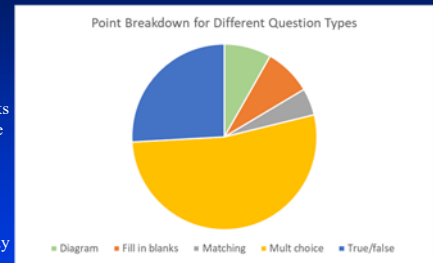


Pre-Final Exam Review

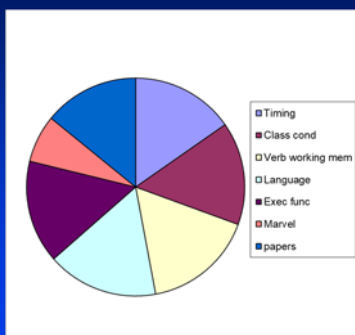
- Exam Date: Thur Dec 12, 2019
 - @ 6:00 PM – 8:00 PM
- Place: Ames Hall Room 234

Format

- Similar to midterm
 - matching
 - diagrams
 - fill in the blanks
 - multiple choice
 - true/false
 - No essays
 - This is approximate, exact distribution may change



Exam Breakdown



Timing

- How the idea started: Braitenberg's original theory
- What kinds of studies have been used to investigate timing production – main results
- Timing production: breakdown of variance in finger tapping
- What kinds of studies are used to investigate timing perception – main results
- What have we learned from meta-analyses of timing

Classical conditioning

- Definitions: CS, US, CR, UR
- Different kinds of protocols: delay, pseudoconditioning, trace
- Brain regions critical for delay vs trace
- Cerebellar circuitry for eyeblink conditioning
- Timing of the CR
- What type of memory system?

Verbal Working Memory

- What is the Sternberg task and its 3 phases?
 - Encoding phase: Are the cerebellar activations just due to sensory acquisition?
 - Maintenance phase: refreshment of phonological store, how can we increase or decrease activation in this phase?
- What are the subcomponents of VWM according to the Baddeley model?
 - What areas of the neocortex and cerebellum have been linked to these subcomponents and why?
 - Cerebellar function for these subcomponents: forward model?
- What have we learned about VWM from patient and TMS studies?
- Alcohol and VWM

Language

- Main types of language studies we considered?
- What is the priming effect on behavior and neural activity – where have we seen priming in language studies?
- Hemispheric dominance for language and implications for cerebellum?
- What kinds of tasks have been used to study language?
 - e.g. the verb generation task has historical significance and we discussed several studies using this task
 - Stem completion
 - What are main findings and results
 - Again, not expecting you to memorize activation tables!

Language

- What kinds of verbal stimuli produce the greatest amount of cerebellar activation?
- What happens when we learn the names of new objects?
- Cerebellum and dyslexia
- Does the cerebellum show involvement in the processing of the meaning of words, and what kinds of experiments are used to test that?

Executive function

- How can verbal working memory be made into a more executive task?
 - How did the executive Sternberg verbal working memory fMRI results (Desmond & Marvel) relate to transneuronal tracing studies (Strick)?
- What is a verbal fluency task?
 - What has neuroimaging revealed about its typical activation pattern?
 - What have patient studies told us about how the cerebellum might contribute to fluency strategies?

Executive function

- Know the various tests, eg., WCST, Stroop
 - What are poor performance patterns?
 - Which ones are especially sensitive to brain damage?
 - How have they been studied using neuroimaging and in patients?
 - e.g., control conditions for Stroop neuroimaging study

Executive function

- How can we study reasoning/planning in the magnet?
 - Main outcomes
- What happens to cerebellar patients during dual task performance?
- What is Theory of Mind and how can we study it experimentally?

Cerebellum and Clinical Populations (C. Marvel)

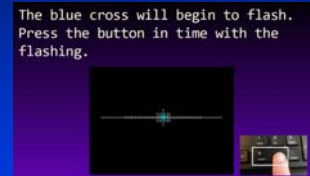
- Lecture by Dr. Cherie Marvel
- Historical background: Henrietta Leiner
 - What was her background?
 - Why did she think the cerebellum allowed for rapid information processing
- Cerebellar degeneration can be due to endogenous or exogenous factors

Cerebellum and Clinical Populations (C. Marvel)

- Different types of disorders with link to cerebellar abnormality
 - One of these linked to a specific cell type

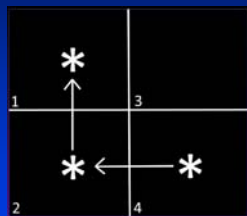
Cerebellum and Clinical Populations (C. Marvel)

- What abnormalities were found in the timing task?
- Why are they not likely due to simple motor impairment?



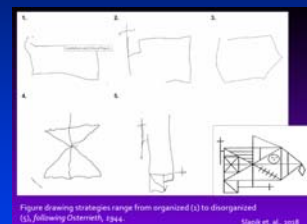
Cerebellum and Clinical Populations (C. Marvel)

- How do cerebellum patients differ from controls in learning to move the * with button sequence rules?



Cerebellum and Clinical Populations (C. Marvel)

- How do cerebellum patients differ from controls in copying the Rey-Osterrieth figure?



Cerebellum and Clinical Populations (C. Marvel)

- She also described a “Verbal Encoding Task”
- What were the tasks administered?
- What information was collected for each of the patients and controls?
- How did patients and controls differ?

Cerebellum and Clinical Populations (C. Marvel)

- What does she argue is the explanation for the overall pattern of impairment observed for the cerebellar patients on all of the tests that were administered?

Papers

- Will focus on main points

Papka et al

- What were the different groups that received conditioning training?
- Which group(s) that received paired conditioning training showed the poorest conditioned responding, and why?
- How is this experiment consistent with the notion that there are different neural substrates for different memory systems?

Cooper et al

- What types of working memory tasks were used for correlations with cerebellar gray matter, and what were the results?
- In terms of cognitive functions that are utilized, what distinguishes the Forward Digit Span and Story Recall subtests from Backward Digit Span and Letter/Number Sequencing tasks?
- Which tests did not show correlation between gray matter and performance?

Nicolson & Fawcett

- What kinds of impairments have been found in dyslexic children?
- What kinds of evidence links dyslexia to the cerebellum?
 - Also, we discussed structural neuroimaging evidence outside of this paper
- What do the authors feel is the main deficit in dyslexia?