

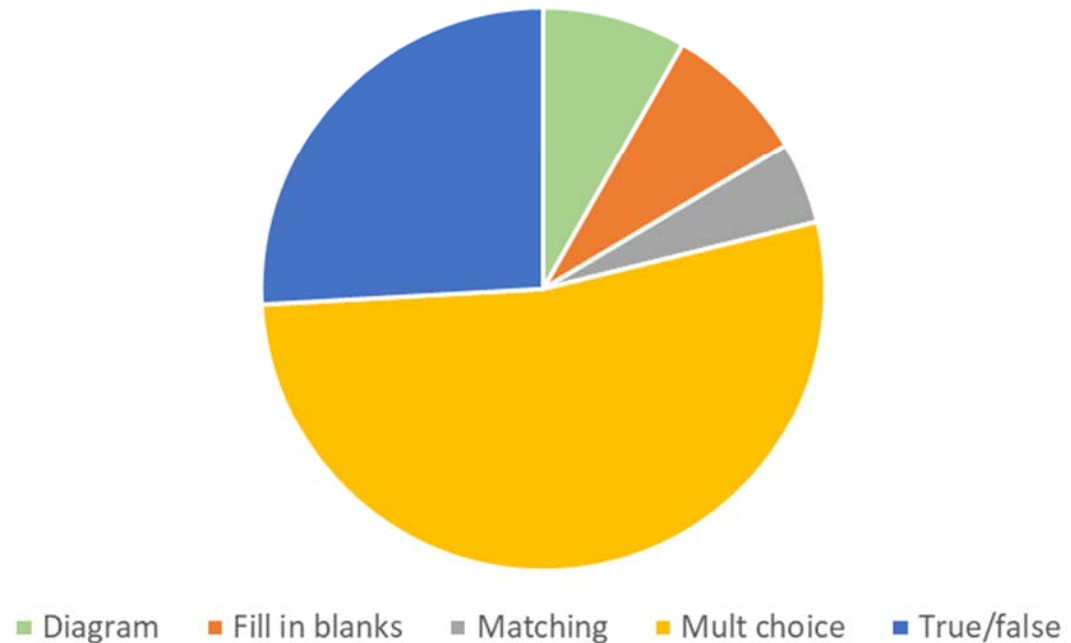
Pre-Final Exam Review

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

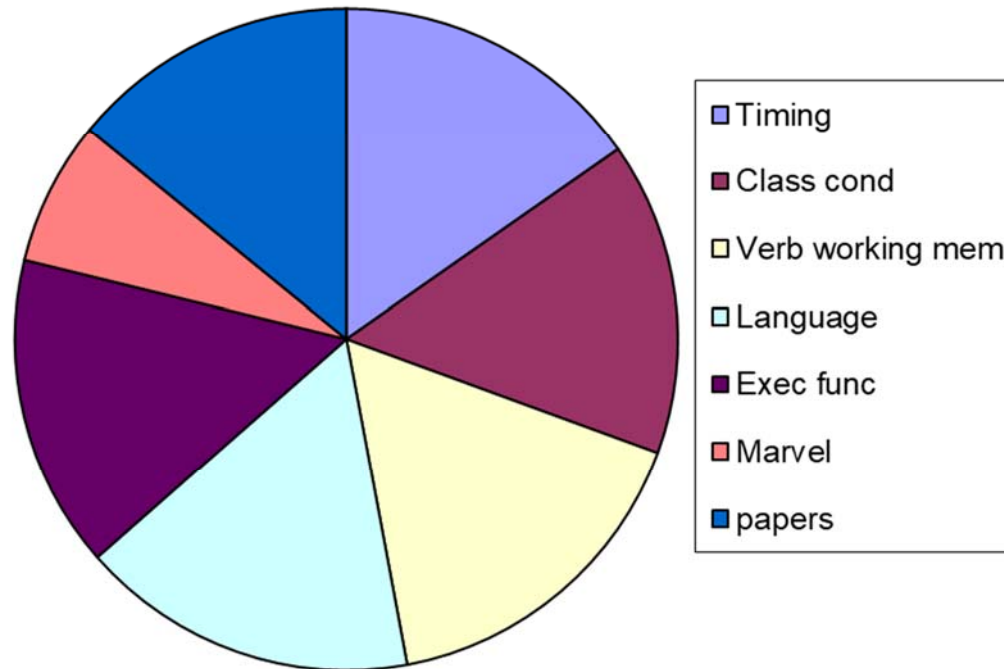
Format

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

Point Breakdown for Different Question Types



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

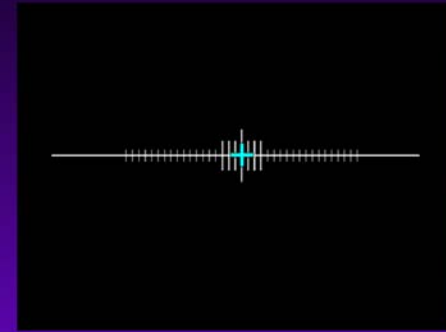
Cerebellum and Clinical Populations (C. Marvel)

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

Cerebellum and Clinical Populations (C. Marvel)

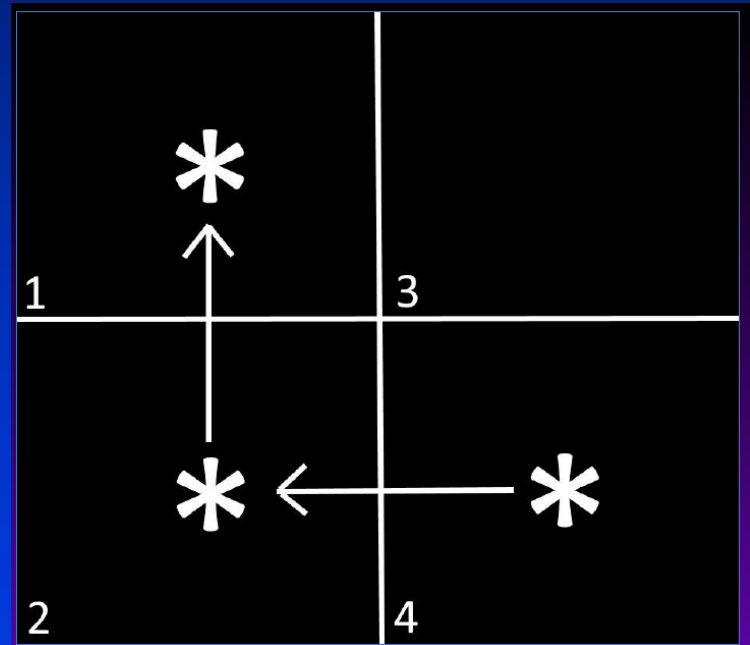
- What abnormalities were found in the timing task?
- Why are they not likely due to simple motor impairment?

The blue cross will begin to flash. Press the button in time with the flashing.



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?

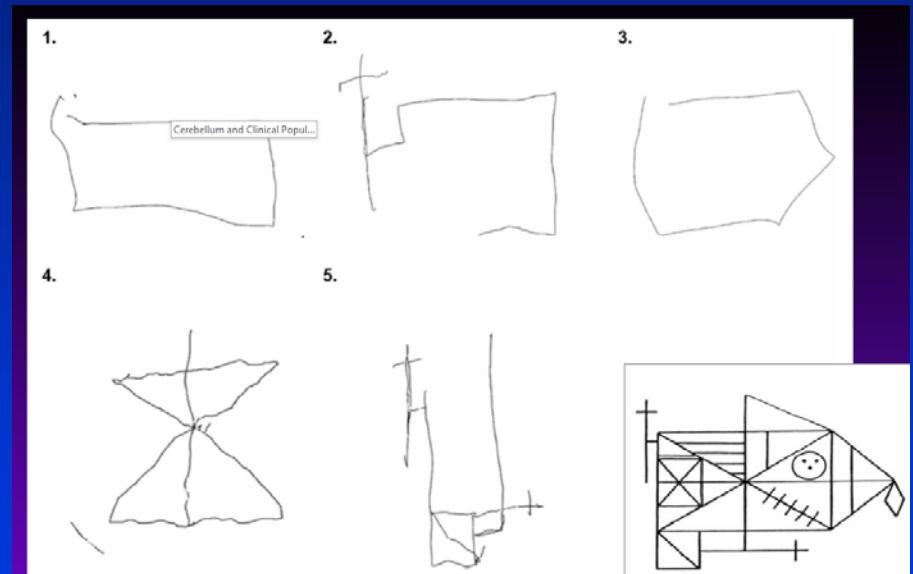


Figure drawing strategies range from organized (1) to disorganized (5), following Osterrieth, 1944.

Slapik et. al., 2018

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?