GENERAL ELIMINATION METHODOLOGY

OVERVIEW

General Elimination Methodology (GEM) is a theory-driven qualitative evaluation method that improves our understanding of cause and effect relationships by systematically identifying and then ruling out causal explanations for an outcome of interest (Scriven 2008; White & Phillips 2012). Often used as a post-hoc evaluation method, it supports a better understanding of complexity.

Scriven, often cited as the originator of GEM, refers to it as 'inference to the best explanation' (Cook et al. 2010, p. 109). By this he means that '

> *We claim that the intervention has causes that are visible, and we do that by eliminating other possible causes in relatively systematic ways, a complicated but perfectly feasible process.*
>
> **(Cook et al. 2010, p. 109)**

Also called Modus Operandi Approach, GEM is compared to detective work, where a list of suspects are being ruled out based on presence and absence of motive, means, and opportunity. As such it describes an approach to thinking about causation that we all use, subconsciously, on a regular basis.

Scriven (2008) proposed the GEM in a broader paper that discusses the limitations of Randomised Controlled Trials (RCTs) and the concept of causal inference in the social sciences. His broader argument is that RCTs do not have a monopoly on making causal claims in the social sciences and are a specific tool for addressing causal inference in a narrow set of circumstances, whereas the GEM lies in the skills of every expert practice and 'is the underlying logic of RCTs and all quasi-experimental approaches as well' (Scriven 2008: 21). In this sense Scriven (2008) argues that the GEM is the basis for all causal claims. However, despite its ubiquity, there is a relatively small literature on this approach.

The General Elimination Methodology has some similarities with process tracing, which could be seen as a more complex version of GEM. As such GEM could be useful introduction to some of the more complex small n methodologies.

KEY ELEMENTS OF METHODOLOGY

GEM involves three primary steps (Scriven 2008, White & Phillips 2012).

Step 1 Establish a 'List of Possible Causes'

First, the evaluators identify all the possible causes for the impact of interest. Scriven (2008: 21) states that a List of Possible Causes

> *usually refers to causes at a certain temporal or spatial remove from the effect, and at a certain level of conceptualization, and will vary depending on these parameters; of course, the context of the investigation determines the appropriate distance parameters.*

Second, they identify the necessary conditions for each possible cause and assess whether the conditions for each possible cause are present. This work can be based on secondary data analysis such as review of reports, articles, websites and other sources generally used to build a theory of change.

The evaluators then need to identify rival explanations for the outcome of interest. This is generally done by engaging stakeholders in interviews or workshops.

Step 2 List the modus operandi for each cause

A modus operandi (MO) is a sequence of events or set of conditions that need to occur / be present for the cause to be effective. In investigative terms, detectives (i.e. evaluators) set a list of means, motives, and opportunity which are considered against each suspect (i.e. cause). Scriven (2008: 21) states that:

> *Each cause has a set of footprints, a short one if it's a proximate cause, a long one if it's a remote cause, but in general the MO is a sequence of intermediate or concurrent events or a set of conditions, or a chain of events, that has to be present when the cause is effective.*

The list of modus operandi helps evaluators decide whether certain conditions should be included or rejected.

Step 3 Assess each case against the evidence available

For each possible cause, the evaluator will consider the presence or absence of the factors identified in the modus operandi, and only keep those whose modus operandi are completely present.

As White and Philip (2012) discuss, the logic here is two-fold. Identifying elements of a Modus Operandi which are present provides evidence that a Possible Cause might have been an actual cause, whereas identifying elements of a Modus Operandi which are not present allows any Possible Cause that does not fit the evidence to be eliminated, leaving only those that do have a causal link. This reduces the number of potential causes and, ideally, there are very few causal pathways left. There are parallels here with the 'hoop tests' and 'smoking gun' tests of Process Tracing, which go further to formalise the logic of this approach.

RESOURCES REQUIRED

Skill set for evaluators

The GEM methodology is a form of case study analysis that uses predominantly qualitative methods such as interviews, observations, ethnography and document analysis.

Scale of the undertaking

Scriven (2008) emphasises that much work presented as a 'case study' is of a poor quality:

> *In the past a great deal of hopelessly unscientific work has been put forward as 'qualitative methodology,' including many anecdotal reports described as case studies*
>
> **(Scriven 2008, p. 19)**

It is important therefore that case studies are undertaken in depth and to a high standard implying significant resources will be required.

CASE STUDY

There are relatively few published examples of the use of General Elimination Theory. Most of these come from the conservation field.

Salazar et al. (2019) evaluated the impact of a social marketing in the conservation sector using General Elimination Methodology. They wanted to assess the long-term impacts of a 1998 Rare Pride campaign on the island of Bonaire that was designed to increase the population of the Lora (Amazona barbadensis), a threatened parrot. Salazar et al. interviewed stakeholder groups to determine their perceptions of the drivers of the changes in the Lora population over time. They used these data to develop an overall theory of change to explain changes in the Lora population by looking at the overlap in hypotheses within and between stakeholder groups. They then triangulated that theory of change with evidence from government reports, peer-reviewed literature, and newspapers. The increase in the Lora population was largely attributed to a decrease in illegal poaching of Loras and an associated decrease in local demand for pet Loras. They concluded that decreases in poaching and demand were likely driven by a combination of law enforcement, social marketing (including the Rare campaign), and environmental education in schools. GEM helped them show how multiple interventions influenced a conservation outcome over time.

Reference

Salazar, B., Mills, M. and Verissimo, D. (2019) 'Qualitative impact evaluation of a social marketing campaign for conservation', *Conservation Biology*, Vol 33(3) pp.364-644

RESOURCES

Key reading

There is very little published material on General Elimination Methodology. The key paper in which GEM was first described in the terms set out here was

Scriven, M. (2008) 'A Summative Evaluation of RCT Methodology: & An Alternative Approach to Causal Research'. *Journal of MultiDisciplinary Evaluation*, Vol.5(9) pp.11-24, jan. Available at: https://journals.sfu.ca/jmde/index.php/jmde_1/article/view/160

For an interesting discussion about causation between Scriven, the originator of GEM and Cook, a proponent of 'traditional' models of counterfactual impact evaluation see:

Cook TD, Scriven M, Coryn CLS, Evergreen SDH (201) 'Contemporary Thinking About Causation in Evaluation: A Dialogue With Tom Cook and Michael Scriven'. *American Journal of Evaluation*. 2010;31(1):105-117. doi:10.1177/1098214009354918

Further references

Cook TD, Scriven M, Coryn CLS, Evergreen SDH (201) 'Contemporary Thinking About Causation in Evaluation: A Dialogue With Tom Cook and Michael Scriven'. *American Journal of Evaluation*. 2010;31(1):105-117. doi:10.1177/1098214009354918

Scriven, M. (2008) 'A Summative Evaluation of RCT Methodology: & An Alternative Approach to Causal Research'. *Journal of MultiDisciplinary Evaluation*, Vol.5(9) pp.11-24, jan. Available at: https://journals.sfu.ca/jmde/index.php/jmde_1/article/view/160

White H and Phillips D (2012) Addressing Attribution of Cause and Effect in Small n Impact Evaluations: Towards an Integrated Framework, Working Paper 15, International Initiative for Impact Evaluation.