates a loss of memory. Used alone, it is a very nonspecific term.

More specifically,

Anterograde amnesia is loss of memory for events following an injury or insult to the brain.

Retrograde amnesia is loss of memory for events occurring prior to an injury or insult to the brain.

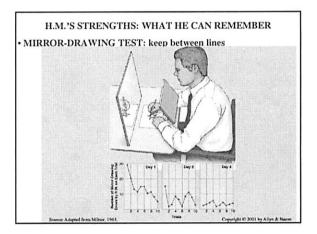
THE FAMOUS CASE OF H.M.: A SMALL RETROGRADE
AMNESIA AND A PROFOUND ANTEROGRADE AMNESIA
IN THE EARLY 1950'S, H.M. HAD THE MEDIAL PORTIONS OF
BOTH TEMPORAL LOBES REMOVED TO CONTROL LIFETHREATENING SEIZURES.

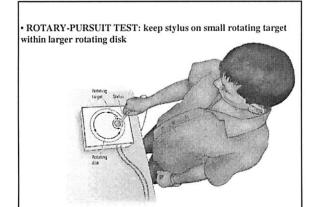
• Medial Temporal Lobectomy

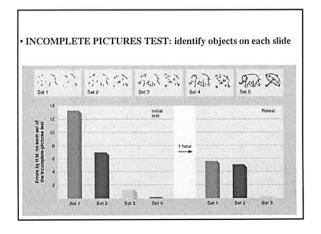
Frontal lobe
Office Chiasm
Optic
Chiarm
Deptic
Deptic
Deptic
Deptic
Chiarm
Deptic
Depti

# MAJOR DEFICIT: A DEVASTATING ANTEROGRADE MEMORY LOSS

- DIGIT SPAN + 1 TEST (START WITH 5 RANDOM DIGITS AND CONTINUE ADDING A DIGIT TO RECALL UNTIL PERSON FAILS; NORMAL IS ABOUT 15; H.M. GETS TO 7).
- BLOCK-TAPPING MEMORY SPAN TEST REMEMBER THE SEQUENCE OF TAPPING BLOCKS (H.M. NEVER GETS PAST ABOUT 6, FAR BELOW AVERAGE).
- H.M. HAS NEVER FORMED A NEW LONG-TERM EPISODIC MEMORY SINCE THE SURGERY. THAT IS, HE CANNOT RECALL ANY OF HIS LIFE EVENTS THAT TOOK PLACE SINCE THE SURGERY!









CHARACTERIZING H.M.'S MEMORY DEFICIT

WHAT DIFFERENTIATES THE TASKS THAT H.M. CAN LEARN FROM THOSE THAT HE CANNOT?

ALTHOUGH HE SHOWS IMPROVED PERFORMANCE ON TASKS, WHATEVER HE RECALLS IS NOT AVAILABLE TO HIS CONSCIOUS MIND.

HIS PERFORMANCE IMPROVES, BUT HE DOESN'T REMEMBER LEARNING!

HE CAN CONSCIOUSLY RECALL MEMORIES OF OLD EXPERIENCES, BUT IT SEEMS THAT HE CANNOT FORM NEW ONES THAT HE CAN RECALL CONSCIOUSLY.

# H.M. HAS A DEFICIT IN CONSOLIDATION OF EXPLICIT MEMORIES.

CONSOLIDATION IS THE TRANSFER FROM SHORT-TERM STORAGE TO LONG-TERM STORAGE.

EXPLICIT MEMORIES ARE THOSE THAT CAN BE CONSCIOUSLY RECOLLECTED.

IMPLICIT MEMORIES ARE THOSE THAT ARE DEMONSTRATED ONLY THROUGH PERFORMANCE.

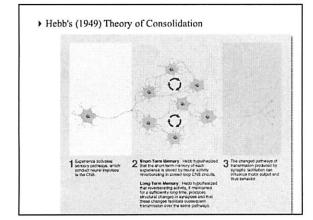
#### HEBB'S THEORY OF CONSOLIDATION

EACH ASPECT OF EXPERIENCE IS ENCODED AS A PATTERN OF ACTIVITY IN AN ASSEMBLY OF NEURONS – A CELL ASSEMBLY.

A SHORT TERM MEMORY IS REVERBERATION IN A CELL ASSEMBLY.

CONSOLIDATION IS THE PROCESS BY WHICH SYNAPSES IN THE CELL ASSEMBLY ARE STRENGTHENED.

IT SEEMS THAT H.M. CANNOT CONSOLIDATE ANY NEW EXPLICIT MEMORIES.



BEYOND H.M.: MEDIAL TEMPORAL LOBE AMNESIA (A NEUROPSYCHOLOGICAL DEFICIT)

#### DIAGNOSIS REQUIRES:

A PATTERN OF MEMORY DEFICITS LIKE THOSE OF H.M. – INTACT IMPLICIT MEMORY AND DAMAGED EXPLICIT MEMORY.

PRESERVED INTELLECT (NO DEMENTIA).

TEMPORAL LOBE DAMAGE.

THE SALESMAN ON THE QUEEN ELIZABETH WAY SEVERLY DAMAGED BOTH TEMPORAL LOBES WHEN HIS CAR WAS HIT BY A TRUCK. HE WAS TESTED ALL MORNING LONG, AND REINTRODUCED HIMSELF TO THE PSYCHOLOGIST WHO TESTED HIM AFTER BEING TAKEN TO LUNCH!

TESTING IMPLICIT MEMORY PERFORMANCE

#### REPETITION PRIMING TESTS:

- 1. EXAMINE A LIST OF WORDS.
- 2. COMPLETE WORD FRAGMENTS (E.G., \_\_ M P \_\_ I C \_\_ T).

RESULTS: MANY AMNESIC PATIENTS USE AS MANY WORDS FROM THE ORIGINAL LIST AS DO NORMAL CONTROLS.

#### THE EXPLICIT MEMORY DEFICIT

MOST MEDIAL TEMPORAL LOBE AMNESIC PATIENTS HAVE NEAR-NORMAL SEMANTIC EXPLICIT MEMORIES -MEMORIES FOR FACTS (FRANCO HARRIS WAS DRAFTED BY THE STEELERS IN 1972).

THEIR DEFICIT IS IN EPISODIC EXPLICIT MEMORIES (CANNOT REMEMBER WHAT THEY HAD FOR BREAKFAST -THEIR LIFE EPSIODES).

#### OTHER NEUROPSYCHOLOGICAL AMNESIAS THAT WE WILL DISCUSS:

- 1. CEREBRAL ISCHEMIC DAMAGE TO THE HIPPOCAMPUS.
- 2. THE AMNESIA OF KORSAKOFF'S SYNDROME
- o DUE TO CHRONIC ALCOHOL ABUSE
- DAMAGE TO MEDIAL DIENCEPHALON, NEOCORTEX, **CEREBELLUM**
- ANTEROGRADE AMNESIA IN EARLY STAGES.
- 3. THE AMNESIA OF ALZHEIMER'S DISEASE
- DIFFUSE BRAIN DAMAGE.
- ANTEROGRADE, RETROGRADE, STM, AND IMPLICIT MEMORY LOSSES IN PREDEMENTIA PATIENTS.

#### THE PUZZLE OF CONSOLIDATION

TESTING HEBB'S THEORY

POSTRAUMATIC AMNESIA AS EXPLAINED BY HEBB:

BLOW TO HEAD→COMA, FOLLOWED BY PERIOD OF CONFUSION AND ANTEROGRADE AMNESIA, AND A SHORT PERIOD OF RETROGRADE AMNESIA.

HEBB'S EXPLANATION OF RETROGRADE AMNESIA: THE TRAUMA DISRUPTED CONSOLIDATION OF SHORT-TERM MEMORIES.

#### THE PUZZLE OF CONSOLIDATION

TESTING HEBB'S THEORY

AN EXPERIMENTAL MODEL: DELIVER ECS (ELECTROCONVULSIVE SHOCK)→CONVULSION AND RETROGRADE AMNESIA.

THE DURATION OF THE RETROGRADE AMNESIA SHOULD INDICATE HOW LONG IT TAKES TO CONSOLIDATE.

ECS LEARNING === time

Duration of retrograde

amnesia = consolidation time

FOR SIMPLE TASKS, ECS-PRODUCED RETROGRADE AMNESIA LASTS FOR A FEW MINUTES.

ALSO DONE WITH PATIENTS RECEIVING ECS FOR CLINICAL DEPRESSION.

TEST MEMORY FOR EVENTS OCCURING AT VARIOUS TIMES PRIOR TO ECS DELIVERY. TEST BOTH BEFORE AND AFTER ECS.

RESULTS FOR TV SHOWS ON FOR ONLY ONE SEASON (SQUIRE ET AL., 1975): ECS DISRUPTED MEMORY FOR TV SHOWS PLAYING IN THE 3 YEARS PRIOR TO TREATMENT, BUT NOT FOR THOSE PLAYING EARLIER.

CONSOLIDATION TAKES 3 YEARS? CAN'T BE DUE TO HEBB'S NOTION OF CONSOLIDATION.

Subject: Re: docket attached

From: "Gail S. Sechrist" <gailsech@iup.edu>

Date: 8/12/2013 4:51 PM

To: Sharon Aikins <saikins@iup.edu>

Sharon,

I see that you still have ECON 405 and PSYC 356 on the 2013-14 Docket these were the two that were to be removed for inactivity.

So number 1 should be FIN 360

Gail

8/13/2013 8:49 AM