Meta-narrative review

Henry W. W. Potts

CHIME (Centre for Health Informatics and Multiprofessional Education), Institute of Epidemiology & Health Care, UCL

With thanks to Trish Greenhalgh, Geoff Wong & others
Traditional systematic review

Now well established as a central method in evidence-based medicine (EBM)
Quantitative outcomes fit meta-analysis and illustrated with the familiar forest plot
Works best when comparing like with like
Small degree of methodological heterogeneity can be handled with sub-group analyses
Not just heterogeneity, not just mixed methods,
but incommensurability

The article explores the advent of information and communication technology in midwifery, and how gender symbols and services combine to produce what has been described as the "development of electronic services." In particular, midwives are increasingly using computers, seeing IT work as a "philosophy of midwifery." Their work has been affected by the proliferation of nonintegrated information systems, resulting in considerable frustration among users and information technology personnel. Consequently, there have been many integration efforts, which typically include some or all of the four principle classes of hospital-based systems: electronic patient records, laboratory systems, radiology systems, and patient administrative systems. In this study, we pose the implementation process during most of the...
The meta-narrative approach

Heterogeneity and pluralism

Problems of heterogeneity multiply with more complex questions, with multiple outcomes, varying systems and different methodologies – different paradigms

Various approaches developed to review broad methods

Meta-narrative review

The Wright brothers: first powered, heavier-than-air flight, 1902
Du Temple’s monoplane: achieved short hop using a sloping ramp in 1874.

Clément Ader’s Avion III: Ader achieved a short hop in 1890, poorly controlled, length disputed.

CR Nyberg’s Flugan: achieved a few short hops in 1897.

Wilhelm Kress’s Drachenflieger: short hops in 1901.

... but many others were close. Likewise, this is an emerging field and there is similar work from other groups.
Related approaches

Moran-Ellis et al. (Qual Res 2006;6(1):45-59):

“Researchers who advocate the use of multiple methods often write interchangeably about ‘integrating’, ‘combining’ and ‘mixing’ methods, sometimes eliding these descriptors with ‘triangulation’, which itself encompasses several meanings. In this article we argue that such an elision is problematic since it obscures the difference between (a) the processes by which methods (or data) are brought into relationship with each other (combined, integrated, mixed) and (b) the claims made for the epistemological status of the resulting knowledge.”


‘Composite analysis’: retain integrity of each method – integrate findings rather than ‘mixing methods’

Noblit & Hare (Meta-ethnography: Synthesising Qualitative Studies, 1988):

Distinction between integrative and interpretive reviews
Meta-narrative review – key principles

Use a historical and philosophical perspective as a pragmatic way of making sense of a diverse literature

• Pragmatism
• Pluralism
• Historicity
• Contestation
• Peer review
Key questions (from Kuhn, “The structure of scientific revolutions”)

• What research teams have researched this area?
• How did they CONCEPTUALISE the problem?
• What THEORIES did they use to link problem with potential causes and impacts
• What METHODS did they define as ‘rigorous’ and ‘valid’?

Application more post-Kuhnian than Kuhnian
Explore the literature

Research tradition A
- Theoretical basis
- Quality criteria
- Evaluate, summarise

Research tradition B
- Theoretical basis
- Quality criteria
- Evaluate, summarise

Research tradition C
- Theoretical basis
- Quality criteria
- Evaluate, summarise

Meta-narrative map of underpinning traditions

Meta-narrative review (how to get started)
Separating the literature into piles
Synthesis phase

Highlight similarities and differences in the findings from different traditions

Contestation between the disciplines is data (and leads to higher order constructs)

Offer conclusions of the general format “in circumstances such as X, don’t forget to think about Y”
<table>
<thead>
<tr>
<th>Research tradition</th>
<th>Disciplinary roots</th>
<th>Definition &amp; scope</th>
<th>General format of research question</th>
<th>EPR conceptualised as...</th>
<th>EPR user conceptualised as...</th>
<th>Context conceptualised as...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health information systems</td>
<td>(Evidence-based) medicine, computer science</td>
<td>Study of storage, computation &amp; transmission of clinical data. Focus often on benefits of EPRs and how to achieve them</td>
<td>What is impact of technology X (EPR, DSS, etc.) on process Y (e.g. clinician performance) and outcome Z?</td>
<td>Container for information about patient; tool for aggregating clinical data for secondary uses</td>
<td>Rational decision-maker whose cognitive ability sets limits to what can be achieved without computers</td>
<td>Potential confounder which can be ‘controlled for’ if right study design used</td>
</tr>
<tr>
<td>Change management (within health services research)</td>
<td>(Evidence-based) medicine, social psychology, management</td>
<td>Study of achieving organisation-level change in healthcare</td>
<td>How can we improve delivery of healthcare and sustain improvement?</td>
<td>Innovation that, if implemented widely and consistently, will improve process and outcome of care</td>
<td>‘Resistant’ agent who must be trained and incentivised to adopt new technologies and ways of working</td>
<td>External milieu of interacting variables that serve as barriers or facilitators to change efforts</td>
</tr>
<tr>
<td>Information systems (positivist)</td>
<td>Business studies, psychology, computer science</td>
<td>Study of how organisations do or do not adopt &amp; assimilate information systems</td>
<td>What factors (independent variables) account for success or failure (dependent variable) of information system X in organisation Y?</td>
<td>Unwelcome change, likely to be resisted, and which may fit poorly with organisational structures &amp; systems</td>
<td>Potential adopter who may engage with or resist change; member of group whose power base may be enhanced or threatened</td>
<td>External milieu of interacting variables that mediate or moderate the relationship between input and output variables</td>
</tr>
<tr>
<td>Research tradition</td>
<td>Disciplinary roots</td>
<td>Definition &amp; scope</td>
<td>General format of research question</td>
<td>EPR conceptualised as...</td>
<td>EPR user conceptualised as...</td>
<td>Context conceptualised as...</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------</td>
<td>--------------------</td>
<td>------------------------------------</td>
<td>--------------------------</td>
<td>-----------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Information systems (interpretivist)</td>
<td>Management, sociology, social psychology, anthropology</td>
<td>Study of how organisational members make sense of information systems &amp; thereby assimilate them</td>
<td>What meanings does information system X hold for members of organization Y? How to achieve accommodation between different views?</td>
<td>Socio-technical change that holds different meanings for different individuals and groups</td>
<td>Stakeholder whose ‘framing’ of the EPR is crucial to its assimilation. Agent whose creativity can be drawn upon in this effort</td>
<td>Scene &amp; setting for an unfolding story; webs of meaning in which organisational actors are suspended</td>
</tr>
<tr>
<td>Information systems (technological-in-practice)</td>
<td>Organizational sociology, social psychology, philosophy</td>
<td>Study of how social structures recursively shape &amp; are shaped by human agency, &amp; role of technology in this</td>
<td>What is the relationship between organisational actors, technology X, and the organisation – and how does this change over time?</td>
<td>Itinerary and organiser whose physical &amp; technical properties structure &amp; support collaborative clinical work</td>
<td>Knowledgeable creative agent for whom social structures both create possibilities &amp; limit the possible</td>
<td>Generated &amp; regenerated through interplay of action &amp; structure. Does not study ‘technologies’ &amp; ‘contexts’ separately but technologies-in-use</td>
</tr>
<tr>
<td>Computer supported cooperative work</td>
<td>Computer science, software engineering, psychology, sociology</td>
<td>Study of how groups of people work collaboratively, supported by information technology</td>
<td>How can technologies support the work of multiple interacting people?</td>
<td>Contextualized artefact</td>
<td>Agent who works to local goals in collaboration with others &amp; creatively overcomes limitations of formal tools</td>
<td>External milieu or emergent property of action (constituted by &amp; inextricable from an activity involving people &amp; technologies)</td>
</tr>
<tr>
<td>Research tradition</td>
<td>Disciplinary roots</td>
<td>Definition &amp; scope</td>
<td>General format of research question</td>
<td>EPR conceptualised as...</td>
<td>EPR user conceptualised as...</td>
<td>Context conceptualised as...</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------</td>
<td>--------------------</td>
<td>------------------------------------</td>
<td>--------------------------</td>
<td>-------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Critical sociology</td>
<td>Sociology, philosophy</td>
<td>Study of relationship between people &amp; social order, &amp; role of technologies in this</td>
<td>What social structures &amp; power imbalances are embedded in technology X, &amp; what impact does this have on social roles/relationships?</td>
<td>Implicated in micro &amp; macro power dynamics (because of link between knowledge &amp; power)</td>
<td>Constrained by dominant social Structures, which may be built into technologies by designers</td>
<td>Social &amp; material conditions into which the unequal social order is inscribed; more or less stable structure of macro social relations</td>
</tr>
<tr>
<td>Empirical philosophy (actor network case studies)</td>
<td>Philosophy, sociology, linguistics</td>
<td>Study of sociotechnical networks: considers how relationships &amp; power shift within network</td>
<td>How has network, with its various relationships, work practices &amp; risks, changed as a result of technology X?</td>
<td>Actor in a network</td>
<td>Actor in a network</td>
<td>EPR &amp; its context together form the network; the one cannot be studied without the other</td>
</tr>
<tr>
<td>Systems approaches</td>
<td>Systems &amp; management research, drawing on cognitive psychology, CSCW &amp; ANT</td>
<td>Systems perspective</td>
<td>What role does the EPR play within a complex healthcare system?</td>
<td>Component of complex socio-technical system whose features &amp; properties may come together in unpredictable ways</td>
<td>Component of complex socio-technical system whose features &amp; properties may come together in unpredictable ways</td>
<td>Complex, changing environment</td>
</tr>
</tbody>
</table>
Interrelationships or silos?

Silos

- Most health informatics literature ignores socio-technical perspectives
- Technology structuration (Orlikowski) largely US organisational sociologists and doesn’t cite/is mostly not cited by European critical sociologists

Not silos

- Biomedicine meets socio-technical approaches
  - Cross-disciplinary appeals (Pratt et al.)
  - ‘Multilingual’ researchers (e.g. Berg)
- Socio-technical approaches aligning
  - CSCW and STS have common roots in ANT, Zuboff etc.
  - Links between CSCW and STS over the years (e.g. Suchman)
  - Coming together of CSCW, STS and IS with newer researchers (e.g. Ellingsen)
  - Østerlund draws on Orlikowski and Berg + brings in social psychology
  - Technology structuration meets ANT with “narrative networks” (Pentland & Feldman)

Berg (1999), *Comp Supp Coop Work*, 8: 373-401
Østerlund (2004), *J Center Inf Studies*, 5: 35-43
What does it mean?

- Common roots (like ANT) perhaps made it easy for CSCW and STS to come together
- A result of the greater accessibility of academic writing through the Internet?
- Repeated overtures from more socio-technical researchers to biomedical informatics up against an optimistic political rhetoric and a naïve, simplistic and fallacious view of EBM
Thomas Kuhn
“The Structure of Scientific Revolutions” (1962)
Thomas Kuhn
“The Structure of Scientific Revolutions” (1962)

A discipline sees a repeated cycle of ‘crises’, leading to ‘paradigm shifts’, out of which emerges ‘normal science’.
Rise and fall of diffusion research in rural sociology
Rise and fall of diffusion research in health related fields
Greenhalgh, Robert *et al.*

Different disciplines separately develop a paradigm and conduct ‘normal science’.
Greenhalgh, Potts et al.
Reflections

• The piles are probably subjective, an interpretive tool
  – Just like normal systematic reviews (ergo sensitivity analysis?)

• Tools for determining piles? Social network analysis

• Synthesis complicated

• Very different picture to traditional Cochrane approach

• Rich array of theories and methods

• Systematic, but interpretive
References
