

Realising Research

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Critical Realism as an Underpinning Philosophy for IS
and Management Research

John Mingers Kent Business School
email: j.mingers@kent.ac.uk

MAKING
CONNECTIONS/
IMPACTING
ON FUTURES

1. Problems in the Philosophy of Management Research

- Management research, particularly in the U.S., was long dominated by *positivism* (more generally *empiricism*)
 - Several surveys have demonstrated the preponderance of positivist research in IS journals (Orlikowski, Walsham, Nandhakumar, Mingers).
- During the 1980s, an alternative tradition arose from social science - *interpretivism* (more generally *conventionalism*).
 - Major journals, e.g., MISQ are now encouraging this approach (Lee, Myers, Walsham, Jones)
- Other approaches include a *critical* perspective (Lyytinen, Truex, Ngwenyama, Mingers, Klein) and *postmodernism* (Robinson, White).

- Within the management discipline there are different views about this diversity of paradigms:
 - *Isolationism*: Burrell and Morgan identified four supposedly irreconcilable paradigms. They are seen as equal but research should follow a single paradigm.
 - *Imperialism*: Many people believe in the superiority of a particular paradigm, usually positivism. Benbasat and Weber argue the need for disciplinary conformity.
 - *Pluralism*: Accepts the need for a variety of paradigms within the discipline or for particular research projects:
 - Complementarism (e.g. Robey) sees different methods as being more appropriate for different research questions
 - Strong pluralism (e.g. Mingers) argues for combining methods within a research project

2. Problems for Realism

Naïve realism (*even in natural science*) has been under constant attack at least since Hume and Berkeley, in particular from *empiricism* and *conventionalism (idealism)*

1. Empiricism: the validity of scientific knowledge rests on **empirical events**, and explanations of these events in terms of general or “covering” laws. This assumes:

- a Observation is *objective* and unproblematic.
- b Humean causal principle: *constant conjunction* of events.
- c No “unobservable” entities: *perceptual* criterion of existence.
- d *Induction* of universal laws from particular instances.
- e *Unity* of method across natural and social science.

With IS this is very much the traditional approach - collect data often by experimentation survey etc, analyse data statistically, make predictions, refute/confirm hypotheses.

- Problems especially with a) and d) led to the standard hypothetico-deductive method of Hempel and Popper.

2. **Conventionalism:** many forms that all emphasize the extent to which human experience, judgment and convention is involved in scientific activity rather than it being purely “objective”.
 - **Pragmatism:** science is essentially a practical activity; consensus theory of truth; the meaning of a concept depends on its practical effects.

Instrumentalism: theories are simply instruments for prediction and have no truth content. “*We do not ask if it is true, only if it works*” (Raitt)
 - **Sociology of science:** studies the way science is actually carried out and shows to a greater or lesser extent that it depends on social and political practices. E.g., Kuhnian paradigms seen as incommensurable
 - **Sociology of knowledge,** social construction of technology; actor network theory all seek to show how knowledge gets accepted in a scientific community.

- 3. Natural Science and Social Science:** remains a highly contentious issue:
- **Naturalism:** there is a general unity of scientific method across all domains. Critical Realism (as opposed to positivists) hold to a *modified* naturalism.
 - **Anti-naturalism:** sees the social world as intrinsically different to the natural, being constituted through language and meaning - e.g., ethnography, ethnomethodology, phenomenology, social constructivism. Social objects do not have an independent existence and cannot be known except subjectively. (Boland, Rathswohl)
 - **Extreme irrealism:** denies the possibility of objective knowledge in either domain, e.g, strong sociology of knowledge, postmodernism and extreme constructivism. (Ciborra, Robinson et al)

3. Introduction to Critical Realism

CR has been developing since the 1970s in response to the anti-realist developments in philosophy. Primarily Roy Bhaskar, but also others such as Keat, Urry, Norris and Archer. Has attracted much attention in recent years in sociology, economics, geography, international relations and management

It aims to:

- 1 Re-establish a realist view of *being* in the ontological domain whilst accepting the relativism of knowledge as socially and historically conditioned in the epistemological domain;
- 2 Argue for a modified naturalism in social science;
- 3 Develop the idea of explanatory critique as a way of re-uniting facts and values, and recognising that social theory is inevitably transformative.
- 4 Recast this in a dialectical form

Major Literature

- 1975 *A Realist Theory of Science*: Concerned with natural science (**transcendental realism**)
- 1979 *The Possibility of Naturalism*: Concerned with social science (**critical naturalism**)
- 1986 *Scientific Realism and Human Emancipation*: Argues for emancipatory critique (**critical realism**)
- 1989 *Reclaiming Reality*: General overview, includes critiques of Fereyabend, Bachelard, Rorty
- 1993 *Dialectic: The Pulse of Freedom*: Recasts the whole theory in terms of dialectics. Introduces the MELD model. (**dialectical critical realism**)
- 1994 *Plato Etc.*: A short and dense version of Dialectic
- 2000 *From East to West*: Attempts a link to Eastern philosophy and religion
- 2002 *From Science to Emancipation*: Readable overview based on lectures plus several debates and discussions
- 1998 *Critical Realism: Essential Readings*: Best introduction with excerpts from Bhaskar plus commentary and essays (by Archer et al)
- 2007 *Dictionary of Critical Realism* (Hartwig, M.)
- 1995 *Realist Social Theory: The Morphogenetic Approach* (Archer, M.)
- 2000 *Realism and Social Science* (Sayer, A.)

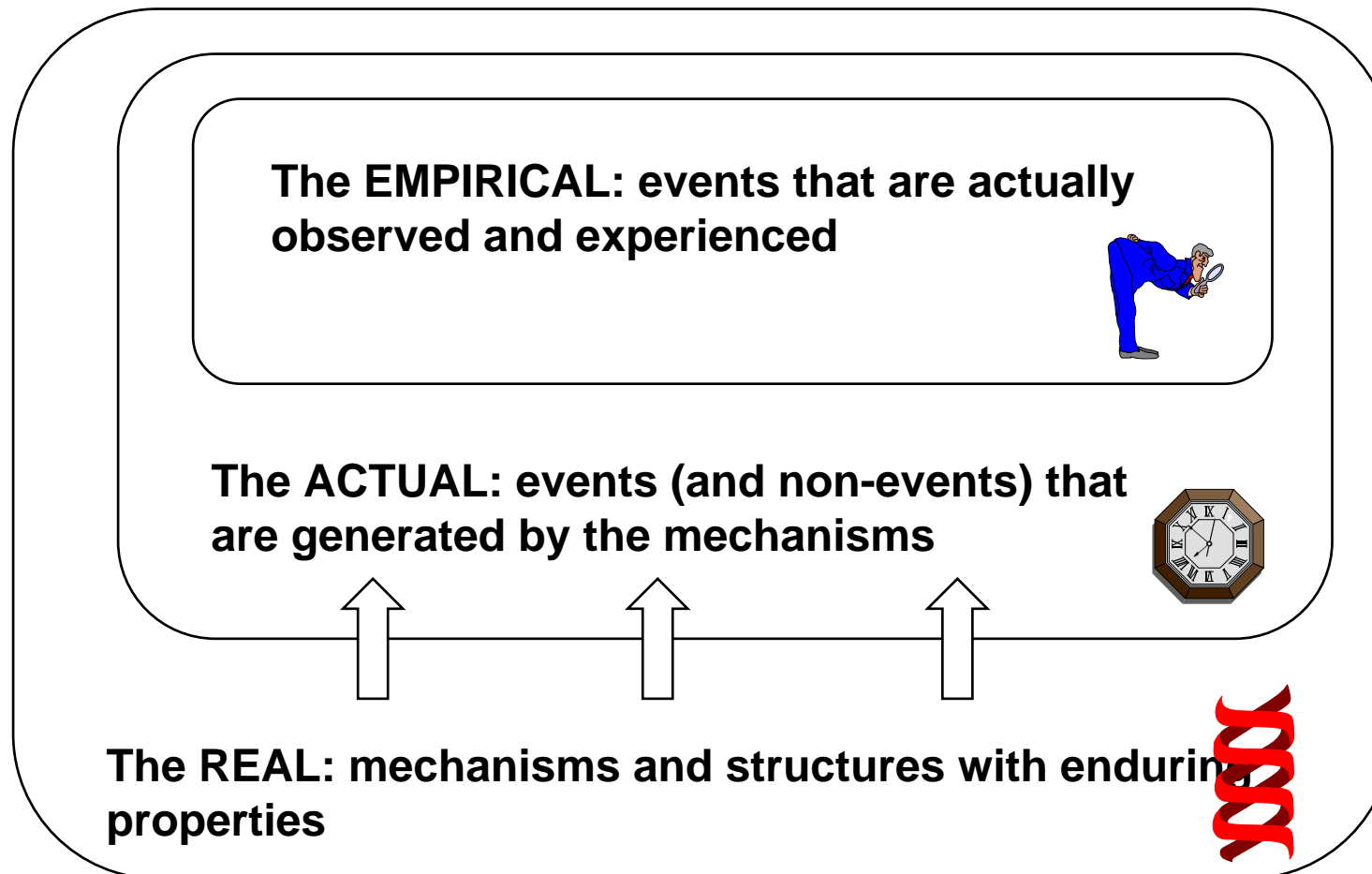
3.1 Arguments for a Stratified Ontology

- CR adopts a policy of *immanent critique* and *transcendental argument*. Take something that is accepted by an opposing position; show that it is inexplicable or contradictory within that position; ask what the world must in fact be like for it to occur.
- Both empiricism and some forms of idealism accept perceptual experience and the success of experimental activity:
 - Perception is essentially corrigible thus there must be a **domain of events independent of our experiences**
 - Experimenters bring together certain conditions but do not thereby *cause* the results. Experiments may fail; the results can be repeated outside the experiment; generally constant conjunctions are quite rare. Thus there must be a **domain of causal laws or mechanisms separate from the events that they generate**.
 - Empiricism thus involves a double reduction - that of causal mechanisms to events, and that of events to experiences.

- Both empiricism and idealism suffer the *epistemic fallacy* - reducing the ontological domain of existence to the epistemological domain of knowledge, that is, limiting *being* to our human *knowledge* of being.
 - For the empiricist that which cannot be experienced cannot be - a *perceptual* criterion for existence.
 - For the conventionalist limitations on our *knowledge* are taken to be limitations on being itself.
- In contrast, CR uses a *causal* criterion for existence. There must be enduring entities or structures, physical, social or conceptual, observable or not, that have powers or tendencies to act in particular ways. Their continual interaction generates the domain of events, both those that occur and those that do not
 - Powers may exist without being exercised (needing to be triggered).
 - Powers may be exercised but not be manifest in events (because of countervailing operations).

3.2 The Primary Distinctions

A) The Real, the Actual, and the Empirical



B) The Intransitive and Transitive Domains

The real, the objects of our knowledge, constitute the *intransitive* domain of science. They are independent of us. Even speech becomes intransitive after it is uttered (*referential detachment*).

The production of knowledge, however, is the work of humans who produce and refine the *transitive* objects of knowledge - theories, results, anomalies, journals etc. This aspect is clearly a social process.

This distinction allows us to

- **accept** *epistemic relativity* - i.e., that knowledge is always historically and socially located,
- but **reject** *judgmental relativity* - i.e, that all views are equally valid with no rational grounds for choosing between them.

3.3 Methodology of Critical Realism

The methodology is one of *retroduction* (abduction cf Peirce)

- **Description** of the phenomena in a way that makes it theoretically significant, that is that makes it relevant to the concepts or issues of some particular theory(ies).
- **Retroduction** - the postulation of a hypothetical mechanism(s) or structure(s) that, *if they existed*, would generate the observed phenomenon. The structure could be physical, social or psychological, conceptual and may well not be directly observable except in terms of its effects (e.g., social structures).
- **Elimination** of alternative explanations and attempts to demonstrate the existence of the mechanism by experimental activity or by the prediction of other phenomena or events.
- **Identification** of the correct generative mechanism from those considered, and appropriate development to the theoretical base.

3.4 Critical Realism and Social Science

CR maintains a modified naturalism - there are real, intransitive social structures but they have different characteristics to material phenomena.

- **Ontological**

- They only exist in their effects and the activities they govern.
- do not exist independently of the agents' conceptions of what they are doing.
- are localised in both space and time - not universal.

- **Epistemological**

- They are inherently interactive and open - difficulty of prediction.
- Social phenomena are inherently meaningful and so cannot properly be measured and compared, only understood and described.

- **Relational**

- Social science is itself a social practice and is, therefore, inherently self-referential. It has effects and must be self-consistent.

4. Critical Realism and Management

- CR is highly appropriate for management because:
 - It validates a realist stance (which most management researchers would hold) whilst accepting the significant criticisms of naïve realism.
 - It addresses natural and social science (and indeed critical) and has the potential to reconcile hard and soft approaches.
- I will look at two methods:
 - Statistical analysis, especially regression, which is empiricist.
 - Soft Systems Methodology which is interpretivist/phenomenological

4.1 Statistical Modeling

Statistical modeling is essentially empiricist - constructing equations that link empirical observations. Consider multiple regression which is claimed to be a causal method. In practice (e.g., econometrics) its predictive ability is very poor - why?

- It has an impoverished notion of (Humean) causality, remaining in the empirical domain and not seeking underlying causal mechanisms - cf correlation coefficient only measures statistical association not causality.
- Implicitly assumes closure - the stability of the coefficients and statistics rests on assumptions that the residual variation is small and random. In practice, major causal factors will have been excluded.
- The main assumptions normality, linearity, independence, are extremely implausible so the whole idea of hypothesis testing makes no sense.
- It is extremely difficult to choose between competing models on statistical grounds alone, so “experience”, usefulness, and “intuition” come into play.
- The data itself is usually extremely unreliable even where measurement is possible and should be seen as an outcome as much as an input.

Statistical modeling can be used within a CR perspective:

- As an exploratory tool for detecting patterns that then need explaining by more substantive investigations.
- Some techniques such as factor analysis can identify potential underlying structures.
- Validating potential explanations through data analysis and experimentation.
- Combining with other types of research methods especially intensive ones.
- In practice, many real OR projects do use it in this way.

4.2 Soft Systems Methodology

SSM sees itself as essentially phenomenological therefore denying the ontological reality of “systems” in favour of epistemology, and distinguishing strongly between natural and social science. From a CR perspective:

- SSM explicitly commits the epistemic fallacy of reducing the ontological to the epistemological.
- It takes the only alternative *social* science philosophy to be positivism. By adopting CR it could recognize social *reality* as well as the inherent meaningfulness of social interaction.
- SSM has been criticized for accepting all viewpoints as equally valid. Within CR we can accept epistemic relativism without accepting judgmental relativism.
- SSM is largely idealist (e.g., RDs and CMs) but in CR ideas and concepts are equally as real as physical objects since they can have causal effects on the world and are themselves social products. Ideas once expressed are no longer subjective but become intransitive and available for investigation.
- CR also allows exploration of why particular viewpoints may be held and the social and psychological structures impeding or facilitation change.

5. Conclusions

- Critical realism provides a comprehensive and consistent philosophy of both natural and social science, thus giving the potential for integrating both hard and soft approaches in IS
- It maintains a basically realist ontological stance whilst accepting the epistemological limitations of observing and knowledge
- Methodologically, it supports a pluralist approach (*Multimethodology*) which has a place for both qualitative and quantitative research methods. It does not accept either purely positivist or purely interpretive research.

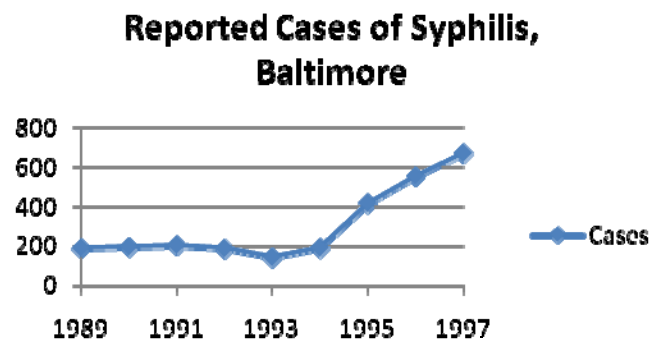
For recent examples in IS see:

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- Hevner, A., Chatterjee, S., and Carlsson, S.A. 2010. "Design Science Research in Information Systems: A Critical Realist Approach," in *Design Research in Information Systems*, 22, Springer US, pp. 209-233.
- Longshore Smith, M. 2006. "Overcoming theory-practice inconsistencies: Critical realism and information systems research " *Information and Organization* (16:3), pp. 191-211.
- Mingers, J. 2004c. "Re-establishing the real: critical realism and information systems research," in *Social Theory and Philosophical for Information Systems*, J. Mingers and L. Willcocks (eds.), London: Wiley, pp. 372-406.
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- Mingers, J. and Walsham, G. 2010. "Towards ethical information systems: The contribution of discourse ethics" *MISQ* (34,4), pp. 833-854
- Mutch, A. 2010. "Technology, organization and structure - a morphogenetic approach," *Organization Science* (21:2), pp. 507-520.
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- Zachariadis, M., and Scott, S. 2007. "Diversity in IS research: Developing a mixed methodology approach to understanding the business value of payment system innovations in financial services," *Proceedings of the ICIS 2007*, <http://aisel.aisnet.org/icis2007/74>.

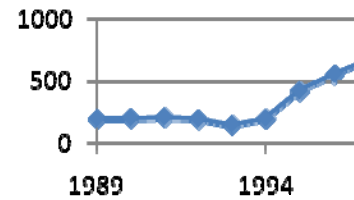
Plus MISQ Special Issue on CR

Example – Tipping Point (Gladwell)

- In Baltimore in 1995 there was a sudden explosion of syphilis and sexually transmitted diseases
- This was completely unexpected and difficult to understand. Three explanations were proposed:
 - Center for Disease Control – increased use of crack cocaine
 - Zenilman (John Hopkins) – breakdown of medical services through budget cuts
 - Potterat (El Paso) – spread of sexual activity through slum clearance



The EMPIRICAL: events
that are actually observed
and experienced



The ACTUAL: events
(and non-events) that are
generated by the
mechanisms



The REAL:
mechanisms and
structures with
enduring properties



Methodology

- **Description:** The sudden rise in cases
- **Retroduction:** Three hypothetical causal mechanisms
- **Elimination:** Research to see which if any could actually be responsible for the effects.
Observations, modelling, comparisons, testing etc
- **Identification:** of the correct one or combination of several

