

# COMP 20090: Introduction to Cognitive Science.

## Study Sheet: Movement

The brain interacts with the outside world by one means only. What is it?

What is the degrees of freedom problem?

What are the principal features of the finger wagging task studied by Kelso and colleagues? (2 stable modes of coordination at moderate speed; transition to a single, in-phase mode at high speeds, critical fluctuations just before the transition)

Coordination principles are common across species

What does it mean for two periodic processes to be coupled or entrained?

Why might you never find a horse that gallops at slow speeds or walks at fast speeds?

What do the treadmill experiments with mesencephalic cats illustrate?

How can it be shown that coupling among limbs is not necessarily based on physical coupling (forces, nervous systems), but may be based on information alone?

What is a coordinative structure? What experiments demonstrate the assembly of disparate parts into a single goal-directed structure?

Why is it hard to pat your tummy and rub your head at the same time? Why is it much harder to do so with each hand moving at a different rate?

In what ways do coordination experiments show that the motor program metaphor is misleading?

What are the principle parts of the brain linked to the coordination of movement?

On what ways does the control of the speech organs resemble other coordination tasks, and in what ways might it be unique?

How do speech errors reveal something about the organization of movement, and movement planning in particular?

What is coarticulation?