

# Second Discussion Class

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## Discussion Question

Is top-down processing advantageous or harmful?

It is mostly advantageous since it allows us to quickly recognize things around us

It is not just advantageous but essential—we couldn't get along in the world if we didn't predict what would happen next

It can be very disruptive since it can impair our ability to recognize unexpected or novel things

If we didn't use top-down processing to make predictions, we would not be able to learn when we are wrong and make corrections

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## Discussion Question

Given that brains, like all living systems, adapt to changes, can we really learn anything from lesion experiments?

Yes. Given that brain parts perform specific functions, you can see what happens when one is lost

Yes. Even if some other part takes over the function, it won't do it as well

Yes. As long as you study the individual before the brain has time to adapt

No. Lesion experiments are inherently misleading in a adaptive system

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## Discussion Question

You are a visual scientist and have a obliging monkey who will look at shapes you display and let you record from V4 in his/her brain. But eventually he/she will quit. How do you figure out which shapes to present in the time you have?

Start with the simplest shapes and then try putting them together

Randomly pick out shapes and try them

Ask an artist what are the sort of shapes she needs to put into the pictures she draws

Ask a Gibsonian psychologist what types of shapes is it important for the monkey to pick out to get along in the world

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## Discussion Question

Why did Marr think that the coupling between the algorithmic and the implementation level is loose?

Algorithms have nothing to do with how they are implemented—they are a set of abstract rules

The same algorithm can be run with very different implementations

The same material that implements one algorithm can implement many others

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## Discussion Question

Gibson rejects Marr's construal of the visual system as making inferences. What might be a reason?

Inferences are only things people make. It is a confusion to think that brain parts make inferences

It distracts researchers from identifying the information actually available to the organism

He thought that studying the neurons and what they do would be sufficient. One didn't have to turn to fancy mathematics

He was confused about what Marr was trying to do —Marr was trying to understand how organisms use the information in their environments

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## Discussion Question

What is the difference between treating neurons in a brain region as detectors and as filters?

Nothing. A filter is just another name for a detector

A filter provides a continuous output so that even stimuli that don't produce a maximum output still generate some output that can be used

A filter can employ a variety of functions, not just the likelihood of a feature

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## Discussion Question

Scientists have come up with highly compelling evidence that a particular hypothesis is wrong (that memories are stored in specific locations, that area MT processes motion). What should the community of scientists do with that hypothesis?

Forget it—it is wrong, and we are really only interested in what is right

Keep it alive by teaching it even when showing how evidence shows it to be wrong

Leave it to historians and philosophers to remind people of it—they have nothing better to do

Other

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## Discussion Question

Does Fodor's money argument against reduction entail that the mind must be immaterial since mental states don't map onto specific neural types?

Yes—if the mind doesn't map onto neural types, it cannot be part of the physical world

No—it may still be perfectly physical, just not conforming to distinctions made in about neural states

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## Discussion Question

What is required to describe a set of brain regions as forming a hierarchy?

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