

CHIP-6
 Concepts and history in psychology

Disciplinary neighbours

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<http://www.psy.gla.ac.uk/~steve/courses/chip.html>

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Disciplinary neighbours

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This lecture topic

This lecture continues about disciplinary differences, and relationships between disciplines.

Why does this matter?
 One way to understand how psychology operates, and to evaluate it, is to compare it with other disciplines.

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A map: where would psychology go?

Science Single answers, original questions	Computer Science	Chemistry
	Medicine	Philosophy
“Art” Original answers	Sculpture	Literature (criticism)
	Applied single context	Unapplied (Pure) single generalisations

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Dimensions (1)

Can we find a system for classifying, mapping the set of existing disciplines? Are there just a few underlying ways in which they vary from each other?

Many (not all) studies come up with 2 dimensions.
 Different authors describe these differently, but my version is:

- 1) Pure vs. applied
- 2) Humanities vs. science . “Arts” vs. science .

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Humanities vs. science

Art vs. science // objective vs. subjective // abstract, concrete // soft, hard // public, private
 Meaning vs. materiality

Science studies what nature has; inanimate effects.
 The Humanities study what humans have done or created; human agency.

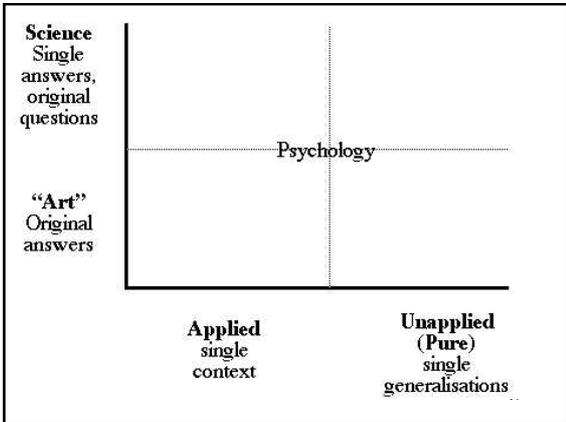
So Humanities address intentionality, perspectives, feelings
 So are likely to require uncertainty, perspectives, relativity.
 You might say they are reflection on past human action, and look for (almost always multiple) perspectives.
 Often (not always) this is grounded on human subjective judgements (– what other standard is relevant?)

These in turn lead to characteristic modes of thought: unresolved questions, seeking to problematise not problem-solve.

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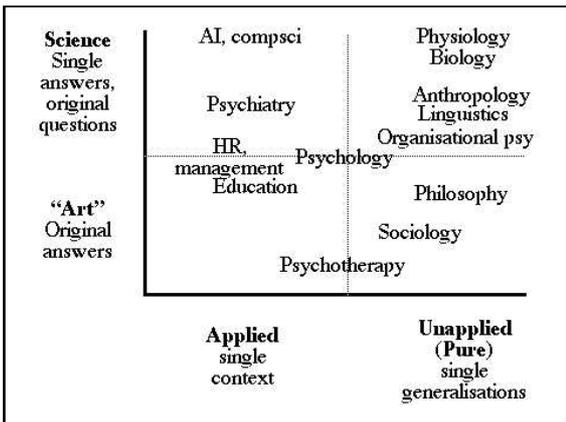
Psychology's disciplinary neighbours

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- ### Psychology's neighbours
- Philosophy
 - Sociology
 - Anthropology
 - Physiology, neurology
 - Biology, (evolutionary psy)
 - Computer science, artificial intelligence
 - (Education) IQ, testing (psychometrics), learning
 - Psychiatry, medicine
 - Personnel management (HR); management
 - Linguistics, psycholinguistics,

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- ### Examples of cross-boundary topics
- Migraine: physiological or psychological? [Sacks (1992)]
 - Pain: physiology or psychology? [Wall (1999)]
 - Public Health: medicine, psychology, sociology? [WHO]
 - Solo - Social perspectives; in education, and in psychology generally. Motivation. Kitty Genovese. Driving behaviour.
 - J.J.Gibson on perception: psychology, optics (physics), awareness ... Not representation but information, lawful relationships of object and properties in the light.
 - Integration over time and space, not via an immobilised single eye [reductionism]

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Systems and levels of explanation (Reductionism)

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The feeling of explanation

Humans seem to like the feeling that something is explained. However there is reason to think we are poor judges of the quality of an explanation (Kieras & Bovair, 1984)

Generally speaking, explanations are deductions, where some general rule is used to deduce (post hoc) some specific (observed) case.

One kind is a set of axioms e.g. in geometry; or the rules of chess.

Such examples show how a very small number of simple rules can give rise to complexities that can occupy clever people for generations.

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Types of (deductive) explanation

- A. Axioms or game rules: explanation in a closed system, at one level.
- B. Reduction: explaining one level by a lower level that implements it e.g. atoms explain molecules, which are all made up of combinations of atoms; DNA "explains" genes, which are all expressed and transmitted in DNA code.
- C. The pure → applied cascade of research. The notion is that if we have the theory, then we can deduce applications, which are particular uses of the theory in particular cases. The cascade is logical, but often not how it happened historically.

Logic = a justification of the idea.

Logic ≠ Causation of the idea in a person or scientific field.

A,B,C all use and exalt deduction, though they use it differently.

Examples of levels, hierarchies

Reductionism requires the existence of a hierarchy of levels. E.g.

Disciplines: Politics → Sociology → **Psychology** → Neurology → Biology → Chemistry → Physics

Biological groups: Population → Clan or group → **Organism** → Cells → Organelles

Psychological systems: All humans → Nation state → Groups of acquaintance → Family → Dyad interacting → **Individual** → Parts of one person's mind?

Evolution: Natural selection → Genes → DNA

Matter: Materials → Phases of matter (solid, gas, ...) → Molecules → Atoms → Particles (e.g. protons) → Quarks ...

Reductionism

Many feel instinctively that reductionism (type B above) is the best kind of explanation. This is not a rational feeling because:

- a) Each level of explanation can be independent, with its own rules (just like chess is).
- b) A level can sometimes be reduced to more than one alternative lower level e.g. the iPad: its functions, fit into your life, fit with your image; being cool.
- c) Some levels just do NOT reduce to another e.g. especially when they have self-correcting mechanisms (homeostasis).
- d) Above all: whether as individuals or societies, we are all born into the middle of things. We can't wait until a theory for a lower level arrives. Yet we function satisfactorily.

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Reductionism (2)

Some things that currently (2012) don't seem to fit into levels very well:

- a) Lamarckian inheritance, "epigenetic" factors. [cf. start address]
- b) Prions. Is infection a phenomenon independent of organisms as infectious agents?
- c) Migraine [Sacks]. Physiology doesn't precede "psychological" / psychosomatic causes in any clean way.
- d) Genes and learning as causes of behaviour [Hailman]
- e) Geology and biology: life changing the planet, its rocks, its atmosphere, its climate.

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Behaviour as an independent subject?

Genes do not directly control behaviour: they control only proteins and RNA molecules: they don't even control sugars or bones directly. Behaviour is, and must be, shaped mainly by other mechanisms.

So one view of psychology is that it is a level of explanation with a logic mainly independent of the mechanism of natural selection (and genes, and DNA). And probably in the end that is why brains evolved: to get that independence.

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Evolutionary psychology: A contradiction in terms?

Thinking about scope again: one might almost say that psychology is defined as exactly those aspects of being human that are NOT controlled by evolution.

The whole point of perception and learning is so an organism can adapt its behaviour faster than the genome can.

Human behaviour is not inherited, at least not through genes. And that is, presumably, precisely its adaptive evolutionary advantage.

[Jack Hailman]

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Reductionism (3)

We individually as critical thinkers, or a discipline as a whole, has to consider whether and when a reductionist approach is useful and can be made to work. And whether it adds anything. Most often, a discipline is defined by looking at a particular level because the lower levels do not seem likely to help in detail.

In psychology, there are some impulses to try to reduce the 3 types of data to each other e.g. explain behaviour by physiology, the social by individual attitudes. This may work in some cases, but in general the job is to relate them. This probably means finding how the causal links run in both directions, not just in one.

More work on this is probably a good heuristic;

As is looking for self-stabilising systems / feedback loops that make a level relatively self-contained.

E.g. Brain plasticity vs. fixed, determined brain areas

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Psychology ?

Where does Psy fit in the levels of explanation?

Why is it a separate autonomous level?

Politics →

Sociology →

Psychology →

Neurology →

Biology →

Chemistry →

Physics

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Reductionism:

Reductionism in general is the irrational belief that explanations of mechanism are more real than explanations of relationships at one level.

Is chemistry just physics?

Is biology just chemistry?

Is psychology just biology?

⇒ If so then: Psychology is just physics

⇒ If so then: Study physics for the real explanations.

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What is my real point about reductionism?

- We each need a reason for seeing psychology as a discipline, rather than seeing some lower level as holding the real explanations.
- Appreciation of rules at one level, not just reductively
- Emergent phenomena.
- Emergent systems thinking, self-organising systems show patterns that produce patterns and complexity spontaneously. Getting away from thinking that there is just one cause that "explains".

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Critical thinking tip

Are the (3) major types of data (behaviour, physiology, self-reported mental contents) being used reductively to explain each other, or collaboratively?

Look for self-stabilising systems / feedback loops that make a level relatively self-contained.

Test for whether causation runs in both directions?

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