12. Which Unknowns?

To examine the question '*Which unknowns are considered?*', the elements introduced in Chapter 5 for knowledge synthesis—taking a systems view, scoping, boundary setting, framing, taking values into account and deciding which differences to harness and which to manage—are also relevant.

Taking a Systems View

Chapter 5 made the point that there is no one way to take a systems view, and that the various systems approaches provide diverse ways of looking at complex real-world problems. To the best of my knowledge, there is no comprehensive explication of how different systems views deal with unknowns, but it is possible to list a range of examples, such as

- in drawing conceptual maps the strength of evidence for different elements and relationships can easily be depicted, allowing known unknowns to be highlighted
- in soft systems methodology the different world views that people bring to the table may be used to uncover both tacit knowledge (unknown knowns) and unknown unknowns
- causal loop diagrams can highlight likely unanticipated adverse outcomes
- in mathematical models of systems, techniques like calculations of probabilities and sensitivity analysis can be used to determine the degree of uncertainty around the model outcome
- conceptual or mathematical models can be devised for different scenarios of the future on particular issues, allowing a range of possible outcomes to be explored.

Tasks for the I2S Development Drive
Collect case examples illustrating how different systems approaches are useful for describing a complex problem, as well as for dealing with diverse unknowns. Work with systems experts to produce a guide to the broad range of systems approaches to a complex problem, emphasising the different ways they provide to understand and manage diverse unknowns.

Scoping

The principle underpinning scoping is to broaden the range of considerations that the integrative applied research team takes into account, making the needs of the problem central rather than the researchers' expertise. This is particularly important when it comes to unknowns because, as described earlier, most researchers are trained to think about unknowns in very specific and limited ways.

The overall aim of scoping then is to broaden the view of unknowns. This can be undertaken in several ways. As outlined in Chapter 10, taxonomies and other classifications can provide starting points and stakeholder concerns can highlight unknowns that disciplines would ignore. It can also be helpful to look at the approaches of disciplines in a new light, not only revisiting unknowns they would normally banish from consideration, but also looking at unknowns at the intersection of disciplines, as well as unknowns that are highlighted when different disciplinary perspectives are contrasted.[1] A particular challenge for scoping in integrative applied research is that, with unlimited unknowns, the task of scoping is potentially endless.

The development of effective scoping methods that are fruitful and not overwhelming is therefore imperative. A way forward may be for teams to start to formulate key questions, including: are there areas that are deliberately ignored or taboo and are they significant? Can particular vulnerabilities to unknown unknowns be identified? Are important areas being ignored because methods for tackling them do not exist? There is substantial room for innovation here.

Tasks for the I2S Development Drive
Gather together literature and undocumented practical experience providing concepts for scoping unknowns, methods for undertaking it and illustrative case examples. Produce a guide to all the potential ways of considering diverse unknowns including taxonomies, different approaches of disciplines and stakeholders, and unknowns that would be banished in discipline-based research. This requires collaboration with experts in thinking about unknowns, as well as discipline and stakeholder experts interested in unknowns.

1 For example, comparing statistics and history, as was illustrated in Chapter 10.

Boundary Setting

Boundary setting determines which of the possibilities identified through the scoping process can realistically be considered in the integrative applied research. For complex real-world problems it is critical to identify and deal with the unknowns that are most significant for the issue under consideration, even though this may not be easy. Some unknowns may not be well understood or may be complicated to take action on. The challenge is to avoid defaulting to 'business as usual', where such unknowns are simply banished from consideration. It is only by responding—however clumsily at first—that ways of accounting for such unknowns will improve.

Boundary setting always involves making trade-offs, doing one thing at the expense of something else. The point of linking scoping and boundary setting is that it moves the integrative applied research team away from dealing with the unknowns with which it has the most experience to those that are central for understanding and managing the problem. One essential ingredient is the ability to learn from experience. This requires documenting the decisions made in boundary setting and the rationale for them, as this will form the basis for evaluation and learning to improve future integrative applied research.

Tasks for the I2S Development Drive
Collate published and unpublished concepts and methods for boundary setting, along with case examples that emphasise how and why decisions were made. Develop boundary-setting methods to allow the most significant unknowns to be identified.

Framing

The way the problem is presented signals the approach being taken to unknowns. Some of the challenges have been alluded to earlier, particularly to avoid the extremes of overconfidence at one end and nihilism and despair at the other. Another potential difficulty is that a focus on unknowns, particularly those that are not well characterised and for which there are no clear-cut responses, can make the researchers seem ignorant or 'flaky'. A good example here is the reaction that talking about unknown unknowns often provokes, where the concept is seen as laughable and those raising it as stupid.

Tasks for the I2S Development Drive
Draw together useful concepts and practical methods for framing, along with case examples of when it has worked well and when it has failed. Develop new ways of framing unknowns that signal their importance and potential for achieving better outcomes on complex real-world problems.

Dealing with Values

Taking a broad approach to understanding and managing diverse unknowns is in itself a value position, but in general the link between values and unknowns does not seem to be well developed in the research context. Whose unknowns are considered to be important—in other words, which disciplinary and stakeholder concerns are taken into account—will also reflect the values in play. For example, weighing up the unknowns that worry stakeholders affected by the problem is congruent with democratic values, and if these stakeholders are otherwise generally marginalised it is also in line with liberal values.

Philosophy can provide useful insights. For instance, in the diamorphine prescription feasibility research, we were fortunate to receive guidance from philosopher Robert Goodin. He alerted us to different ethical approaches to the trial risks, particularly contrasting utilitarian and deontological approaches.[2] He helped us understand that we were taking a utilitarian approach, which involves looking at comparative risks and leads to support for a trial if the risks are likely to be less than those that would occur without a trial. Some trial opponents on the other hand were using a deontological approach, which effectively argues that a trial should not go ahead if there is any danger of major risks, regardless of what would happen without a trial. We learnt to appreciate that these perspectives are not reconcilable.

Tasks for the I2S Development Drive
Compile case examples that illustrate different experiences in bringing values into play and their consequences for understanding and managing diverse unknowns. Work with applied philosophers and other experts to produce a guide to concepts and methods for understanding and responding to the various dimensions of values.

2 Ostini et al. (1993).

Harnessing and Managing Differences

Members of integrative applied research teams will differ in their understanding of unknowns and the range of management strategies they consider acceptable. This can result from their disciplinary training and professional experience, as well as personality and cultural background.[3] For example, as I have outlined earlier, statisticians and historians generally have very dissimilar orientations to unknowns. The unknowns that concern stakeholders may be different again. Furthermore, personality distinctions between 'well-adjusted' and 'authoritarian' types, as described in Chapter 10, may also come into play.

The challenge is to identify and deal separately with two types of differences

1. those relevant to developing a more comprehensive way of understanding and managing the unknowns most germane to the problem, which need to be harnessed
2. those that may get in the way, which need to be managed.

For example, it may be desirable to harness the expertise of team members with strengths in understanding different unknowns, such as distortion, probability and taboo. On the other hand, if some team members have very fixed and limited views about unknowns, this may need to be managed so that it does not impede consideration of this domain in the integrative applied research.

Tasks for the I2S Development Drive
Gather together concepts and methods for understanding differences, as well as for harnessing and managing them, along with illustrative case examples.

Dealing with the Six Categories

Requirements for iteration and evolution, as well as moving beyond a formulaic way of proceeding, are just as relevant in this domain as they are in knowledge synthesis. In other words, planning the consideration of unknowns can start anywhere (that is, it may start with framing or a value position rather than the systems view or scoping) and it is likely that each of the six categories will need to be considered a number of times in the preparatory phase. Each category is also likely to require review from time to time as the research progresses. This may include asking questions like: how should an unknown that was discovered to be central after the planning phase be incorporated into the research process; how can the loss of a particular team member's skills in dealing with unknowns

3 Smithson (2008b).

be accommodated; and does the framing really convey an accurate view of what the research is aiming to achieve? The six categories provide a focus for the iteration, which is necessarily a messy process. They allow the research to be organised so that important elements can be documented and communicated.

Task for the I2S Development Drive
Compile case examples of how iterative processes between these six categories of concepts and methods played out.

This text is taken from *Disciplining Interdisciplinarity: Integration and Implementation Sciences for Researching Complex Real-World Problems*, by Gabriele Bammer, published 2013 by ANU E Press, The Australian National University, Canberra, Australia.