


PHIL 256
 The Future of Cognitive Science
NO ELECTRONICS
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
Futures for Cognitive Science

1. Dualism
2. Embodied, embedded, extended, enacted, dynamic systems
3. Bayes craze
4. Multilevel explanations
 - molecular, neural, psychological, social
 - incorporation of body & world
 - many applications, including consciousness and creativity

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Mechanisms

A mechanism is a system of parts whose interactions explain regular changes and critical transitions.

Examples: bicycle, heart & lungs, brain. 

Psychological mechanisms:
 Parts are mental representations that are both cognitive and emotional. Interactions are computational procedures.

Social mechanisms:
 Parts are people. Interactions are verbal and non-verbal communication.

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Levels of Mechanisms

	<i>Parts</i>	<i>Relations</i>	<i>Interactions</i>	<i>Changes</i>
<i>Molecular</i>	Molecules	Chemical	Reactions	Chemical
<i>Neural</i>	Neurons	Synapses	Excitation	Firing patterns
<i>Psych'l</i>	Representations	Constituents	Computations	Inferences
<i>Social</i>	Persons, groups	Associations	Communication	Group actions

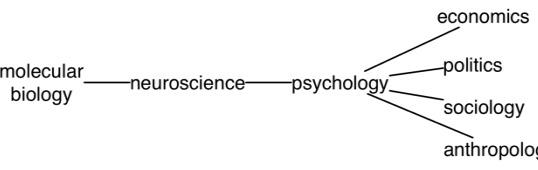
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Relations between levels

<p>Reductionist parts/whole: groups are made of persons with brains made of neurons made of molecules interactions at higher level result from interactions at lower level</p>	<p>Non-reductionist changes at higher levels can cause changes at lower levels e.g. social stress affects cortisol levels</p> <p>Multilevelism: Pay attention to all relevant levels and their interactions.</p>
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Integrating Levels



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Discussion Questions

- What do you think are the biggest successes of cognitive science?
- What do you think are the biggest problems?

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Your future in cognitive science

- Major applications: decision making, education, human-machine interaction, intelligent systems, mental health.
- Strategy:
 - Identify levels of explanation most relevant to your interests.
 - Adopt relevant methods, e.g. experiments, simulations.
 - Keep track of relevant research at related levels.
 - Integrate levels: molecular, neural, psychological, social.

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Cognitive Science at UW

- Cognitive Science Minor
- PHIL 255: Philosophy of mind
- PHIL/PSYCH 447: Seminar in cognitive science
- SYDE 556: Simulating neurobiological systems
- Research assistants

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Key points

- Cognitive science has been successful in using computation/representation to explain how people perform many important psychological phenomena.
- Explanations in cognitive science employ explanations at multiple levels.
- Challenges can be met by expanding the computational-representational approach to include brain, body, world, and social interactions.

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