

Bias and evidence hierarchies in the evaluation of smarter choices

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Motivations for this Review

1. Controversy around the robustness of smarter choices (or 'VTBC') evaluations
2. Growing influence of evidence hierarchies favouring experimental methods
3. DfT decision to downplay smarter choices in WebTag



The screenshot shows the homepage of the 'Local Transport Today' website. The top navigation bar includes links for Home, Magazines, Reports, Events, Consultants, Subscription, and Shop. Below this, there is a 'Follow TransportXtra' button with a Twitter icon. The main content area features a 'Lead Story' for 'Issue 598 11 Jun 2012' titled "'Smarter choices' advocates prepare rival modelling guidance'. The article includes a photo of a man, Joseph, and text stating that advocates of 'smarter choice' travel behaviour change policies are preparing their own guidance on modelling the impact of the measures because they say the DfT's advice is too negative. The article also mentions that the DfT's Modelling smarter choices guidance was published last month and sets out how the Department expects transport modellers to assess the impact of measures such as travel plans, car clubs and car sharing schemes. But critics say its tone is too downbeat.

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Lead Story: Issue 598 11 Jun 2012

'Smarter choices' advocates prepare rival modelling guidance

Advocates of 'smarter choice' travel behaviour change policies are preparing their own guidance on modelling the impact of the measures because they say the DfT's advice is too negative.

The DfT's Modelling smarter choices guidance was published last month and sets out how the Department expects transport modellers to assess the impact of measures such as travel plans, car clubs and car sharing schemes. But critics say its tone is too downbeat.

Joseph: alternative guidance "not a declaration of war" on DfT

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Sustrans consults on cycle design guidance

European Court rules UK must clean up illegal traffic

Aims

1. To examine claims of invalidity or bias in evaluations of smarter choices
2. To examine the case for evidence hierarchies (Do RCTs offer a solution to 'low quality' transport research?)
3. To consider implications of applying evidence hierarchies to transport research generally

Controversy: Alamein Travelsmart Evaluation

Morton & Mees (2010)

Alleged sources of bias in the evaluation:

- Expectation bias
- Good subject effect
- Non-response bias

Special edition of Transport Policy 16(6) on evaluation of smarter travel (Chatterjee 2009)



Tony Morton



Paul Mees



Ian Ker (2011)

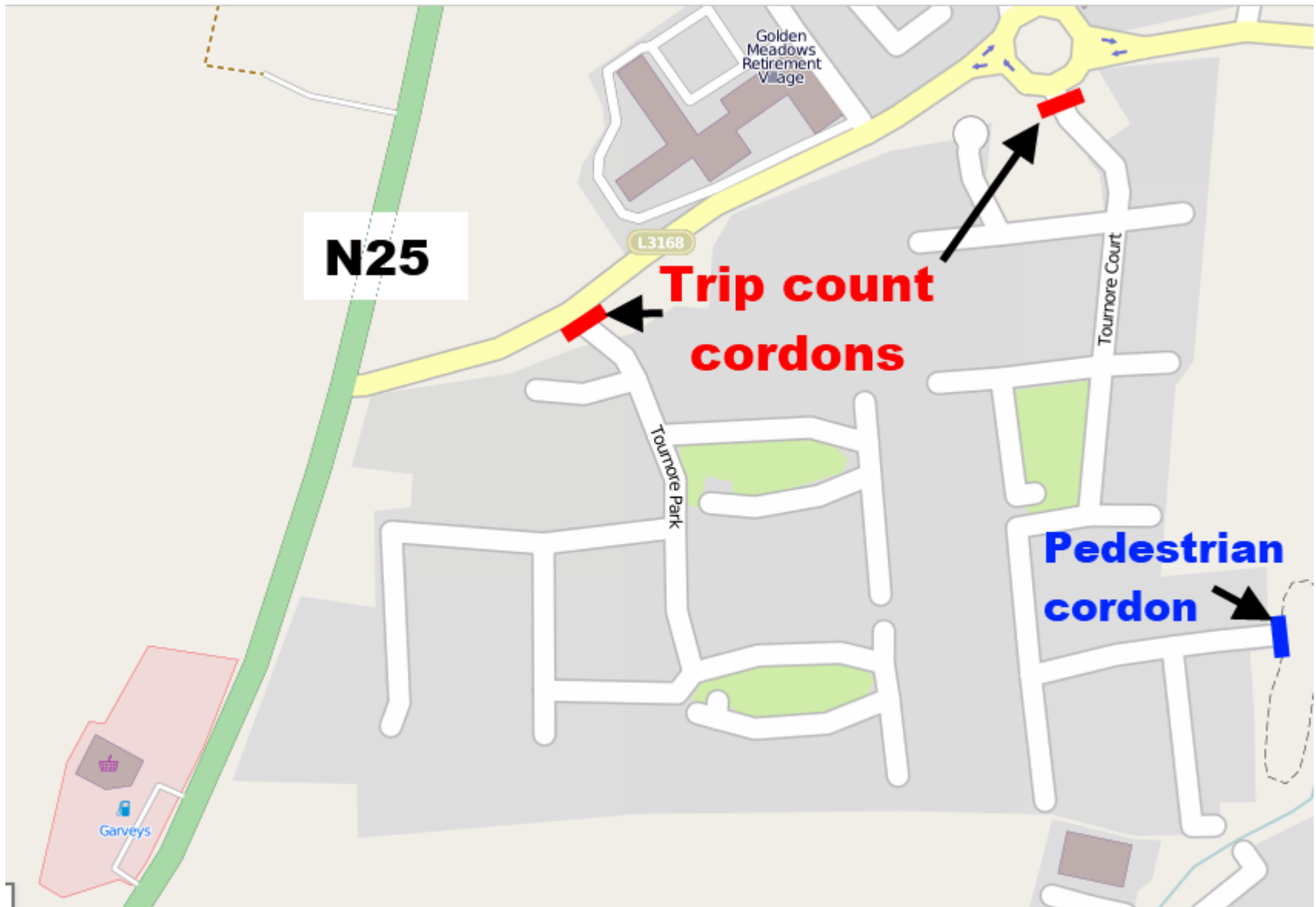
The Challenge of Triangulation

	Household surveys ##		Traffic counts	Possible explanations for trends
	Trips per person	Distance per person	Overall change	
National trend	-1.2%	-0.9%	-0.5% (car traffic) -0.7% (all vehicles)	
Sustainable Travel Towns	-9%	-5%~-7%		
Darlington	-7%~-10%	-6%~-7%	-2.4% to -3.2% (all vehicles)	Employment growth of 10% during the STT period (often in peripheral business parks) may have led to inward commuting by non-residents, masking reductions in residents' car travel
Peterborough	-8%~-10%	-7%~-10%	-2.4%	Population grew by >6% during STT period, so city-wide fall in car traffic of 2.4% equivalent to <i>per capita</i> reduction of ~8%
Worcester	-8%~-10%	-3%	Growth until 2006/07, then fall; -1.9% to -2.6%	Only one non-peripheral counter, meaning that the 'overall' change may be an underestimate of actual reductions.

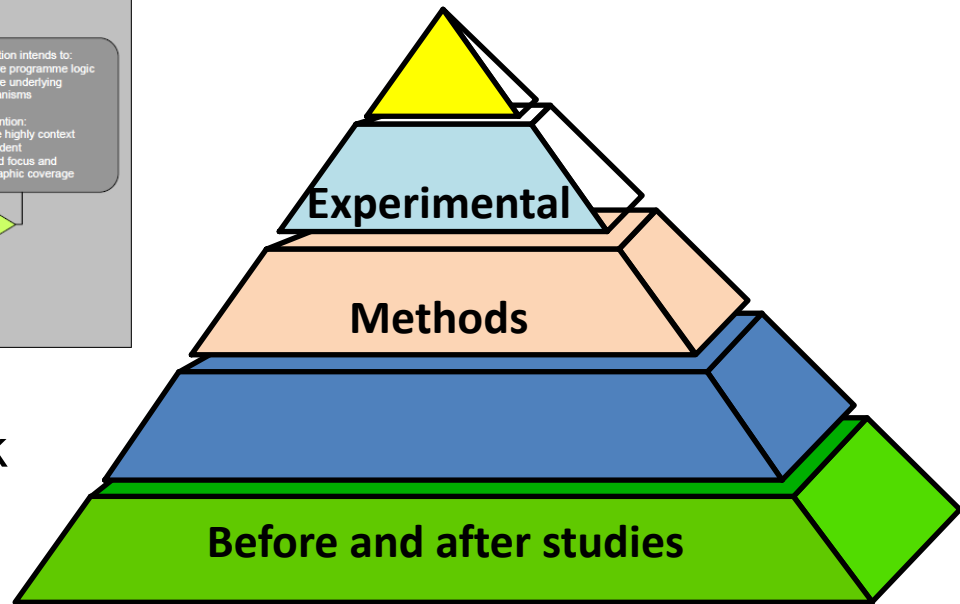
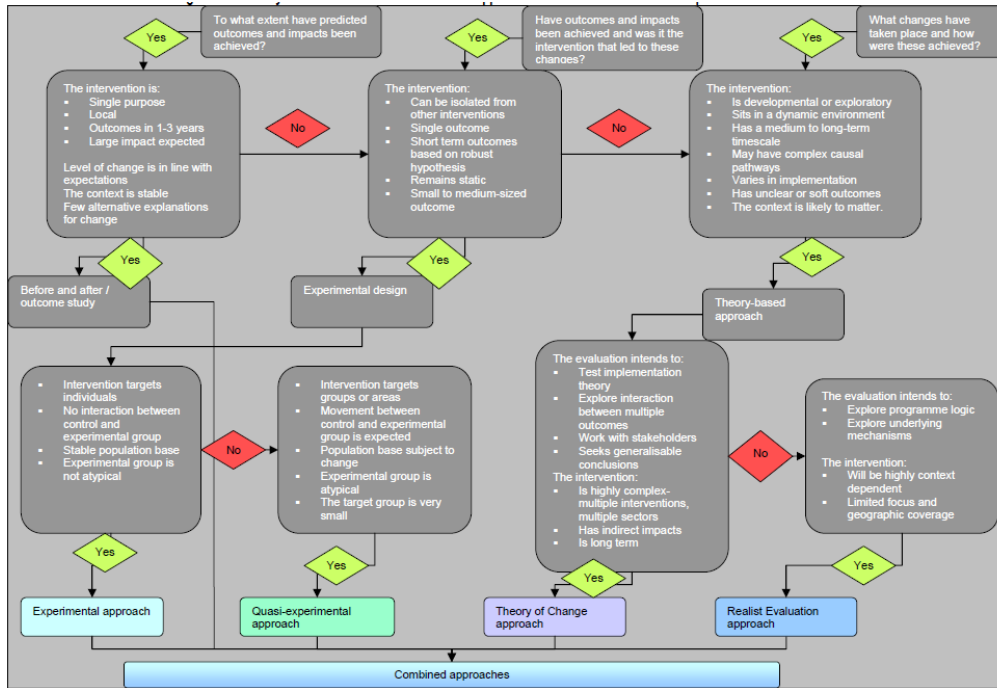
Sustainable Travel Demonstration Towns, from Sloman et al (2010)
(two intermediate columns removed)

Triangulation on a 'Like for Like' Basis

Dungarvan (Irish Sustainable Travel Town) – see Melia (2013)



Approaches to Research Design



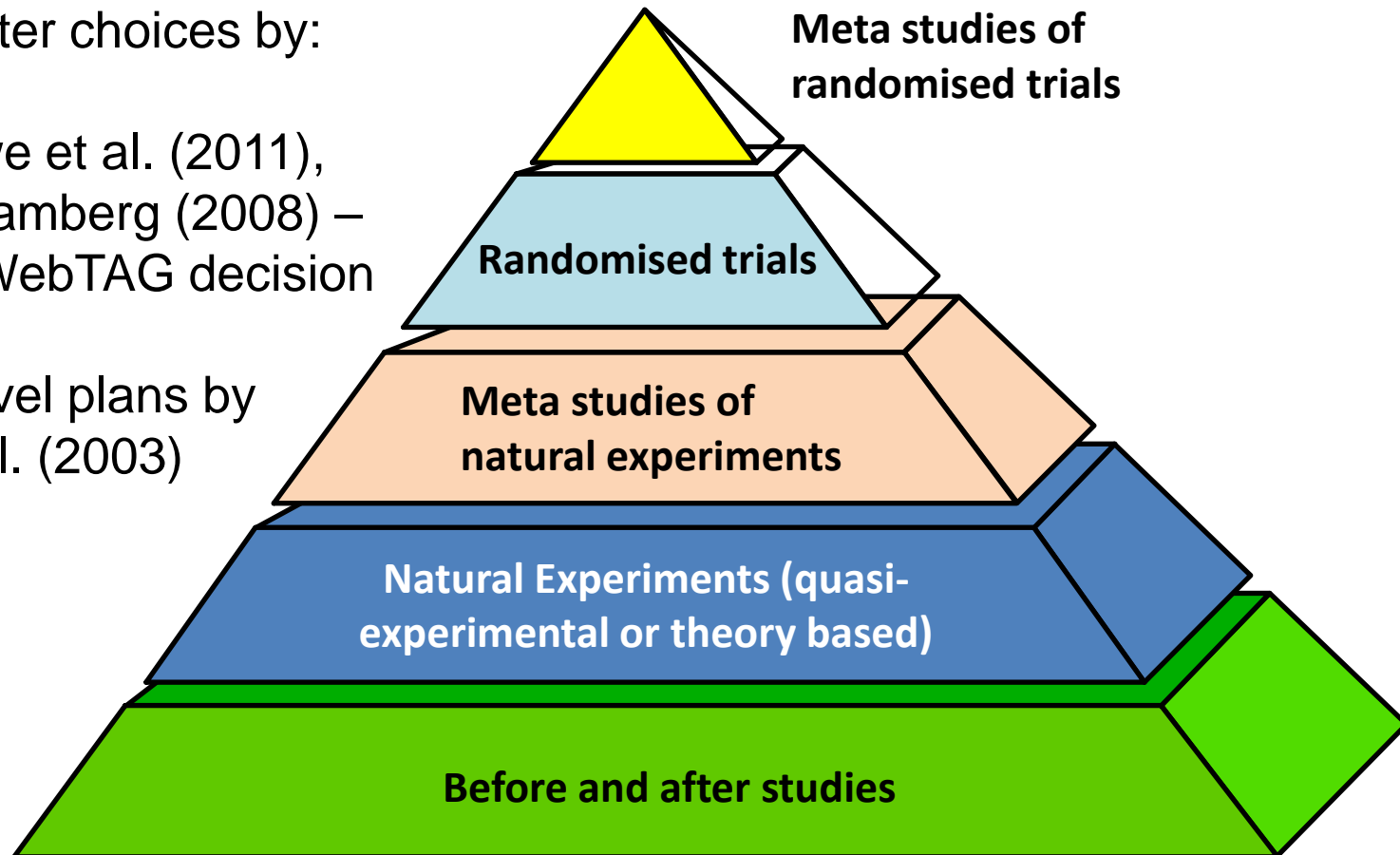
1. 'Horses for courses' e.g. Tavistock Institute & AECOM (2010)

2. Hierarchical

Hierarchies of Evidence?

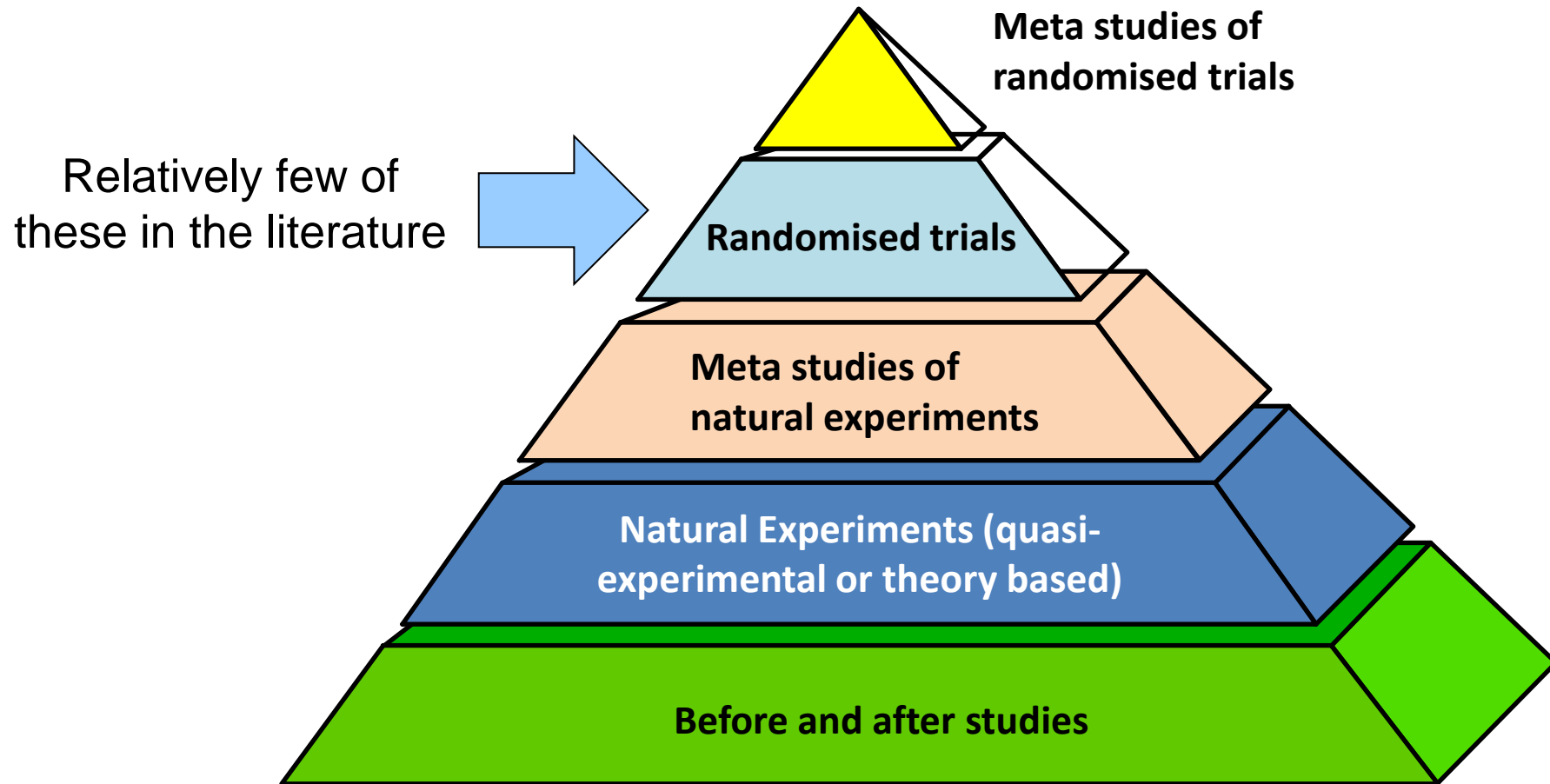
Applied to smarter choices by:

- Graham-Rowe et al. (2011),
- Möser and Bamberg (2008) – cited in DfT WebTAG decision
- To school travel plans by Rowland et al. (2003)



From Leigh (2009)

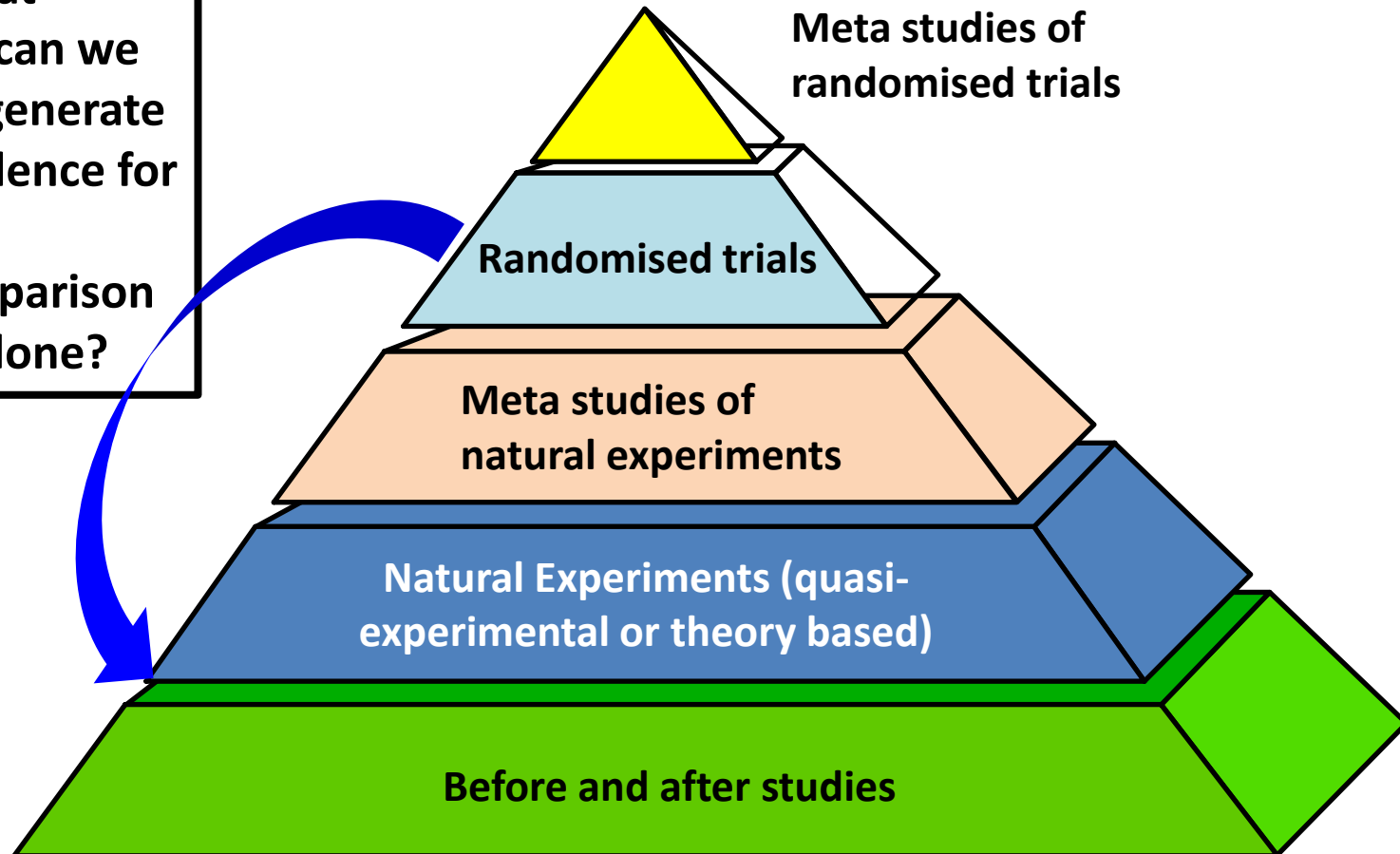
Hierarchies of Evidence?



From Leigh (2009)

Hierarchies of Evidence?

Under what circumstances can we state that RCTs generate more robust evidence for policy – based on a comparison of methods alone?



From Leigh (2009)

If All Are *Fully* Satisfied

1. The main focus of the research is to test (but not explain) a hypothesised cause-effect relationship.
2. A representative study population of a sufficient size can be obtained from the target population to whom the intervention would be applied.
3. The intervention can be applied selectively to an experimental group within the study population.
4. No other factors with a significant influence on the outcome would impact the experimental and control groups differently during the experiment.
5. Wider application of the intervention would replicate the causal relationships which applied during the experiment.

**experimental methods will
yield more robust results**

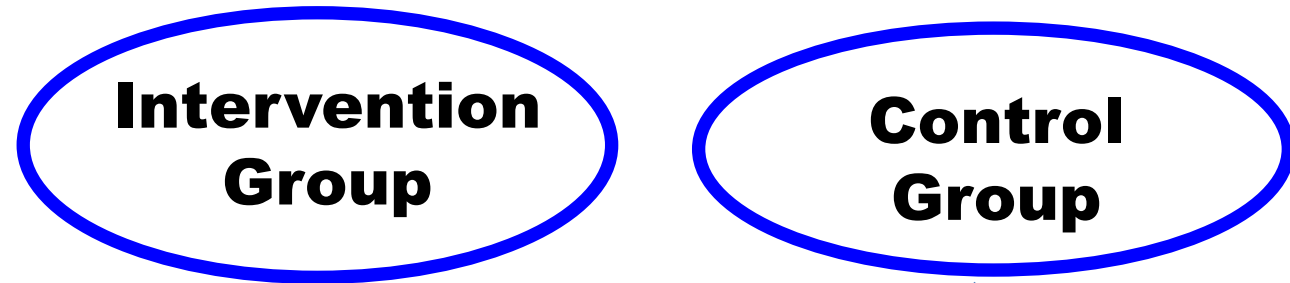
If Criteria Are *Partially* Satisfied

1. The main focus of the research is to test (but not explain) a hypothesised cause-effect relationship.
2. A representative study population of a sufficient size can be obtained from the target population to whom the intervention would be applied.
3. The intervention can be applied selectively to an experimental group within the study population.
4. No other factors with a significant influence on the outcome would impact the experimental and control groups differently during the experiment.
5. Wider application of the intervention would replicate the causal relationships which applied during the experiment.

Comparison becomes an empirical question

Key Issues: Scale & Social Interaction

During the experiment:



* Interactions must either be identical – or else have no impact on outcomes

How significant are these influences?

Implementation:

Target Population

Example – Role of Cycling Infrastructure in Modal Choice



Sustrans Connect2

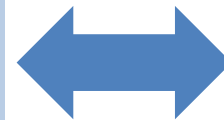
Sustrans' Connect2 project has transformed everyday travel in communities across the UK, creating new bridges and crossings to overcome busy roads, rivers and railways, and linking these to networks of walking and cycling routes, making it easier for millions of people to walk and cycle for everyday journeys.

Quasi-experimental evidence: no significant modal shift e.g. Brand et al. (2014)



Historical/descriptive evidence.

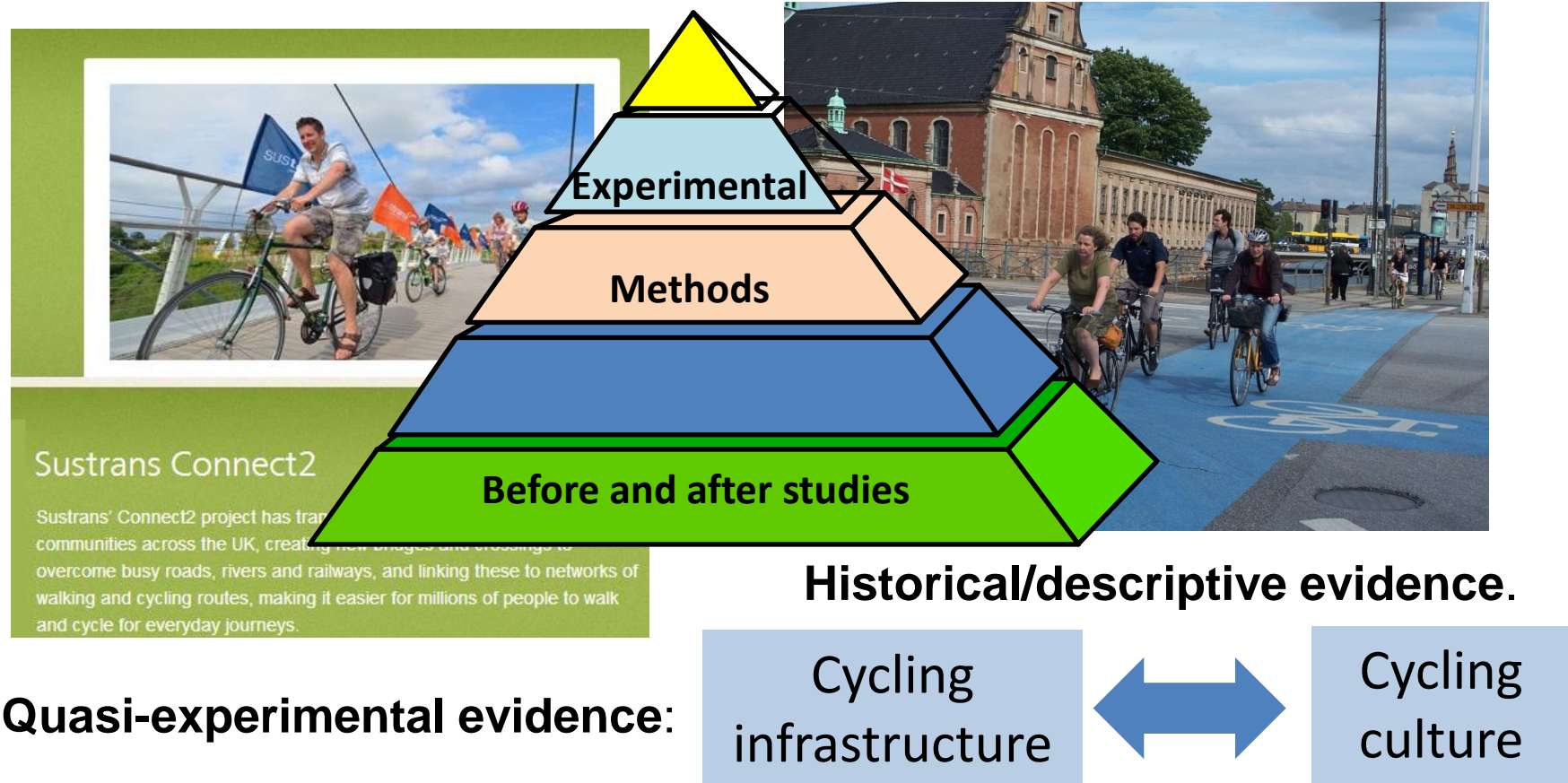
Cycling
infrastructure



Cycling
culture

Symbiotic relationship e.g. Pucher et al. (2010), Melia (2015)

Which Types of Question Do We Ask?



“Choice of Question Bias” Jadad and Enkin. (2007)

Conclusions

1. There are reasons for some concern about potential bias in the evaluation of smarter choices (or any other transport intervention involving human behaviour)
2. There are no easy answers, but self-contained areas may offer one means of strengthening triangulation
3. Experimental methods are only suited to a relatively narrow range of transport questions
4. Hierarchies of evidence risk choice of question bias, misapplication of experimental methods and misleading findings for policymakers
5. Researchers need to do more to educate policymakers about the limitations of experimental methods and of quantification and certainty in findings.

References

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