PROCESS TRACING

Process tracing is a qualitative analysis methodology. The main purpose of process tracing is to establish whether, and how, a potential cause or causes influenced a specified change or set of changes. This is done by applying formal tests to examine the strength of evidence linking potential causes to the changes. Process tracing also involves testing alternative ideas about how change might have come about.

Process tracing is a qualitative analysis methodology. It was originally used as a research methodology that attempted to provide theoretical explanations of historical events (Falleti 2006). Nowadays, it is increasingly being used within monitoring and evaluation (M&E).

The main purpose of process tracing (within M&E) is to attempt to establish whether, and how, a potential cause or causes influenced a specified change or set of changes. This is done by applying a set of formal tests to examine the strength of evidence linking the activities carried out within a project or programme to the change(s). A key feature of process tracing is the development and testing of alternative ideas about how and why change might have happened (George and Bennett 2005).

When used as an M&E methodology, process tracing is mainly used during evaluations and impact assessments. Applied properly, process tracing can show not only *whether* a change occurred, but *how* and *why* it occurred as well (Punton and Welle 2015). This enables organisations to demonstrate accountability for results through identifying their own particular contributions to change, and also supports improved performance based on learning about what works and why.

To-date, CSOs have tended to use process tracing in areas of work such as policy influencing and capacity development, where assessment of change is often contested, and change may be the result of many different influences. Process tracing is less likely to be used within straightforward service delivery programmes in sectors such as health or education, where contribution to change is often easier to assess using more traditional (and cheaper) tools and methods.

Key concepts in process training

In its pure form, process tracing is based around a set of formal tests. These are designed to assess causation. They are applied to all the different possible explanations for how a particular change might have come about in order to confirm some and/or eliminate others. Within process tracing these different explanations are known as ***hypotheses***. The formal tests are described in the table below (adapted from Bennett (2010) and Collier (2010), and explained on the following page).

		Sufficient to establish causation	
		No	**Yes**
Necessary to establish causation	**No**	***1. Straw in the Wind Test*** *Passing: Affirms relevance of hypothesis but does not confirm it* *Failing: Suggests hypothesis not relevant but does not eliminate it* *Implication for rival hypotheses: None*	***3. Smoking Gun Test*** *Passing: Confirms hypothesis* *Failing: Does not eliminate hypothesis* *Implication for rival hypotheses: None*
	Yes	***2. Hoop Test*** *Passing: Affirms relevance of hypothesis but does not confirm it* *Failing: Eliminates it* *Implication for rival hypotheses: None*	***4. Doubly Decisive Test*** *Passing: Confirms hypothesis* *Failing: Falls short in establishing necessity and/or sufficiency* *Implication for rival hypotheses: Eliminates all other hypothesis*

The tests are classified based on two criteria.

- The first is whether passing the test is ***necessary*** to establish a causal connection. For example, if it is agreed that a new government policy was decided at a particular conference then presence at that conference could be considered necessary. If a CSO was not present, then it could not have influenced the policy.
- The second is ***sufficiency***. Using the example above, just because a CSO was present at a conference does not mean it influenced the outcome. But if a government Minister publicly thanked the CSO for influencing a policy change this would be sufficient evidence to confirm that the CSO had had some influence over the change.

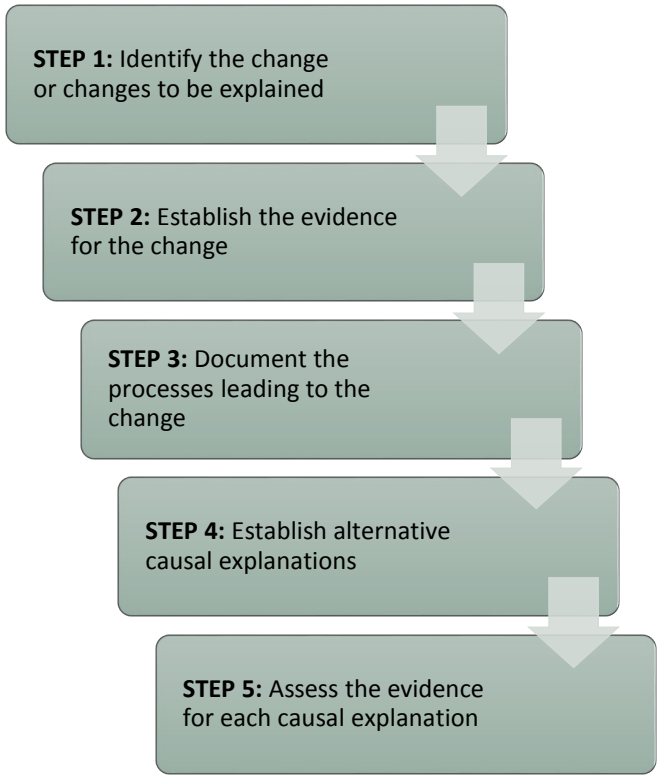
The tests themselves can be described as follows, (based on Collier 2010, pp5-7).

- A ***straw in the wind*** test, if passed, supports a particular hypothesis but does not rule it in or out. Passing straw in the wind tests is neither necessary nor sufficient for supporting or rejecting a hypothesis, and has no implications for any other hypotheses. For example, a straw in the wind test could involve establishing whether a CSO was part of an influential consortium that lobbied a government for a policy change. It is not a decisive piece of evidence, but might increase the plausibility of an argument that the CSO influenced the change. Straw in the wind tests are often regarded as the weakest of the four tests.
- A ***hoop*** test can be used to eliminate certain hypotheses. For example, if it has been established that a government body changed its mind about a policy during a conference, based on face-to-face discussions, then presence at that conference could constitute a hoop test. Presence on its own would not prove any influence over the change. But absence would undermine any argument that the CSO influenced the change.
- The ***smoking gun*** test can be used to confirm a hypothesis. For example, if a government Minister publicly acknowledges that a CSO had influence over a policy change then these are sufficient grounds for establishing some causality. Of course, this does not mean that other organisations or factors did not also influence the change. On the other hand, failure to pass a smoking gun test does not necessarily mean that a CSO did not influence the change in some way.
- Finally there is the ***doubly decisive*** test. This confirms one hypothesis and eliminates all others. An example might be a government Minister publicly stating that a CSO was solely responsible for bringing an issue to the government's attention and helping to change its mind. This kind of evidence is rare within development work.

These four tests are not designed to be rigidly applied, and some evidence may cut across different tests. Instead, the tests are supposed to be used as guidelines to help with the collection and analysis of evidence.

How it works

Process tracing does not include a defined series of steps, and can be applied in different ways in different circumstances. However, for the purposes of this paper process tracing has been divided into five steps. Note that these steps apply only to process tracing designed to test contribution to development outcomes, not to process tracing as a research methodology more widely.



STEP ONE

The first step is to **identify the change** (or changes) that are of interest. Sometimes the decision to conduct process tracing is made after a particular change or set of changes has been identified. In this case step one will not be necessary, as the change will already have been identified.

In other cases, organisations might look for change as part of the process. For example, evaluators might be asked to identify key changes resulting from a campaign or capacity development programme, and then apply process tracing to assess contribution. This might involve identifying the change or changes as a participatory exercise with project or programme staff. This is likely to involve some work to prioritise the changes, as it is difficult to do process tracing well with multiple changes.

STEP TWO

The next step is to **establish the evidence** which confirms that the change has happened, and to what degree. Sometimes this may be a simple task. For example, establishing whether a policy has changed may be a

matter of record. But sometimes a change claimed by project or programme staff may need to be examined further. If the change is an intangible one, such as the enhanced capacity of supported organisations or greater empowerment of communities, then a large amount of work may be needed to establish whether or how far the change has actually taken place.

Process tracing does not include any particular tools or methodologies for assessing whether or not a change has happened. Instead, the normal range of tools and methods of data collection and analysis can be applied, such as interviews, observation, case studies, surveys or other more complex methodologies.

After collecting and analysing the evidence a judgement needs to be made about whether or how far the stated change or changes have happened. Obviously, if the evidence does not support this then there is little point in proceeding to the next stage. This is because assessments of contribution to an unproven change are unlikely to be of much practical use.

Once it has been established that a change has taken place, the next step is to **document the processes** that may have led to that change. If a project or programme theory of change exists then it can be used to guide the process of documentation. If one does not exist then a theory of change may need to be constructed.

In either event, the documentation process is likely to involve developing a timeline or narrative, describing the different activities that have been carried out, the tangible outputs that were delivered, the resulting intermediate and eventual changes, and external events that may have affected the change (or changes), in the order in which they happened (White and Phillips 2012).

As well as documenting what was done (or what changed) at different levels, it is also important to explain how and why it is believed that intermediate changes at one level affected change at higher levels. In this way a hypothesis can be developed that clearly shows *how* a project or programme believes it may have contributed to the change(s).

The next step in the process is to **establish alternative causal explanations**. Alternative explanations could be derived from theory, or they could be based on discussions with different stakeholders, or a combination of the two. The alternative explanations provide a set of different hypotheses about how and why a change (or set of changes) came about. Ideally, these should be competing hypotheses (meaning one hypothesis excludes the others) although this is often not realistic in social development work.

For each alternative hypothesis it is then necessary to state the particular events, processes or factors that may have contributed to the change or changes, as with step 3 above.

At the end of this step there should be a number of different hypotheses for how a change came about, each with its own causal explanation.

The last step is to **assess the evidence for each hypothesis**. But before collecting evidence, it is important to specify and document what kinds of evidence could strengthen or weaken the case for each competing hypothesis. This means setting out what evidence would be expected if a hypothesis was true, and what would be expected if it was false (Oxfam 2011). The formal process tracing tests – straw in the wind, hoop, smoking gun and doubly decisive – provide the framework for establishing the evidence.

It is then necessary to collect the evidence in order to see how far it supports each hypothesis. Again, process tracing does not specify how to collect the evidence, and the normal tools and methodologies of data collection and analysis should be used. The evidence should enable an evaluator to systematically analyse each link in the chain of each hypothesis to assess whether or not it stands up to scrutiny (White and Phillips 2012).

At the end of the process, an evaluator should be able to assess the extent to which competing causes or hypotheses may or may not have contributed to a change or set of changes. They should also be able to state how and why the change or changes came about.

Usage within CSOs

Process tracing has not been used that widely by CSOs to-date, although several have begun to experiment with it. Oxfam GB has probably been the pioneer organisation (see case study on the following page). However, based on INTRAC's own experiences, few CSOs have actually applied the formal tests that lie at the heart of process tracing. Instead, CSOs have been more interested in the development and investigation of alternative hypotheses.

This is perhaps because the formal tests – as explained in academic literature – are often described as ways of adjudicating between competing explanations, as in a court case or murder mystery. Whereas the reality for social development work is that there are usually many different contributions to change, and the task of an evaluator is to assess the relative importance of these different contributions.

Strengths and weaknesses

Within social development, process tracing's main strength is that it encourages a rigorous and transparent approach to assessing contribution to change. In other words it enables an organisation to build a plausible argument that shows exactly how it contributed to a change (or set of changes) and to compare this with alternative explanations. It is therefore particularly useful for organisations working in areas where assessment of attribution is difficult. And

Case study: Oxfam GB in Ghana

As part of its system of effectiveness reviews, Oxfam GB carried out an evaluation in Ghana, using its own adaptation of process tracing. An identified change of Oxfam's programme in Ghana was that a National Health Insurance Scheme (NHIS) had been shown to be an ineffective vehicle to deliver free universal health care in Ghana.

According to Oxfam programme staff, as part of an Oxfam campaign a controversial report had been published stating that the number of people enrolled under the NHIS was incorrect and should be revised downwards. A few months later, the National Health Insurance Authority (NHIA) revised its approach, resulting in a decrease in official statistics on membership from 67% to 34%.

A rival hypothesis was established, stating that the revisions had occurred based on the NHIA's own plans and timetable. Evidence was collected and analysed on both hypotheses. Some of the main evidence could be summarised as follows.

- Evidence was collected around the interest evoked by the controversial report. This included quotes from key stakeholders, media articles, blogs, and even published responses by the NHIA. This evidence was used to conclude that the report had dominated the health sector debate in Ghana for a period. This could perhaps be seen as passing a 'hoop test', because if the report had not inspired any interest it would be hard to see how it could have influenced government.
- Other campaign members stated that the NHIA had revised its methodology based on public demands resulting from the report. The plausibility of this evidence was enhanced by factors in the external environment, including forthcoming elections in Ghana (which made politicians more susceptible to external pressure). This could perhaps be seen more as passing a 'straw in the wind test'.
- At an international health meeting in Geneva, the Ghana delegation stated that Oxfam's report *"was very helpful and prompted us to revise our figures"*. This can be seen as a 'smoking gun' as it is unlikely the Ghana delegation would have made this comment if it were not true.
- There was no convincing evidence that the changes were the result of the NHIA's own plans and timetables. Indeed the NHIA had publicly contested the view that there were any flaws in its methodology a few weeks before making the changes. This can therefore be seen as a failure of the 'hoop test' for the rival methodology. If the NHIA had been planning to make the changes anyway it is very unlikely it would be contesting those very changes so close to revision.

The conclusion of the evaluator was that the rival hypothesis did not hold, and that the Oxfam campaign had indeed had a major influence over government decision-making

Source: Punton and Welle (2015) based on Stedman-Bryce (2013)

there are already examples of CSOs adapting process tracing to make it more sensitive to multiple contributions.

Process tracing can explain how and why a change occurred, which is particularly useful when looking at how to expand or replicate work that has led to positive changes. Process tracing can therefore be an important supplement to quantitative methodologies, which tend to show whether or how far a change has happened, but not always how or why.

Another strength of process tracing is that it can be applied to virtually any change, provided there is sufficient evidence to confirm that the change has taken place. Successful application of process tracing does not require a project or programme baseline or control group, and does not even need monitoring to have been carried out over the course of a project or programme. Process tracing is part of a group of methodologies (including the most significant change technique and outcome harvesting) that work by first measuring change and then working backwards to assess contribution.

However, process tracing can seem confusing and a little academic for new practitioners, especially when so many of the formal guidelines are based around simplistic scenarios. (For example, one famous case study for process tracing is based around a Sherlock Holmes mystery where a murder has been committed and only one of the potential suspects must have committed the murder.) Some evaluators have therefore struggled to systematically apply the process tracing tests. It is to be expected that this will become less of a problem as more and more examples of process tracing application within social development are documented.

Another challenge is that process tracing, if done in a participatory way, requires a large amount of project or programme staff time. This includes the time needed to understand the methodology, develop and describe multiple hypotheses, collect and analyse evidence and report on findings (see Talcott and Scholz 2015). CSOs therefore need to carefully decide whether or not process tracing should be applied within a project or programme, based on how useful the findings are likely to be.

Process tracing, if done properly, also requires a lot of evidence to be generated. It is sometimes hard enough to collect sufficient evidence to assess one particular version of change, let alone collecting evidence on multiple hypotheses! There is a danger that the task may become too great, and one or more hypotheses may not be properly tested. In these situations, process tracing may lead to unproven or unclear conclusions.

Finally, process tracing is designed to cope with known changes, with clear potential pathways to change. It is more difficult to apply when changes are uncertain or unknown. But many evaluations are designed and commissioned before the results of a project or programme are known. This means there is a risk that evaluators hired for their knowledge of process tracing will be unable to find good changes on which to base their analysis. This is not a weakness of the methodology itself. However, it is a real issue in the context of social development where good practice suggests it is useful to plan an evaluation right from the start of a project or programme.

Further reading and resources

Other papers in this section of the M&E Universe deal with some other methodologies that can be used for qualitative analysis. These include contribution analysis, outcome harvesting, the most significant change technique and qualitative comparative analysis (QCA).

- Contribution analysis
- Outcome harvesting
- Most significant change
- Qualitative comparative analysis

There are a number of academic articles covering process tracing, including some included in the references below. One of the most useful is the article by Collier (2010) which also contains a series of exercises that can be used to train practitioners. Three other documents (Punton and Welle (2015), Talcott and Scholz (2015), and Oxfam (2011)) address some of the ways in process tracing has been applied by CSOs to-date.

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INTRAC is a not-for-profit organisation that builds the skills and knowledge of civil society organisations to be more effective in addressing poverty and inequality. Since 1992 INTRAC has provided specialist support in monitoring and evaluation, working with people to develop their own M&E approaches and tools, based on their needs. We encourage appropriate and practical M&E, based on understanding what works in different contexts.