

Language

What are the 5 characteristics of language?

What are the components of language(Hint: start with phonemes)?

What is categorical perception? Why is it useful?

What is the strong version of linguistic relativity hypothesis? What is some evidence in favor of this version? What is some evidence in favor of the weak version?

Explain the color perception with the Himba people.

What are formants? How do they relate to consonants and vowels?

In a linguistic context, what is statistical learning? Does it support or refute the domain specific theory of language learning?

What are the results of severe language deprivation during early childhood?

Explain the McGurk effect.

Evolutionary Psychology

Explain the key components of natural selection.

Why does a peacock have such an elaborate display even though this display has many negative effects?

Give examples of ecological niches.

Give some examples of animals showing cognitive skills.

What are the ways in which we relate brain characteristics to intelligence?

Which era was especially important in evolutionary development?

Explain the Wason selection task. Explain how evolution may have created specific domains that allow people to perform much better on this task.

How does evolutionary theory explain why people are much better at dealing with frequencies than percentages?

Explain the framing effects of gain and loss.

What are some gender differences in cognition? How can we explain them with evolutionary psychology?

What are some examples how genes affect our preferences for mates? How does mate preference during the reproductive cycle for women?

Signal detection theory (SDT)

When do we use SDT?

What are the assumptions of SDT?

How do sensitivity and bias interact to produce performance in SDT?

Which components of SDT can be altered by an observer?

What factors affect where thresholds are set?

What does an ROC curve show?

Be able to produce ROC curves from SDT diagrams and vice versa.

How is sensitivity measured?

How are SDT curves and ROC curves produced?

Be able to calculate d' and bias given hits and false alarms.

Neuroscience

What types of cognitive/perceptual functions are most informed by brain structure?

How does fMRI work? What are the strengths and weaknesses of the technique? What is subtraction method? What is a parametric study?

How does PET scans work? What are the strengths and weaknesses of the technique?

How does EEG work? What are the strengths and weaknesses of EEG?

Describe three types of brain stimulation.

What is the basic structure of the visual system? How do we perceive color? What is the relationship between wavelength and color perception?

How does lateral inhibition work? What is it good for?

How do two types of Ganglion cells work?

Neuroscience Functions & Damage

What is the basic architecture of the two hemispheres as it relates to visual space and motor function? What do split brain studies tell us about consciousness and personal preferences?

How does handedness relate to dominant hemispheric processing of language?

How does hemispheric damage affect the emotional reaction to brain damage?

How do we assess brain functions of a hemisphere in normal people?

What is hemispatial neglect and how likely is it given damage to each hemisphere?

What is ,anosognosia and anosodiaphoria?

What is alien hand syndrome? How does the mirror box treat phantom pain? How does the cortex reorganize after losing a body part?

What is declarative memory and what are the brain structures that process declarative memory? What is retrograde and anterograde memory? How does memory consolidation work? What kind of memory deficits does consolidation produce?

What is apperceptive and associative agnosia? Where are faces processed in the brain?

What is a face-processing deficit called?

What is neural synchrony? Describe different types of neural synchrony.

How can temporal binding be used to represent object shape?

The network approach

What are some similarities and differences between the brain and standard computers (like the ones running a typical pc)?

What are local and distributed representations?

What is the basic components of a neural network?

What is the basic structure of a perceptron? What are its limitations? How can those limitations be overcome?

What is supervised learning? What problem is there in applying supervised learning algorithms to the human brain?

What is back-propagation?

What are some desirable characteristics of neural networks?

What are some problems with creating artificial neural networks?

What is the concept of centrality in the discussion of networks? What are some examples of centrality?

Give an example of a hierarchical network in the human brain.

What is a small-world network? What is a random network and an ordered network?

What is an egalitarian and an aristocratic network?

What is percolation? What psychological disorder might exhibit percolation? How might percolation be beneficial for certain types of thinking?

Artificial intelligence

What are structural and functional kinds?

What is the Turing test? How does it relate to functional and structural kinds? What are some criticisms of it and what are some responses to those criticisms?

What is Searle's Chinese room? How does it relate to the Turing test?

What is a Turing Machine? What can it do?

What are some examples of recent development in artificial brains and/or intelligence?

Final thoughts

Give some examples of how biased sampling can impair judgements.