Interdisciplinary Research in a Critical Realist Perspective, Theory and Practice

IACR 21st Annual Conference
Lillehammer 2018-08-29

Berth Danermark
Conference Theme:

Sustainability, Interdisciplinarity and Transformative Change: A Critical Realist Response to the Crisis System
CONTENT

What is interdisciplinary research
Interdisciplinary research and meta-theory
Integration of knowledge
Praxis/Intervention/Predictions
Personal background:
Herman Hesse, Mario Bunge and Roy Bhaskar
HERMAN HESSE (1877-1962)

"The Nobel Prize winner Hermann Hesses’ books have for a long time been common in the pockets of high school students. An naturally steep in the process of formation of an intellectual."

Dagens Nyheter 2005-11-03
The Glass Bead Game

*The Glass Bead Game* is the last full-length novel of Hesse. It was begun in 1931 and published in Switzerland in 1943 after being rejected for publication in Germany due to Hesse's anti-Fascist views. A few years later, in 1946, Hesse went on to win the Nobel Prize in Literature. The Swedish Academy said that the novel "occupies a special position" in Hesse's work. Playing the game well requires years of hard study and the game is essentially an abstract synthesis of all arts and sciences. It proceeds by players making deep connections between seemingly unrelated topics. The Glass Bead Game is "a kind of synthesis of human learning".
Some points in *The Glass Bead Game*

The aim of the game is to overcome the *fragmentation of knowledge*

History, natural and social sciences and human´s experiences shall be brought together and create a new *holistic understanding* of the world.

Hesse’s ontology: the *reality is layered* which makes it possible to play the game, i.e. to unify the knowledge.

Hesse’s epistemology acknowledges that every level (storey) has developed its own language. And in the game we develop a *new mode of communication* which enable us to understand each other over disciplinary boundaries (in my words: crossdisciplinary understanding).
MARIO BUNGE (1919 - )

The unifying thread of Mario Bunge’s scholarship is the constant and vigorous advancement of the Enlightenment Project, and criticism of cultural and academic movements that deny or devalue the core planks of the project: namely its naturalism, the search for truth, the universality of science, rationality, and respect for individuals. His thinking embodies global systemism, emergentism, rationalism, scientific realism, materialism and consequentialism. Bunge has repeatedly and explicitly denied being a logical positivist, and has written on metaphysics. In the political arena, Bunge has defined himself as a "left-wing liberal" and democratic socialist.

(Wikipedia, 2018-05-17)
Interdisciplinarity, systemism and mechanisms

Bunge’s philosophical mission is to help restore the unity of knowledge in an age ... when the unity of sciences is threatened from from within by their fast-paced growth and increasing specialization. (Andreas Pickel. Mario Bunge’s philosophy of science. *Society, 2001, 38, 4:71*)

Four basic systems: (biological, economical, political and cultural). An interaction of mechanisms between these systems.

Mechanisms are processes which create, reproduce, transform or break down a system.
A tentative critical realist informed definition of interdisciplinary research:

Interdisciplinary research is any study or group of studies undertaken by scholars from all relevant levels that are needed in order to answer the research question. The research is integrating analysis of structures, mechanisms, and outcomes at these levels by using study design and methodology that are most appropriate for respective levels. The output is knowledge emergence, which requires the use of skills of the involved researchers throughout multiple phases of the research process.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Problems</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metatheoretical</td>
<td>No common team philosophy</td>
<td>A common metatheoretical approach unifies interdisciplinary teams</td>
</tr>
<tr>
<td>Theoretical</td>
<td>The idea of incommensurability; reductionism</td>
<td>Integration of knowledge; non-reductionism</td>
</tr>
<tr>
<td>Methodological</td>
<td>Methodological imperialism</td>
<td>Methods are specific to the level of the analysis (there is specificity and pluralism in methods)</td>
</tr>
<tr>
<td>Individual</td>
<td>No communication between researchers</td>
<td>Communication is based on mutual understanding of interdisciplinarity and respect for knowledge from other disciplines; individuals have an interdisciplinary education</td>
</tr>
<tr>
<td>Administrative</td>
<td>Universities tend to be organised along mono-disciplinary lines; lack of interdisciplinary career pathways and incentives</td>
<td>Universities have a supportive administrative structure; clear career pathways and incentives for interdisciplinary researchers.</td>
</tr>
<tr>
<td>Financial/Funding</td>
<td>Funding bodies cannot cope with interdisciplinary proposals</td>
<td>Interdisciplinary proposals are evaluated using transparent criteria informed by metatheory that is equivalent across disciplines</td>
</tr>
</tbody>
</table>
Three domains of reality (empirical, actual and real)
Levels of reality
Emergence
Non reductionism
Mechanisms & causality
Open and closed systems
Retroduction
Transitive & intransitive
Figure 2. Structures, mechanisms and events

Source: Sayer 1992: 117
Heavy water, formally called deuterium oxide

A form of water that contains the hydrogen isotope deuterium, (D), contains protium isotope \(^2\text{H}_2\text{O}\) or \(\text{D}_2\text{O}\)

This difference increases the strength of water's hydrogen-oxygen bonds, and this in turn is enough to cause differences that are important to some biochemical reactions
Disability and position on labour market – a biopsychosocial perspective

Biological structures and mechanisms (e.g. hearing loss, psychiatric disorder)

Psychological structures and mechanisms (e.g. trust, cognition, self-esteem)

Social structures and mechanisms (e.g. discrimination, wage allowances, quota-system, accessibility)
Necessarily laminated system

(vii) normative kinds of mechanisms
(vi) cultural and
(v) socio-economic
(iv) psycho-social
(iii) psychological
(ii) biological, and more specifically physiological, medical or clinical
(i) physical

Roy Bhaskar & Berth Danermark: Metatheatery, Interdisciplinarity and Disability Research: A Critical Realist Perspective
REDUCTIONISM

In a classic intellectual dispute between E. O. Wilson and Stephen J. Gould:

Wilson: Interdisciplinary coordination involves reducing problems of study in the social and cultural world (e.g., social behavior, art, and technology) to their basic bio-chemical components (e.g., the neurological categories that might explain the social or creative experience).

Gould critiques Wilson’s proposed reductionism and argues that the best interdisciplinary work recognizes the intrinsic differences in disciplinary forms of knowledge, each embracing a unique [and often complementary] form of explanation.
Physicalism (*First published Tue Feb 13, 2001; substantive revision Mar 9, 2015*)

Physicalism is the thesis that everything is physical, or as contemporary philosophers sometimes put it, that everything supervenes on the physical. … The general idea is that the nature of the actual world (i.e. the universe and everything in it) conforms to a certain condition, the condition of being physical. Of course, physicalists don't deny that the world might contain many items that at first glance don't seem physical — items of a biological, or psychological, or moral, or social nature. But they insist nevertheless that at the end of the day such items are either physical or supervene on the physical.

(Source: [Stanford Encyclopedia of Philosophy](http://plato.stanford.edu))
Imagine Mary, a famous neuroscientist confined to a black and white room. Mary is forced to learn about the world via black and white television and computers. However, despite these hardships Mary learns (and therefore knows) all that physical theory can teach her. Now, if physicalism were true, it is plausible to suppose that Mary knows everything about the world. And yet — and here is Jackson's (1986) point — it seems she does not know everything. For, upon being released into the world of color, it will become obvious that, inside her room, she did not know what it is like for both herself and others to see colors — that is, she did not know about the qualia instantiated by particular experiences of seeing colors.

Following Jackson (1986), we may summarize the argument as follows:

P1. Mary (before her release) knows everything physical there is to know about other people.

P2. Mary (before her release) does not know everything there is to know about other people (because she learns something about them on being released).

Conclusion. There are truths about other people (and herself) that escape the physicalist story.

(Source: Stanford Encyclopedia of Philosophy)
Levels

Integration

Praxis

Effective epistemic integration of knowledge in a holistic perspective
Ontology (intransitive dimension)

(disambiguation)

Epistemology (transitive dimension)

Discipline 1
Discipline 2
Discipline 3

Disciplinary/reductionist phase
Multidisciplinary phase
(cross-disciplinary understanding)

Interdisciplinary teamwork phase

Integrated understanding/result (interdisciplinary integration)

The object for interdisciplinary research

Epistemic about the object

Emergence

Integration

$\text{disciplinary/reductionist phase}$

$\text{multidisciplinary phase}$

$\text{interdisciplinary teamwork phase}$

$\text{integrated understanding/result}$ (interdisciplinary integration)
The Swedish Institute for Disability Research

Our disability research strategy sets the focus on the complex interplay between bio-psycho-social levels, which in the long term are assumed to provide the greatest explanatory and application values. This further implies that we endorse:

- Research that gives priority to horizontal and vertical integration and explanation of phenomena.
- Research that combines several different research methods and approaches.
- Research that gives priority to a mechanism-driven longitudinal approach.
- Bio-psycho-social approaches that are highlighted in research training and supervisor education.

Our focus is to increase the knowledge about disability in society and thus contribute to improve the situation of persons with disabilities.

https://liu.se/ihv/
Occurrence of interdisciplinary, % (41 doctoral thesis, 2000-2012)

Without interdisciplinary 7,3
Minor interdisciplinary 29,3
Moderate interdisciplinary 36,6
Strong interdisciplinary 26,8

THE STAGES OF INTERDISCIPLINARITY

Ontology:
1. A multiplicity of causes – implied by the open-system of the world
2. A multiplicity of structures and/or mechanisms

Epistemology:
3. A multiplicity of theories – each corresponding to the different mechanisms and structures
4. The multiplicity of disciplines – in a social context explanations is likely to extend beyond a single discipline
CONDITIONS FOR INTERDISCIPLINARITY

1. Disambiguation of the ontological and epistemological to ensure clarity about the claims that one is making about the world
2. Metatheoretical unity: Critical realism
3. Methodological specificity: methodology specific to a particular discipline
4. Theoretical pluralism and tolerance: tolerant with respect to other disciplines. Tolerant within the own discipline
5. The educational process has to be changed
6. Dissolve the professional barriers
PRAXIS – INTERVENTION – PREDICTIONS

Change the structure
Abolish boosting mechanisms
Create counteracting mechanisms

Doing this presupposes knowledge based on S+M+I+C=O
S+M+I+C=O

CONTEXT (structures and mechanisms)

Mechanisms

Structures

Intervention

OUTCOME
REDUCTIONISM IN INTERVENTION

Focusing only one or just a few mechanisms, e.g. changing attitudes, knowledge

Not focusing the most important aspects, e.g. persons not structures, agreements not actions


Thank you for your attention