

# Two Approaches to EBHP -> Two Sets of Almost Insoluble Problems

Nancy Cartwright
Durham Univ. & Univ. of California at San Diego
Kent workshop, May 2017

Two approaches to policy

#### Intervention-centred

- Focuses on intervention-outcome pairs
- As in 'What Works' initiatives
  - 7 UK What Works Centres
    - Including NICE!!!
  - US Dept of Education's What Works Clearing House
  - J-PAL
  - Lots of work at DFID

• • •

## Context-c

- geographic, and cultu afford causal pathway outcome
- 'Systems' approach
- As in
  - Eileen Munro: "Child p problem.'
  - Nature Conservancy

• Focuses on the under conservation action planning handbook



#### Intervention-centered approach

- *Focuses*: on characteristics of the policy
  - Does it work?
  - For whom, when, where?
  - How to implement it
  - How much does it cost?
  - What are the side effects?
- Studies:
  - Repeatable causal processes
- Requires: evidence to support generalizations or transfers of policy outcomes

#### Context-centered approach

- Focuses: on the arrangements in the target context
- Studies: what causal processes these afford; what changes can be made so that they afford more desirable processes
- Requires:
  - A model of what's happening in the target context
  - An understanding of how the powers and arrangements afford this
  - A plan to change what's happening, via producing either
    - A new intervention, old structure
    - New structure
  - Evidence for all of this

## Intervention centring

'Quick Guide'...Learning From Research: Systematic Reviews For Informing Policy Decisions

Each concept within the question has to be carefully defined, as this will affect which studies are included or excluded...Thus a review on the effects of homework on children would require clarity of what was meant by both 'children' and 'homework', and also what 'effects' were to be considered.

### Introductions to systematic reviews...

- One study reviewed research evidence relating to accidental injury and risk-taking behaviour by young people aged 12-24.
- What does the evidence tell us about the effectiveness and efficiency of committee work?
- Single-sex settings seem to be effective in reducing stereotypical gender constructions when the aim is ...

#### 3.15.1 Captive breeding

Based on the collated evidence, what is the current assessment of the effectiveness of interventions for captive breeding?

Likely to be beneficial	<ul> <li>Artificially incubate and hand-rear birds in captivity: raptors</li> <li>Artificially incubate and hand-rear birds in captivity: seabirds</li> <li>Artificially incubate and hand-rear birds in captivity: songbirds</li> <li>Artificially incubate and hand-rear birds in captivity: waders</li> <li>Use captive breeding to increase or maintain populations: raptors</li> </ul>
Unknown effectiveness (limited evidence)	<ul> <li>Artificially incubate and hand-rear birds in captivity: bustards</li> <li>Artificially incubate and hand-rear birds in captivity: cranes</li> <li>Artificially incubate and hand-rear birds in captivity: gamebirds</li> <li>Artificially incubate and hand-rear birds in captivity: parrots</li> </ul>

Unknown effectiveness (limited evidence)   Based on: 4 studies	
<ul> <li>Use captive breeding to increase or maintain populations of raptors</li> <li>Likely to be beneficial   Based on: 5 studies</li> </ul>	,
<ul> <li>Use captive breeding to increase or maintain populations of bustards</li> <li>Unknown effectiveness (limited evidence)   Based on: 4 studies</li> </ul>	,
Use artificial insemination in captive breeding Unknown effectiveness (limited evidence)   Based on: 5 studies	,
<ul> <li>Use captive breeding to increase or maintain populations of pigeons</li> <li>Unknown effectiveness (limited evidence)   Based on: 1 study</li> </ul>	,
<ul> <li>Use captive breeding to increase or maintain populations of songbirds</li> <li>Unknown effectiveness (limited evidence)   Based on: 3 studies</li> </ul>	,
Artificially incubate and hand-rear bustards in captivity  Unknown effectiveness (limited evidence)   Based on: 2 studies	\

### Philosophically speaking

The intervention-centred approach makes most sense when

- The intervention has an inbuilt 'tendency' towards that outcome
  - As with gravity wrt making heavy bodies fall
- Do the bulk of public health interventions have an inbuilt tendency to the their targeted outcomes?

Killing ticks will reduce spread of lime disease??

Compare:
Killing
badgers will
reduce the
spread of
bovine TB.

#### The trouble with culling badgers



Badger culling has been tried many times over the last 30 years but studies have failed to prove its ability to reduce levels of bTB.

The best designed and largest cull was the Randomised Badger Culling Trial carried out by the Independent Scientific Group set up to advise the Secretary of State for Environment, Food and Rural Affairs on how best to tackle the problem of cattle TB. Its final report in 2007 showed that small-scale culling, targeted at particular farms, increased the incidence of the disease in herds rather than reduced it.

Widespread culling, over areas of 100km², achieved a modest overall reduction in cattle TB, but increased incidence on adjoining lands which were not culled. The reason was that culling caused badgers to move around more widely, transmitting more infection on ea nother and to cattle <sup>1,2,3</sup>.

This change in badgers' behaviour (known as the perturbation effect, see diagrams opposite) is likely to undermine the benefits of any form of culling.

#### wildlifetrusts.org

 Pope LC, et al (2007) Molecular Ecology 18: 4919-4929. 2. Canter SP, et al (2007) Proceedings of Biologics Science 247: 2769-2777. 3. Woodsroffs R, et al (2009) Proc. National Academy of Science 102: 14713-14717 In a stable badger population, there is limited movement of badgers from one area to another. Badger setts harbouring high levels of bovine TB infection tend to remain relatively separate

2 IMMEDIATELY POST-CULL

Once most badgers are removed from the cull area, a new territory opens up allowing badgers to come in from the surrounding areas



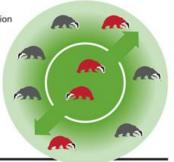
BADGER MOVEMENTS INCREASE

infection

Badger movements around and beyond the infected area increase. Immigrant badgers pick up the infection from abandoned setts and unculled infected animals. Badger-to-badger transmission increases along with the likelihood of badger-to-cattle transmission

4 NEW EQUILIBRIUM

Because the population is still lower than the carrying capacity of the total area, badgers move around much more than they did before the cull. The movement distributes the original infection over a wider area



Maybe: Killing badgers reduces the immediate number of badgers??

#### Giving deworming pills to children

- No inbuilt tendency toward improving reading scores
- This outcome depends on a complex underlying social system that allows – or not – the sequences of changes supposed to lead to better reading scores
- Maybe deworming medicine has a tendency to kill intestinal worms in children
- Even that depends on more underlying structures
  - Mebendazole works by inhibiting worms' ability to absorb sugars, by interfering with the proteins in their intestine or absorptive cells
- Happily we can take as given the structural similarity among threadworms
- Then all we have to worry about is
- Everything else!

### Context-centring

Social systems are like mechanisms: they afford causal processes



#### Context centring

US National Academy of Sciences' To Err Is Human: Building a Safer Health System "The title of this report encapsulates its purpose. Human beings, in all lines of work, make errors. Errors can be prevented by designing systems that make it hard for people to do the wrong thing and easy for people to do the right thing. Cars are designed so that drivers cannot start them while in reverse because that prevents accidents. Work schedules for pilots are designed so they don't fly too many consecutive hours without rest because alertness and performance are compromised."

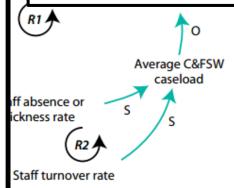
#### Causal pathways & causal structures

The Munro Review of Child Protection: **Final Report** A child-centred system Professor Eileen Munro Knowledgeable⊠

ic impact of efforts to improve social work tice

d Lane, London School of Economics and

Description of the underlying system that makes these likely



#### New child protection structures



Signs of Safety is an integrated framework for how to do child intervention work - the principles for practice; the disciplines for practitioners' application of the approach; a range of tools for assessment and planning, decision making and engaging children and families; and processes through which the work is undertaken with families and children, and including partner agencies.



### Context-centring: problems

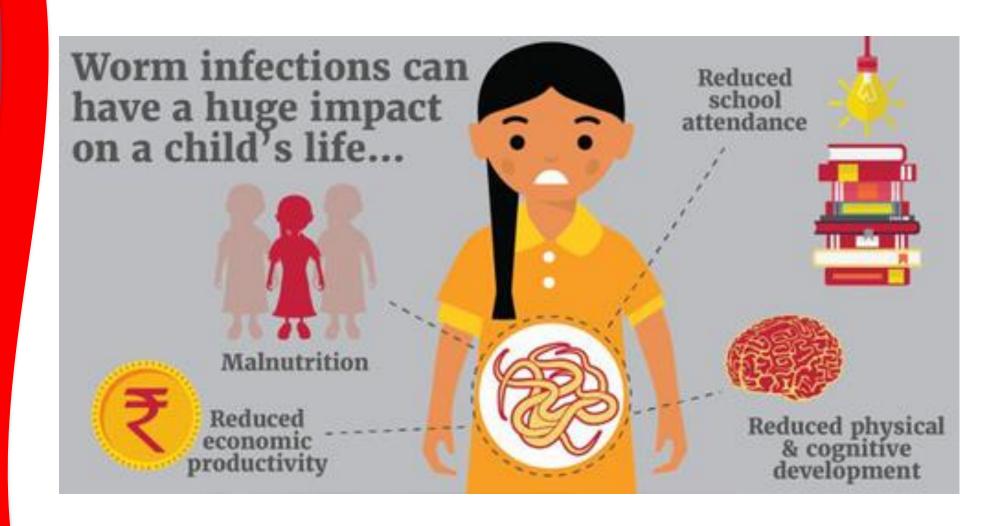
- Too hard
- Too expensive
- Too arbitrary

Intervention centring: problems

### 1. The problem of the long view

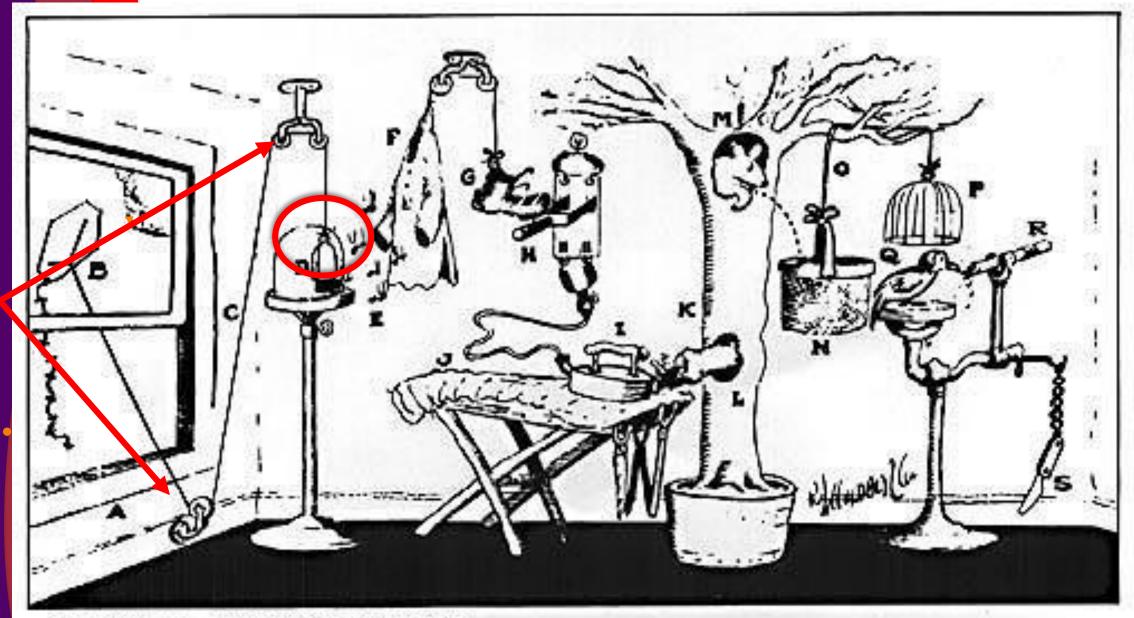






1. The problem of the long view

2. The Donald-Davidson problem

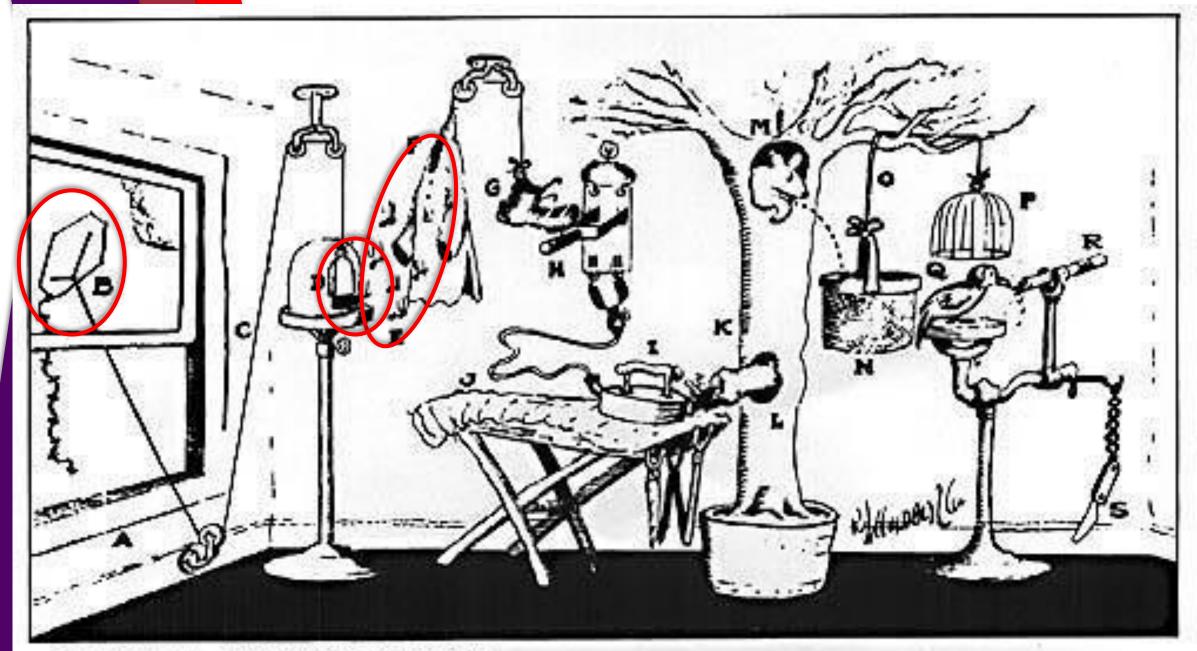


Pencil Sharpener RUBE GOLDBERG (tm) RGI 038

1. The problem of the long view

2. The Donald-Davidson problem

3. The concatenation problem



Pencil Sharpener RUBE GOLDBERG (tm) RGI 038

- U  $\rightarrow$  R,
- $\bullet$  B  $\rightarrow$  E

$$U \Rightarrow E$$

- U = k,  $U \rightarrow R$ , R = d,
- B = d,  $B \rightarrow E$ , E = m

Therefore:  $k \rightarrow d \rightarrow m$ 

Where can an intervention contribute in the same way as in a study population?

Where the underlying structures that allow the intervention/outcome connection are sufficiently like those in the study population



Voodoo: when the interventioncentered approach works

#### Michael Strevens: Voodoo that works



- Ceteris paribus, in conditions Z, Fs cause Gs = By way of the target mechanism M, the conditions Z and the property F bring about the property G
- When a causal hypothesis is framed it is supposed to make a claim about a particular contextually determined mechanism: the target mechanism
- The facts about M that make the cp causal claim true "are typically opaque to the scientists who formulate and test them."





- The reference to mechanisms is opaque but we can still put our cp claims to use
- Successes depend on
  - Markers
  - Cautions

### System markers

Manufactured items come with labels, logos





• God-made structures are often recognisable 'from the outside'

What about social systems?

### Common development markers

- Democracy?
- Good governance?
- Growth/ GDP?
- Women's participation?
- Foreign direct investment?

• . . .

### Will deworming work here?



### Cautions

Don't plant red acorns till the spring





- Hard to come by
  - Hard to justify

#### Markers are fine

- IF they work, and IF there's good evidence that they do But
- 1. What does that evidence look like?
- 2. Where does it come from?

We don't have methods for answering

#### Warning: the 2 approaches

#### Context-centred

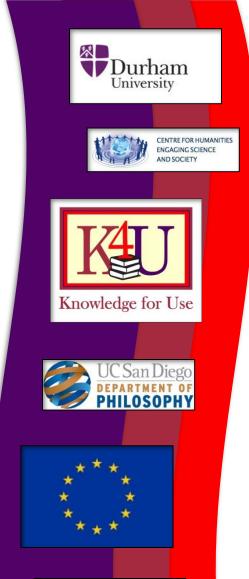
- Takes the problem on directly
- It's exceeding difficult
- It's expensive
- We have no guidelines for how to do this nor for how to evaluate what's been done

#### Intervention-centred

- Finesses the problem by looking for markers
- We have no guidelines for how to do this nor for how to evaluate what's been done

#### Conclusion

- No matter which approach you take....
- Hedge your bets and plan for failure



erc

from anywhere in the world

### Thank you

The K4U project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No 667526 K4U) The above content reflects only the author's view and that the ERC is not responsible for any use that may be made of the information it contains