

This document contains slides presented at the conference *Academic Demarcations: Disciplines and Interdisciplinarity*, 13-14 September 2012 at the University of Oslo, **and may only be quoted after informing the author:**

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On Matter and Meaning: Confronting the Challenges of Interdisciplinary Research

Desmond McNeill



SUM

CENTRE FOR DEVELOPMENT
AND THE ENVIRONMENT



“I wanted to argue against the understanding of human life and action implicit in an influential family of theories in the sciences of man. The common feature of this family is the ambition to model the study of man on the natural sciences»

«What is striking about this family of theories is their reductive nature.»

(Taylor, 1985)



«The kind of critique we need is one that can free it (the scientific outlook and the disengaged identity) of its illusory pretensions to define the totality of our lives as agents, without attempting the futile and ultimately self-destructive task of rejecting it altogether.»

«The current vogue, say, of Derrida's later writings is something close to an unmitigated disaster....» (Taylor 1985)



Examples of Disciplines

	I	II
Natural sciences	Chemistry	Ecology
Human sciences	Economics	Anthropology



PHENOMENON STUDIED	'PERSPECTIVE'	
	Matter/entities	Meaning/relations
Inorganic matter	Physics	?
Organic matter	Biology	Environmental philosophy
Body	Chemistry	Gender studies
Mind	Biochemistry	Psychology
Society	Economics	Anthropology
Texts	?	Literary studies





Interdisciplinary research

- **Multi-disciplinary:** autonomy of the different disciplines; does not lead to changes in the existing disciplinary and theoretical structures;
- **Inter-disciplinary:** formulation of a uniform, discipline-transcending terminology or common methodology; cooperation within a common framework shared by the disciplines involved;
- **Trans-disciplinary** (also known as cross-disciplinary): research based on a common theoretical understanding and accompanied by a mutual interpenetration of disciplinary epistemologies.

(Source: OECD 1972)



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Multi-disciplinary research: an example

EU project on the sustainable management of the vicuna.

*(MACS – manejo sostenible de camelidos
silvestres)*



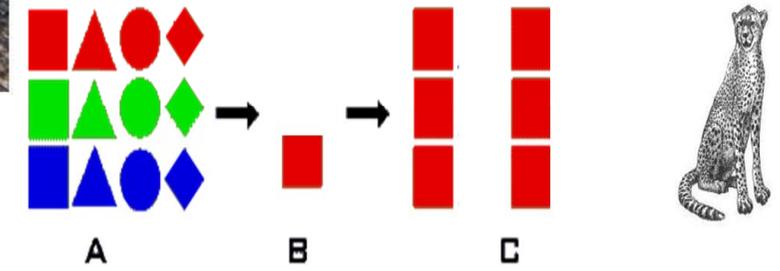
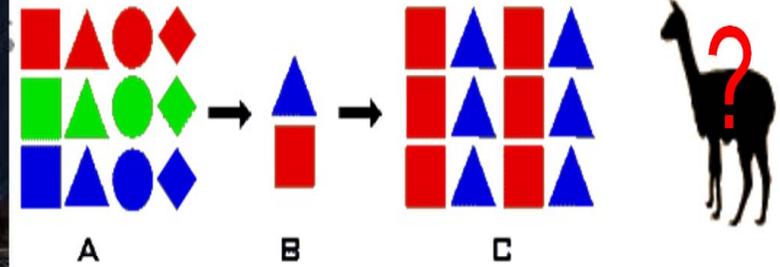
Vicugna vicugna mensalis



Vicugna vicugna vicugna



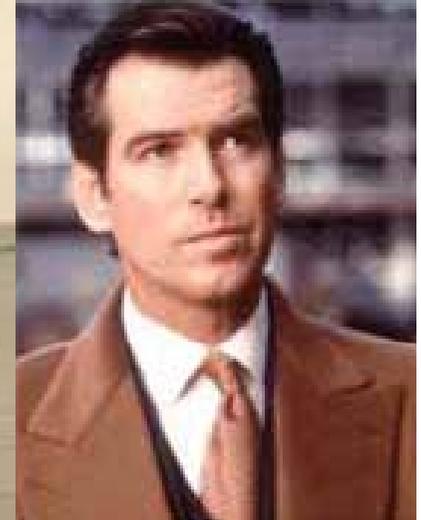






What's so special?

The vicuña bears the highest quality natural textile fibre on earth





The interplay between:

- The phenomenon that is studied
- The theoretical perspective
- The research method



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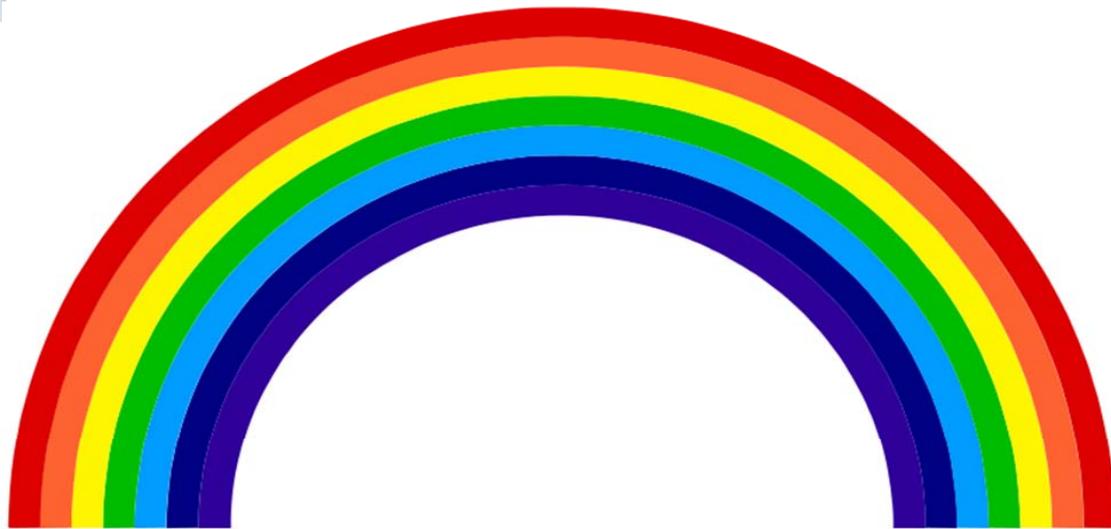


Thick Description

”Consider, he says, two boys rapidly contracting the eyelids of their right eyes. In one, this is an involuntary twitch; in the other, a conspiratorial signal to a friend. The two movements are, as movements, identical; Yet the difference, however unphotographable, between a twitch and a wink is vast; As Ryle points out, the winker has done two things, contracted his eyelids and winked, while the twitcher has done only one, contracted his eyelids. Contracting your eyelids on purpose when there exists a public code in which so doing counts as a conspiratorial signal *is* winking.”

(Clifford Geertz, following Gilbert Ryle)







Rainbow: a natural phenomenon?

A **rainbow** is an optical and meteorological phenomenon that is caused by reflection of light in water droplets in the Earth's atmosphere, resulting in a spectrum of light appearing in the sky. It takes the form of a multicoloured arc.



The apparent discreteness of primary colours is an artefact of the human brain. Newton originally (1672) divided the spectrum in five primary colours: red, yellow, green, blue and violet. Later he included orange and indigo, giving seven primary colours by analogy to the number of notes in a musical scale.



- 'Bagasse' is what remains when sugar is extracted from sugar cane.
- Is bagasse a product, a by-product, or waste?
- Now that sugar cane is grown as a biofuel; are both the sugar and the bagasse products?
- A question of value



Type I	Type II
Thin description	Thick description
Explanation	interpretation
Quantitative	qualitative
Reductionist	holist
Context-free	Context-bound



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Which perspective gives a better
answer?

According to what criterion??

Let us avoid the extremes:



Theory of Everything

The Theory of Everything is a term for the ultimate theory of the universe—a set of equations capable of describing all phenomena that have been observed, or that will ever be observed.

$$i\hbar \frac{\partial}{\partial t} |\Psi\rangle = \mathcal{H} |\Psi\rangle$$

where

$$\mathcal{H} = - \sum_j^{N_e} \frac{\hbar^2}{2m} \nabla_j^2 - \sum_\alpha^{N_i} \frac{\hbar^2}{2M_\alpha} \nabla_\alpha^2$$

$$- \sum_j^{N_e} \sum_\alpha^{N_i} \frac{Z_\alpha e^2}{|\vec{r}_j - \vec{R}_\alpha|} + \sum_{j \ll k}^{N_e} \frac{e^2}{|\vec{r}_j - \vec{r}_k|} + \sum_{\alpha \ll \beta}^{N_j} \frac{Z_\alpha Z_\beta e^2}{|\vec{R}_\alpha - \vec{R}_\beta|}$$

The symbols Z_α and M_α are the atomic number and mass of the α^{th} nucleus, R_α is the location of this nucleus, e and m are the electron charge and mass, r_j is the location of the j^{th} electron, and \hbar is Planck's constant.

“The Theory of Everything”, R. B. Laughlin and David Pines (PNAS, 2000)



Theory of Nothing

- Theory of 'no thing'?
- No theory of anything?

AdChoices

1 2 3 4 14 15 16 17 18

1 H Atomic # 1,00794 Symbol Hydrogen Navn Atomvekt

2 C Fast stoff

3 Li 3 Beryllium 6,941 4 Be 9,012182

5 Hg Væske

6 H Gass

7 Rf Ukjent

8 C Solid

9 Hg Liquid

10 H Gas

11 Rf Unknown

Periodic Table of Elements

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

1 H 2 He

3 Li 4 Be 5 B 6 C 7 N 8 O 9 F 10 Ne

11 Na 12 Mg 13 Al 14 Si 15 P 16 S 17 Cl 18 Ar

19 K 20 Ca 21 Sc 22 Ti 23 V 24 Cr 25 Mn 26 Fe 27 Co 28 Ni 29 Cu 30 Zn 31 Ga 32 Ge 33 As 34 Se 35 Br 36 Kr

37 Rb 38 Sr 39 Y 40 Zr 41 Nb 42 Mo 43 Tc 44 Ru 45 Rh 46 Pd 47 Ag 48 Cd 49 In 50 Sn 51 Sb 52 Te 53 I 54 Xe

55 Cs 56 Ba 57-71 72 Hf 73 Ta 74 W 75 Re 76 Os 77 Ir 78 Pt 79 Au 80 Hg 81 Tl 82 Pb 83 Bi 84 Po 85 At 86 Rn

87 Fr 88 Ra 89-103 104 Rf 105 Db 106 Sg 107 Bh 108 Hs 109 Mt 110 Ds 111 Rg 112 Uub 113 Uut 114 Uuq 115 Uuq 116 Uuh 117 Uus 118 Uuo

For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

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57 La 58 Ce 59 Pr 60 Nd 61 Pm 62 Sm 63 Eu 64 Gd 65 Tb 66 Dy 67 Ho 68 Er 69 Tm 70 Yb 71 Lu

89 Ac 90 Th 91 Pa 92 U 93 Np 94 Pu 95 Am 96 Cm 97 Bk 98 Cf 99 Es 100 Fm 101 Md 102 No 103 Lr

For grunnstoffer uten stable isotoper er massetallet for isotopen med lengst halveringstid oppgitt i parentes.

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57 La 58 Ce 59 Pr 60 Nd 61 Pm 62 Sm 63 Eu 64 Gd 65 Tb 66 Dy 67 Ho 68 Er 69 Tm 70 Yb 71 Lu

89 Ac 90 Th 91 Pa 92 U 93 Np 94 Pu 95 Am 96 Cm 97 Bk 98 Cf 99 Es 100 Fm 101 Md 102 No 103 Lr



'But in quantum theory an elementary particle is not an independently existing unanalyzable entity. It is, in essence, a set of relationships that reach outward to other things.'

(Stapp, 1971. "S-Matrix interpretation of quantum theory" Physical Review, 3/6)



Let us avoid disciplinary imperialism

“Becker has played the major role in leading the invading force, applying neoclassical economics to a range of non-economic problems such as education, the family, crime, and addiction. As he puts it himself, “Economic imperialism” is probably a good description of what I do’ (Becker 1990, p.39).”



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Marx and Freud

The study of 'Matter' or 'Meaning'?



Marx on exchange value

"A simple geometrical expression will make this clear. In order to calculate and compare the areas of rectilinear figures, we decompose them into triangles. But the area of the triangle itself is expressed by something totally different from its visible figure, namely, by half the product of the base multiplied by the altitude. In the same way the exchange-values of commodities must be capable of being expressed in terms of something common to them all, of which they represent a greater or less quantity." (Capital I: 45)



"A sugar-loaf being a body, is heavy, and therefore has weight: but we can neither see nor touch this weight. We then take various pieces of iron, whose weight has been determined beforehand. The iron, as iron, is no more the form of manifestation of weight than is the sugar-loaf. Nevertheless, in order to express the sugar-loaf as so much weight, we put it into a weight-relation with the iron. ."
(Capital I: 62)



"To borrow an illustration from chemistry, butyric acid is a different substance from propyl formate. Yet both are made up of the same chemical substances ... in like proportions, namely $C_4H_8O_2$." (Capital I: 57)



"For to stamp an object of utility as a value is just as much a social product as language."
(Capital I: 79)

"Language as the product of an individual is an impossibility. But the same holds for property." (Grundrisse: 490)



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Freud and the mind/body question

Siri Hustvedt:

“The Shaking Woman *or* A History of
My Nerves”



- “Even the Diagnostic and Statistical Manual of Mental Disorders states that the difference between mental and physical is ‘a reductionistic, anachronism of mind/body dualism”. (14)
- “He (Freud) was neither reductionist nor a dualist: “The psyche is, therefore, a process parallel to the physiological, a dependent concomitant”. Freud remained a materialist all his life. ... At the same time, following Kant, he did not believe it was possible to know things-in-themselves. Our access to the world comes only through our perceptions of it, he argued.” (18)



“The New York Times published an article entitled ‘Is Hysteria Real? Brain Images Say Yes’. The unarticulated argument is that if a hysterical paralysis or seizure shows up on a brain scan , an illness once thought to be ‘all in your head’ is actually in your body, and if it’s in your body, its ‘reality’ is confirmed.” (33)



“The mind/body problem is still so vexing, so entrenched as a duality that it becomes almost impossible to think without it. This split, after all, created the distinction between psychiatry and neurology: sick minds versus sick brains. Hysteria, once within the providence of neurology, was pushed into psychiatry. ... The issue here is again one of perception and its frames, disciplinary windows that narrow the view” (79)



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- Analogy and stories
- The contrast between explanation and interpretation



Freud

- “It still strikes me as strange that the case histories I write should read like short stories and that, as one might say, they lack the serious stamp of science.” (21)
- “The Diagnostic and Statistical Manual of Mental Disorders does not tell stories. ... Its mission is ... to collect symptoms under headings that will help a physician diagnose patients. ... There is a companion DSM-casebook (where) narratives about real doctors and patients are gathered in their own volume.... The fact is that all patients have stories, and those stories are part of the *meaning* of their illness.” (36)



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Stories from Aidland



The stories in this series will illustrate important challenges faced by those working in the field of development. They will be more than just anecdotes. They will be *empirically well grounded*, based on serious research, and *representative*, providing an illustration of some general issue of significance. Each story will be followed by a comment written by an independent reviewer

who will seek a middle ground between uncritical optimism and negative cynicism.

With these stories and comments, *The Broker* wishes to communicate what might be called 'wisdom' – the wealth of practical knowledge and experience accumulated over the years – in order to counter the generalizations that permeate most public and academic discussions on aid effectiveness.

- More than just anecdotes: *empirically well grounded, and representative.*
- Challenge the dominance of quantitative statistical information as the sole, authoritative source of knowledge.
- Treat ‘representative stories’ on a par with representative samples.
- Communicate what might be called ‘wisdom’, through ‘insights’.