Chapter 3. Selecting and using theory

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Key points:

- Theory underpins all research, and all systematic reviews
- Though not universally accepted, the explicit use of theory is becoming a mainstream approach to reviewing
- Theory can be used throughout the review design and conduct, such as underpinning the search, eligibility criteria, analysis, interpretation, and communication
- Qualitative evidence syntheses and mixed-method reviews with a qualitative component can use theory as well as produce theory. The focus of this chapter is on the use of theory.
- In order to make the best use of theory it may be necessary to synthesise existing theories
- The chapter also covers review designs whose purpose is to synthesise theory for use in future systematic reviews and or primary research

3.1 Introduction

There is a growing recognition that it is important to consider theory in the context of evidence synthesis and theory is becoming central in increasing numbers of reviews. Theory can be used throughout the design and conduct of a review including question development, refining the scope, the search, eligibility criteria, data extraction, analysis and synthesis, interpretation, and communication. Cochrane has produced guidance on the selection and use of theory in intervention effectiveness reviews (Noyes et al 2015),

which is relevant to both Cochrane and Campbell reviews and can be located on the accompanying handbook website. This guidance should be read in conjunction with this chapter. There is however little guidance on the use of theory in qualitative evidence syntheses (QESs) and mixed-method synthesis with a qualitative component. This chapter aims to fill this gap in the following ways.

The chapter begins with a discussion of the main types of theory and the way that they underpin all research. It then goes on to consider the role of theory within a QES before moving on to detail how theory is used in a systematic review. Guidance on how to select theories for use is provided along with questions to ask when making a selection. The chapter then considers how to synthesise theories within a QES, and within other types of reviews whose primary purpose is to synthesise theory to underpin future systematic reviews or primary research. A worked example illustrates the role and use of theory within one specific review. The chapter concludes with consideration of issues of equity, diversity and inclusion, and reflexivity, in relation to theory and how theory can facilitate stakeholder engagement and involvement.

3.2 What is theory?

Theory underpins all research and knowledge, whether stated explicitly, or used implicitly. For example, the guidance contained in Chapter 5 states that review authors should plan their search carefully so as not to miss important studies. This guidance is based on numerous theories about the consequences of missing studies on the reliability and validity of review findings, and on theoretical knowledge about how to search the literature effectively. These theories were developed over time and are based on evaluations conducted in previous systematic reviews, and the experience and expertise of chapter authors.

Several important characteristics of theory can be identified using this simple example. First, a theory is the outcome of a form of knowledge synthesis, where different forms of knowledge (including other theories) are assembled to understand or describe a phenomenon. In this case, evaluations of the outcomes of previous searches have been used alongside the personal experiences and professional training of chapter authors to understand (and therefore predict) the outcomes of failing to search properly. Second, the theory needs to define the concepts it uses and how they relate to one another. For example, a theory of how to search in systematic reviews includes concepts such as bias and comprehensiveness, and how one might impact on the other. Third, the theory enables authors to generalise from the specific to the general. This is a key characteristic of scientific theory, where patterns identified in specific data (i.e. evaluations conducted in specific prior systematic reviews) are abstracted into general rules that can be applied to future scenarios (i.e. the consequences of searching using particular methods in the future).

In science, the objective often appears to be the discovery of new theories (or ‘laws’) of nature. These are held to be universal, that apply at all times in all parts of the universe. For example, Newton’s laws of motion were held to be universal, accurately describing known phenomena at the time. However, Einstein showed that Newton’s starting premise was

flawed, and that his theories needed to be updated. This highlights another important characteristic of scientific theories: that they are open to challenge and can be modified, or abandoned altogether, if new evidence arises (see (Popper 1963)). This example also highlights possible differences between scientific disciplines in the ambition and scope of their theories. While some disciplines, such as mathematics and physics may be concerned with developing theories that apply throughout the universe, others such as biomedicine, psychology and sociology, might regard their theories as being more bounded within a specific context (such as the practice of medicine – or systematic reviewing).

Finally, we should note that theories can appear to be quite different to one another, with some being the outcome of a synthesis of other theories (e.g. logic models and conceptual frameworks – see below), with others appearing to be simple 'stand-alone' statements. These differences may simply be due to the way that the theory is described though, rather than being a real difference in type. For example, the theory about systematic searching builds on the notion of publication bias. It may simply say that certain steps are necessary to overcome publication bias, without necessarily saying more than defining publication bias as being a tendency for studies with positive, novel, or statistically significant results to be more likely to be published than those with negative or non-significant results. However, the concept of publication bias itself is defined by multiple contributing theories, including those concerned with researcher career pathways, power and status, institutional pressures, and economic and market forces. In order to use the theory of publication bias in another theoretical framework (see below), such as searching, it is not necessary to engage with theories about markets and economics though, as doing so would be unnecessarily complicated and confusing. Instead, the outcomes of publication bias are taken to be true: that certain types of research are more likely to be published than others, and the implications of this for searching are then acted upon. Thus, the way that a theory is expressed, and the way it may treat theoretical concepts it contains as 'black boxes' is determined by how the theory will be applied and communicated.

While theories underpin all the methods used in a systematic review, such as where and how searches for studies should be undertaken, the focus of this chapter is on theory in relation to a review's questions, how it is scoped, and how the review will contribute new theory to the evidence base or develop understanding of existing theory.

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In the context of a systematic review, theory can be understood to be:

> *… A system of interrelated propositions that should enable phenomena to be described, explained, predicted or controlled (Duldt and Griffin 1985, p1)*

Before examining the use of theory in reviews in detail, the diversity of meanings that 'theory' encompasses will be examined.

3.2.1 Different types of theory

Theory is used by all academic disciplines to organise and explain phenomena in their fields. Theories are often tested through experiments or other systematic data collection to support or refute their claims. For example, while there may be a plausible theory (or multiple theories) for expecting that a given education intervention helps children to self-manage their asthma, other theories may explain why the intervention may be harmful in some situations, or simply not as good as alternatives in others. Researchers conduct experiments, often as randomized trials, to establish whether the intervention does indeed achieve the desired effect: i.e. that the theory is supported by real world experience. Within the Cochrane and Campbell collaborations when they were first established, and wider in some sections of scientific communities, theory has been largely understood as a hypothesis-generating device: hypotheses would then be tested in randomized trials before conclusions could be drawn. Thinking has moved on, and it is important to acknowledge that not all theories require testing before they are taken as essentially 'true'. No one would advocate a randomized trial to test whether someone is better off jumping with, or without, a parachute, given the strong theoretical evidence (Yeh et al 2018). Moreover, it is not possible to gather direct observational data on people's motivations and the meanings they ascribe to phenomena, as this perceptual and experiential information is essentially 'hidden', and can only be accessed through what they say.

The notion that unobservable, but significant, phenomena can be responsible for observable outcomes is critical for understanding why theory is so important in research and in our ability to understand the world. For example, while a researcher might theorise that peer pressure is responsible for drug misuse in some situations, they cannot see this 'pressure'; the researcher can only observe the dialogue and behaviour of some people in some situations, and infer that this results in internal psychological pressure. Thus they might theorise that an unseen 'mechanism' (or 'mechanism of action') explains why an effect is observed in one situation, but not in another. Mechanisms are variously defined, but are generally understood as the

> *underlying entities, processes, or structures which operate in particular contexts to generate outcomes of interest (Astbury and Leeuw 2010)*

Theories that aim to encapsulate people's understandings are built through qualitative and quantitative research, capturing not only perspectives, but the meanings that they attach to phenomena. We construct theories that explain actions and motivations at the individual level to explain, for example, why someone might decide to quit smoking at one given moment rather than another (see, for example, DiClemente et al 1991). Theories can also explain the beliefs and behaviours of people in groups, at the level of society, and the interactions between individuals and the social / physical environment in which they live. Different types of theory are valued and prioritised by different academic disciplines. For example, broadly speaking psychology tends to focus on developing theories to understand individual behaviour, whereas sociology develops theory to explain the social world.

In 1949 the sociologist Robert Merton separated theory into: 'minor' (also called 'low level') theories, made up of working hypotheses and definitions without an organising framework to relate them to one another; 'mid-range' theory, which relate concepts with one another in order to make predictions about individual or social behaviour in specific situations; and 'grand' theories which provide a high-level explanation for widespread social phenomena (e.g. feminism) (see Merton 1968). 'Peer pressure', as described above, would be a 'low level' theory, since it encapsulates a specific phenomenon: the unobservable psychological phenomenon that can result from an individual's engagement with other people. If the concept of peer pressure were expanded into a general theory of group behaviour (e.g. Merton's theory of reference group behaviour), this would be a 'mid-range' theory, since it relates multiple concepts with one another and predicts events / outcomes in specific situations. Most systematic reviews synthesise theory at the 'low level' (conceptual) and 'mid-range' levels, and few (if any) synthesise 'grand theory', though review authors would want to consider how grand theory, for example feminist perspectives or critical theory, might have informed their perspectives throughout the review (Noyes et al 2016).

This chapter focuses on 'low level' and 'mid-range' theory and considers three ways to express these types of theory – in a conceptual framework, logic model or theory of change - which have specific functions within a systematic review. A review's *conceptual framework* presents a mid-range theory that encapsulates the dynamics and characteristics of the research participants, their social and environmental context and intervention(s) (if any). Sometimes the conceptual framework remains static throughout the review, but sometimes it is updated as the review progresses, and further evidence comes to light. Programme theories, often represented in graphical form in a *logic model* (see chapter 4), relate multiple low level and mid-range theories to one another to represent how an intervention (or class of interventions) is thought to influence and impact on specified outcomes. Lastly, a *theory of change* is a specific low-range theory which links a cause (usually an intervention) with a defined outcome. Theories of change add precision to the logic model – they present a deeper account of the causal and explanatory processes that link activities and outcomes. Returning to the asthma example, a logic model may be useful for theorising that teaching asthma self-management skills in schools may help children feel empowered in managing their asthma, particularly among children who may not have regular interactions with a primary care provider; however, a theory of change would also involve further theorising around what type and how much self-management education might be required to create a change in outcomes.

In conclusion though, it is important to bear in mind the point highlighted in the previous section: that at their most fundamental level all theories define concepts in a domain, how they relate to one another, and (often), what might happen under specific circumstances (Wacker 1998). A theory might be expressed as a single term or phase, such as 'community engagement' in the worked example below. This is helpful in situations where someone might want to describe an intervention quickly as using 'community engagement'. However, beneath this single term, a complex web of supporting theory can be found, as detailed in the worked example and Figure 3.3. Likewise, the low-level theory 'peer

pressure' and the grand theory 'feminism' can both also be unpacked into their own networks of supporting theories (Quine and Ullian 1970, Ostrom 2007). The work of unpacking concepts, and constructing new theoretical relationships, are both important processes and outcomes of qualitative evidence syntheses.

3.3 The role of theory in qualitative evidence syntheses

3.3.1 Points in the review process where theory is used

In QES, theory is used in different ways (see Figure 3.1), and QESs and mixed-method reviews with a qualitative component can use theory as well as produce theory. Some reviews start with an explicit pre-existing theory (such as many forms of Framework synthesis (see chapter 9), others discover and develop theory as their main objective (see chapters 10, 11 and 16 on thematic synthesis, and meta-ethnography and realist synthesis), and others use theory to explain findings (see chapter 14 on mixed-methods). All evidence syntheses use theory to some extent, to define their research questions and concepts, though the degree to which this is explicitly stated and acknowledged varies. Noyes and colleagues (2016) report review authors as saying that theories enabled "a greater depth of inquiry and more nuanced interpretations of findings" (p.88.) in their reviews than would otherwise have been the case. Specifically, use of theory could result in the review process being conducted more efficiently (particularly in relation to data extraction and using an interpretive lens).

Every review team needs to agree upon and establish the scope of their review, the questions to address, and how they will be answered (see chapter 2). This requires agreement on what is to be investigated. Here, 'low level theory' is essential in providing definitions of key concepts for the team to discuss and agree upon.

The background section in a review report often covers theories about the phenomenon under review (for example the Cochrane intervention review report template contains a section about how the intervention(s) might work). In an intervention review, this section sometimes articulates mechanisms of action (for both pharmaceutical and non-pharmaceutical interventions) and sometimes mid-range theory to specify in detail the interacting components of a system within which the intervention is to be introduced. In short, the background section outlines why the review is needed, its potential contribution to existing knowledge, the assumptions and definitions it will draw upon and, for intervention reviews, how the intervention interacts with the people and wider context in which it is introduced.

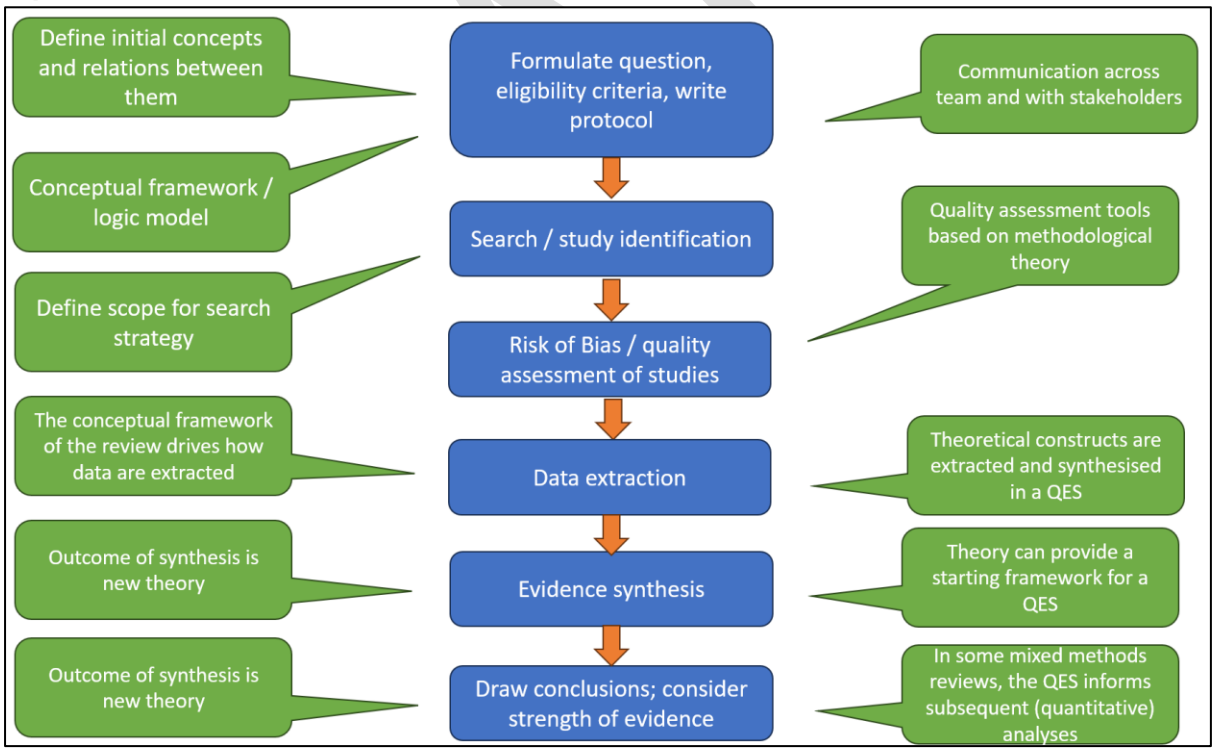
Some review teams may need to compile the initial starting definitions and theories within an overarching conceptual framework or logic model, particularly if their review needs to address issues of intervention (or other) complexity (see Chapter 2 on question formulation and Chapter 15 on realist reviews). This is particularly important in reviews where outcomes are separated from interventions by lengthy causal chains (or pathways). For example, a review evaluating the effect of paracetamol on headaches has a short causal pathway to

consider: when a trial participant has a headache, they take the paracetamol and record whether the headache improves over a short time period. But in a review evaluating the effect of, for example, community engagement (O'Mara-Eves et al 2013) to promote smoking cessation, the causal pathway includes: the participants 'engaged' in the process; members of the target population being prompted to take action; deciding to quit (and whether to seek support); and then the process of maintaining their smoke-free status. With numerous possible 'routes' through the pathway from, for example, reading a leaflet to actually stopping smoking, developing a model which encapsulates these routes – and the mediators and moderators of success – is essential for clarity in the review scope and analysis.

While methodological theory is not discussed further in this chapter, it is worth noting that this type of theory informs much of the review process, including the methods of synthesis and the quality assessment (or risk of bias) tools used.

Figure 3.1 summarises some of the main points in the review process where theory is often used in a systematic review and QES.

Figure 3.1: main points in the review process where theory is used



3.3.2 The position of theory in Cochrane and Campbell systematic reviews

When the Cochrane and Campbell Collaborations were established, their systematic reviews focused almost exclusively on questions relating to the effectiveness of interventions by synthesising the results from randomized trials. This reflected an overriding priority in Evidence-Based Medicine (EBM) more broadly for robust and

internally valid evidence to demonstrate with a high degree of confidence whether or not a given treatment *caused* an outcome. This located the Collaborations within an empiricist probabilistic epistemology, valuing evidence based on verifiable facts to be experimentally tested and reproduced. While theory was present throughout their reviews, both in the assertion that the best evidence for decision-making was necessarily probabilistic, and in how and why interventions worked, theory as a basis for decision-making itself was marginalised and seen as potentially untrustworthy and open to bias. Commentators reflected this scepticism: "We need less rather than more focus on high-level theories, less rather than more jargon, less dogmatism, more common sense, less theoretical work, and more rigorous evaluations that include direct measurement of important outcomes." (Oxman et al 2005) p 115. While this anti-theory argument itself relies heavily on theory rather than empirical data, well-evidenced arguments provide strong reason for caution if drawing strong conclusions on the basis of (some) theoretical claims (Howick et al 2013).

An exclusive focus on 'direct measurement' however, limits the types of question that a Cochrane or Campbell Review can address. For example, there might be a need to understand people's motivations and responses to peer pressure, and how social power is exercised and experienced, to inform a decision about which intervention a decision-maker might select. This kind of knowledge is obtained using qualitative forms of enquiry, the outputs of which are theories about people's different experiences and responses to peer pressure. Thus, the focus of an evidence synthesis of these types of question is necessarily 'theory', requiring methods of analysis appropriate to this type of research. This type of evidence synthesis also then requires contributions from many disciplines and using different types of study design – whether they be 'observational' or 'qualitative' (Greenhalgh et al 2014, Kelly 2018). In section 3.4.1 a worked example shows eleven ways that theory can contribute to a systematic review.

Systematic reviews answering diverse research questions and using the full diversity of study designs are now common, with theory being used explicitly in many parts of the review process. This is a relatively recent advance however, and methods, tools and standards are still being developed, drawing on established methods commonly used in qualitative approaches to primary research (Noyes et al 2016).

3.4 How to use theory in systematic reviews

3.4.1 A worked example of the use of theory

In order to anchor subsequent discussion about how theory can be used in systematic reviews, the following example shows the roles theory played within a mixed-methods review with a qualitative component that synthesised research on community engagement interventions to reduce inequalities in health (O'Mara-Eves et al 2013). Theory was pivotal throughout this review and drove both qualitative and quantitative syntheses and subsequent overarching synthesis. This example is chosen to demonstrate eleven ways in which theory can be used in systematic reviews (the narrative references items on this list using #); this is atypical, most reviews use theory in some, but not all, of these ways:

Setting scope / understanding focus of enquiry

1. To define initial concepts and how they relate to one another
2. To communicate an understanding of the review context and scope in a holistic way to advisory group and other stakeholders, and to receive feedback in a way that could make a difference to the review
3. To identify a scope from which to develop a search strategy; particularly useful when shaping the search for theoretical literature
4. To 'test' the initial conceptual framework when the team examined the theoretical literature, which was subsequently revised substantially to take on board the diverse new perspectives the theoretical synthesis provided
5. To use the revised conceptual framework to provide the team with a holistic picture of their considered understanding of the domain, which could then be communicated to, and used by, other researchers and practitioners
6. To use the conceptual framework to enable the team to locate their review within existing scholarship
7. To provide conceptual organisation to the wider field, including future systematic reviewers, based on the conceptual framework and analytical work done within the review

Interpreting the evidence

8. To make decisions on how to use two external tools, one topic-based tool; and the domain-based PROGRESS-Plus tool (see also section 3.6 on equity below).
9. To identify pathways within the conceptual framework that encapsulated some of the core mechanisms through which community engagement was thought to operate
10. To test particular causal strands within the larger theory via statistical meta-analysis
11. To support a thematic synthesis of the findings of process evaluations to examine issues around the implementation of community engagement.

Its review questions included:

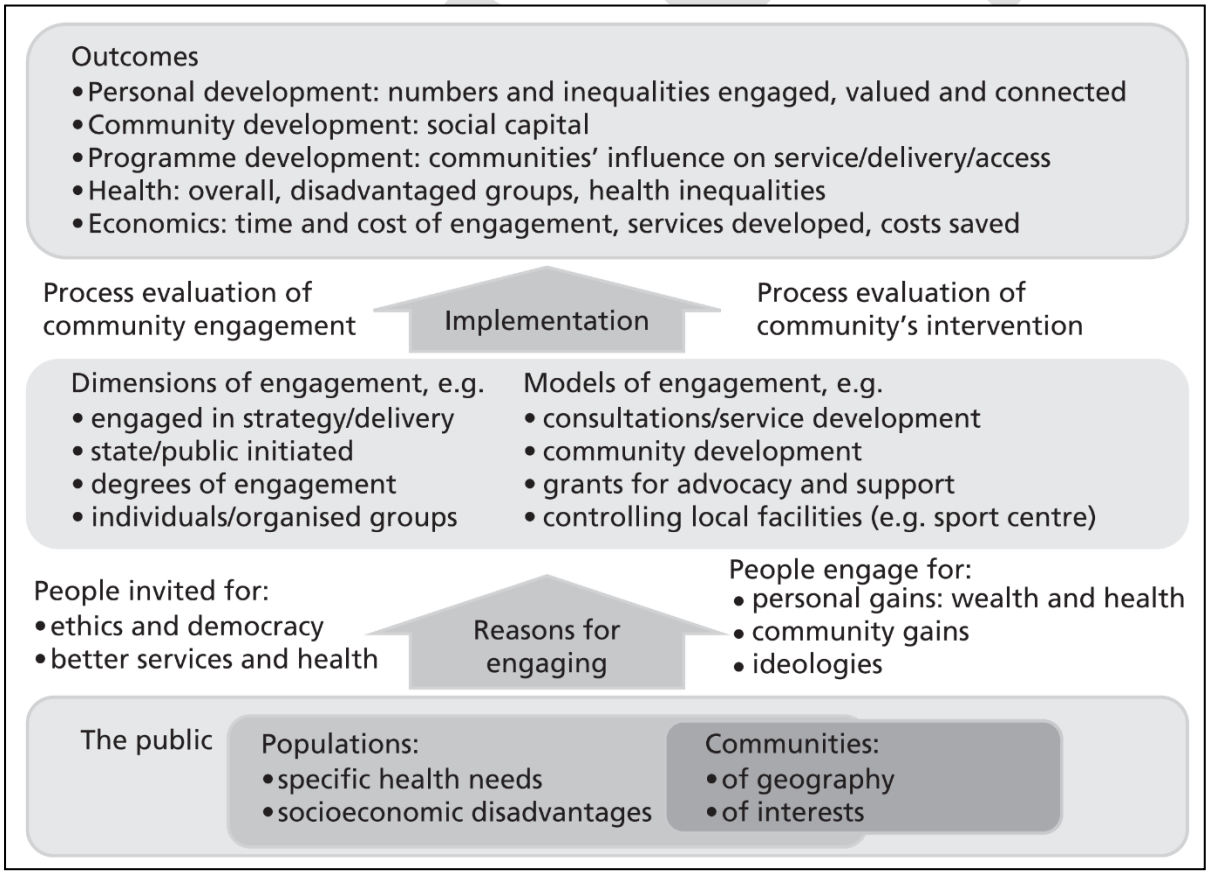
- RQ1: What is the range of models and approaches underpinning community engagement?
- RQ2: What are the mechanisms and contexts through which communities are engaged?
- RQ3: Which approaches to community engagement are associated with improved health outcomes among disadvantaged groups? How do these approaches lead to improved outcomes?

As the research questions make clear, an important objective of the review concerned theory: identifying models of community engagement and considering the mechanisms through which communities were engaged. The research questions also examined effectiveness however, and asked the mechanistic question 'how' does community engagement lead to improved outcomes. Because of the breadth of questions, this review sought diverse literature, including:

- Theoretical literature on community engagement
- Randomized and non-randomized trials evaluating the effectiveness of community engagement interventions
- Process evaluations, as integrated within included trials

Qualitative data were drawn from the theoretical literature and the process evaluations. The 'cascading' effect of the initial decision to ask questions beyond effectiveness led the review team to look at diverse research, but then also required the team to utilise varied synthesis methods to answer their review questions. At the outset, the team developed an initial conceptual framework that covered the populations of interest, reasons for engagement, the implementation of interventions, and the final outcomes observed (Figure 3.2) (#1 from the above list of how theory can be used). This framework mirrored the original commissioning brief which defined community engagement as 'approaches to involve communities in decisions that affect them'.

Figure 3.2: initial conceptual framework for review of community engagement interventions (O'Mara-Eves et al 2013)



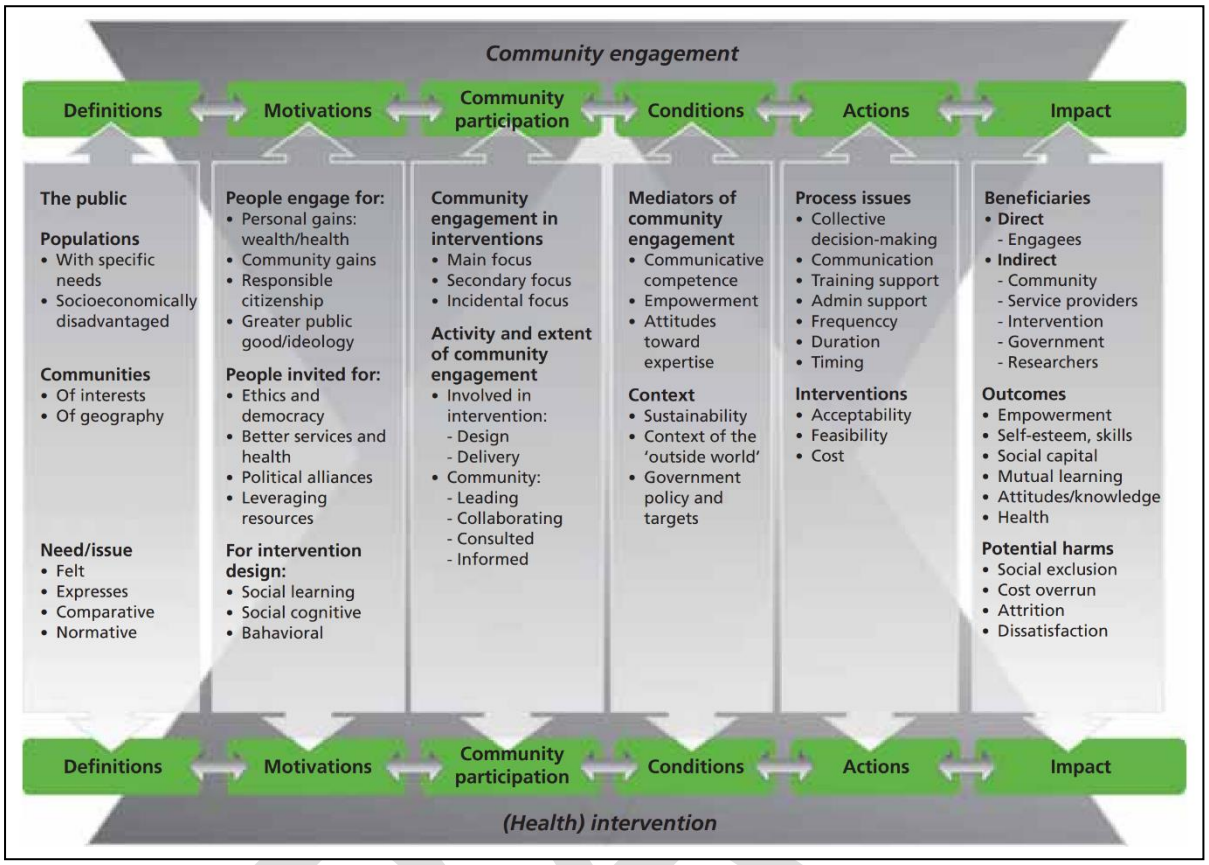
The concepts used in the search strategy were then driven by the initial conceptual framework (#3). The search used two different 'paradigms' for searching in systematic reviews. First, a conventional search strategy for trials examining intervention effectiveness

– aiming to find all relevant studies – to minimise possible bias. When identifying the theoretical literature (which included conceptual overviews, position pieces and discourse analyses), a purposive search and inclusion strategy, which was iterative and involved following conceptual and citation connections through the literature, was considered appropriate (see chapter 5 on searching).

A 'rolling' or 'constant comparative' theoretical synthesis was undertaken to detect and characterize models, approaches and mechanisms underpinning community engagement. The team compared the theories and findings extracted from each study with the conceptual framework to see whether issues in each paper refuted, confirmed, or added new information to the model (#4). The conceptual framework was amended and extended as new issues were discovered. This analysis did not aim to aggregate or count the number of times a given concept was observed, but to build up as complete a picture as possible of the diverse models, approaches and mechanisms. In addition, the emerging conceptual framework was shared with stakeholders, and was the basis for an in-depth discussion with them about its overall framing, and the relationships between the concepts it contained (#2). As a consequence, the initial conceptual framework was completely revised to recognise that two distinct schools of thought ran through the community engagement literature: the first is rooted in the ethical imperative of social justice, community development and community engagement as an end in and of itself; the second is utilitarian, being concerned with engaging communities as a means of improving people's health. Sometimes it is not easy to reconcile theories with differing theoretical and disciplinary roots, and this is an example of how recognising the quite different framing of research in this field helps readers to understand the motivations and rationales behind the interventions in question.

This example also demonstrates how 'mixing' theories from quite different perspectives produces new schools of thought and approaches to intervention. The two perspectives in this example – furthering social justice, and improving health – are not completely incommensurate, but have different ethical and political imperatives which, some have said, has led to the weakening of the social justice element. This may be the case, but it is also true that this has led to the integration of thinking from the social justice / community development literature in public health interventions.

Figure 3.3: Revised conceptual framework for review of community engagement interventions (Brunton et al 2017)

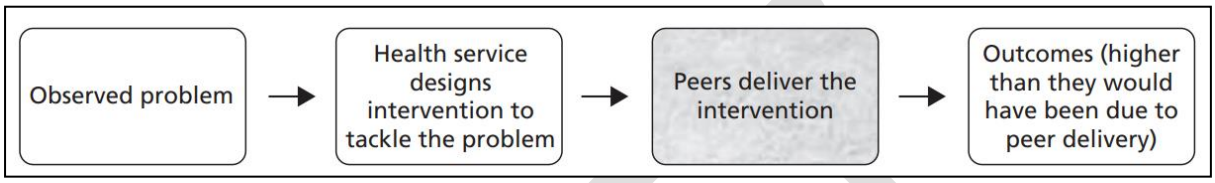


The revision of the conceptual framework was iterative, and the team maintained a log of revisions, documenting shifts in thinking during the review process (Brunton et al 2017) (#5). Critical moments included meeting with the review advisory group (which challenged fundamentally the team's starting assumptions and initial framework) and further exploration of the theoretical literature. As well as reflecting the two schools of thought, the revised conceptual framework (Figure 3.3) reflected the complex system within which community engagement interventions had been evaluated. For example, the literature revealed that participants' prior experience of community engagement interventions was a major factor in how they might engage, or not engage, in the future. Thus, the conceptual framework changed from its initial linear representation (Figure 1) to a model containing feedback loops where multiple mechanisms impact at almost any point in the process (Figure 2). (See also 'complex adaptive systems' for theoretical work in this area. (Petticrew et al 2019)) This is a clear example of item #6 in the list above – of the conceptual framework enabling the review to be located within existing scholarship – and also of item #7, where the analytical work done in the review can itself contribute to the conceptual organization of the field.

Addressing the first two review questions created a new framework for understanding the theoretical and evaluation literature: a useful product in its own right as well as a

theoretical framework for use in subsequent research projects. Within the review though, the review team then used this large and abstract picture to identify specific pathways (which together formed a theory of change (see above)) These four pathways connected specific types of community engagement with specified outcomes as depicted in Figure 2,3 (#9). Interventions which matched, or did not match, the characteristics identified in these pathways of change were compared in a meta-analysis (#10), enabling the review to address review question 3.

Figure 3.1: theorised pathway for peer-/lay delivered interventions (O'Mara-Eves et al 2013)



Two other important touchpoints with 'external' theory are worth noting (both examples of low-level theories that helped the team organise their thinking with respect to health equity (Noyes et al 2015). As the team needed to understand which domains of inequalities were 'targeted' in each study, it drew upon a pre-existing conceptual framework called 'PROGRESS-Plus' (see also Chapter 1 and the section on Equity, diversity and inclusion (3.6) below). The review also needed to 'speak' to the specific UK decision-making context, and for this it used priority topic areas identified in a review of health inequalities (these included 'health risks', 'best start in life' and 'prevention of ill health') (Marmot et al 2019) (#8).

Finally, the team also identified process evaluations that were conducted alongside the effectiveness evaluations included in the meta-analysis (#11). Rather than using a pre-identified theoretical framework, which was subsequently found not to encompass the diverse issues they had encountered, they pivoted the planned framework analysis to an open conceptual structure using thematic synthesis (see chapter 10). The thematic synthesis enabled the review to address review questions 2 and 3 in detail and develop recommendations for future implementation.

The case study is an example of where theory was identified, synthesised, used, and developed further through the review findings, and the updated theoretical framework was reported as a separate output of the review (Brunton et al 2017). More generally, reflecting and reporting on how the findings from qualitative evidence synthesis challenge, corroborate or develop theoretical frameworks contributes an important element of reflexivity (see section 3.8 below) helping to ensure that future reviews build upon existing knowledge cumulatively. Review authors can facilitate such cumulation by providing a summary of how theory has been used and which parts (if any) are validated through the findings of the review.

3.4.2 Selecting theories

While not all reviews involve the repeated iteration and development of a conceptual framework illustrated above, all review authors should recognise the value of having a clear conceptual framing at the start of the review (see also chapter 2). Definitions for all concepts, possibly identifying mid-range theory (or theories), can prove invaluable in determining the scope of the review and putting together an (initial) search strategy. Laying the ground at the outset is important in order for authors to identify which theories *might* be useful for their review. However, authors should not be too optimistic about being able to select an overarching mid-range theory that will 'work' for the entirety of a review. Systematic reviews are often based around a specific decision-making context (e.g. the identification of the most appropriate intervention to impact on a given outcome), with multiple approaches investigated in research studies – using different theoretical perspectives – to address the issue in question. Consequently, most reviews span multiple perspectives and cover many mid-range theories. Of course, a review team could plan a review to focus on a predefined theory and determine its scope accordingly, but commonly, a review starts with multiple candidate theories, which can inform the search and eligibility criteria, but only at the point of analysis do the most appropriate theories become clear. For example, in a systematic review on the influences of the uptake of information to prevent skin cancer, Garside and colleagues (2010) used the Health Belief Model as a "conceptual lens" to translate the themes and findings of included studies into one another. They found that, despite existing critique of the theory, as "a framework for synthesis… [the health belief model] provided a coherent framework to interpret and synthesize findings from most of the included studies" (p.163). The theory was selected pragmatically, at the initial stage of familiarisation with the included studies' findings and was based on this theory's prominence within four of those studies.

Conversely, flexibility may require a change in approach if a theory (or theories) selected at the start of the review subsequently prove to be less relevant. In the example of community engagement above, a pre-identified theoretical framework represented a poor 'fit' for many of the studies included. In response to this, both the theory and the analytical framework was changed. Please see Chapter 9 on framework synthesis for further discussion of this issue.

Questions to ask when selecting theories

In terms of selecting a theory, Noyes and colleagues (2015) *Guidance for review authors on choice and use of social theory in complex intervention reviews* offers some guidance to review teams seeking to select a theory. Drawing on Davidoff and colleagues' (2015) guidance they warn that not all theories are necessarily valid or relevant, and some may be inappropriate to the target context. The questions outlined in Box 2 (from Noyes and colleagues) might be helpful when considering the utility of competing theories in reviews of 'complex interventions' or where complexity is an important consideration.

Box 3.2: Questions to ask when selecting theories

- Is exploring complexity an important consideration? If so:
- Does the theory explain phenomena of interest? If yes, which phenomena?
- Does the theory contain unambiguous concepts that are understood by the team (external validity)?
- If selecting, adapting or developing a mid-range theory - are the relationships between and among the concepts clearly articulated?
- Where multiple theories are used, do the concepts translate across theories?
- Are the theoretical propositions empirically testable?
- Has the theory actually been verified by data or not?
- Are there published examples and evaluations of using the theory in a systematic review of a complex intervention?
- Is the theory originator contactable for advice and support?
- Does the review team have access to appropriate methodological expertise and support to optimally apply and use the theory?
- Are the concepts operationalised consistently by different coders (internal validity)?
- Does the theory promote comparison of results across studies?
- Does ease of use encourage over simplification, misapplication or abuse of already existing theories?
- Does the theory stimulate new theoretical development, if not then its usefulness is constrained? Will the review team discard the theory if it does not add value?

In addition, authors should consider the robustness of the theory:

- Does it explain the phenomenon of interest?
- Does the theory contain unambiguous concepts?
- Are the relationships between and among the concepts clearly articulated?
- Are the theoretical propositions empirically testable? (Ritzer 1991)
- Others (e.g. Merton) might add: has it *actually* been verified by data?

Clearly, not all questions are relevant for all reviews, but review teams may find it useful to select from the above questions so as to appraise individual theories in a systematic and transparent way. For further reading on the critical appraisal of theory, please refer to (Wacker 1998) which contains a detailed discussion of how specific features of theory (such as conservatism, generalizability, parsimony, consistency and abstraction) can be assessed and tailored to produce a 'good' theory.

3.5 Synthesising theories

Review authors cannot, or may not wish to depend on the pre-existence of a theory that they can 'take off the shelf'. They may need to specifically construct a conceptual framework for their reviews (see also chapter 9 on Framework Synthesis). Logic models

(chapter 4) are also widely used to bring together and represent the relationships between low level and mid-range theories that lie within the scope of a review.

Much less guidance exists for how to synthesise multiple mid-range theories for use in systematic reviews or primary research, or for synthesising theories from different disciplinary perspectives, such as sociology and psychology. One of the few papers to do this (Pound and Campbell 2015), sought to break the process of synthesis down into three stages: i) synthesis preparation, ii) synthesis, and iii) synthesis refinement. The process is necessarily iterative, with stage iii) potentially interacting with stage ii). In stage ii), the key principles involve identifying points where the concepts contained in the candidate theories 'translate' into one another, and where theories are in agreement and disagreement (see also chapter 11 on meta-ethnography, which follows a similar process for translating concepts or themes across the findings of included studies). This is similar to the 'constant comparative' process used in the example above on community engagement. However, the two differ in objective, with the community engagement review seeking to synthesise diverse theories in order to draw up a conceptual model of the varied perspectives; drawing together theories as was the case for the community engagement review may prove easier than a synthesis where the objective is to create new, abstract, mid-range theory.

The paucity of work on synthesising multiple mid-range theories might either indicate a research gap, or might suggest that the methods already developed are sufficient to answer review questions that address issues relevant to decision-makers. Thus, while synthesis of mid-range theory remains of academic interest, and may be a useful pre-cursor for the synthesis of other forms of literature; the role and value of a standalone synthesis of theory in evidence informed decision-making is less certain.

3.6 Equity, diversity and inclusion

Many QESs, especially those conducted within Campbell, seek to incorporate an equity lens into the design and conduct of the review. Health equity looks at avoidable and unfair differences in health and health outcomes. The Cochrane Campbell Equity Methods Group have developed low and mid-range theories of health equity for use by review authors (see Chapter 1 in this handbook, the Equity Methods Group website and Chapter 16 in Cochrane intervention handbook), which were used in the example above. Chapter 1 also signposts to other theories relevant to equity, diversity and inclusion can be used in reviews.

In addition to the PROGRESS-Plus checklist, theory can help systematic reviews consider equity through the use of mid-range theory. For example, Khaw and colleagues (Khaw et al 2022) synthesised mixed methods evidence on the experiences and perspectives of migrant and refugee women living in high income countries who used community doulas (trained people who can provide encompassing support throughout a woman's labour and birth); in order to consider questions around equity within the review, the authors drew on intersectionality as a framework (Crenshaw 1989) and considered how doulas could help marginalised women overcome different intersectional barriers to accessing healthcare. In this example, intersectionality is a form of middle range theory used by the reviewers to

consider how social identities and sociodemographic characteristics could add to layers of stigma that migrant and refugee women faced, which helped the reviewers consider equity issues within a review focussed on a marginalised group (Khaw et al 2022).

3.7 Stakeholder engagement and involvement

It is important that the theories selected are relevant and salient for all relevant stakeholders, and the selection of theory – and the articulation of the wider conceptual framework of the review – is often a critical point for engagement with all relevant stakeholders. Patients and the public who are expert by experience can advise, for example, on whether potential theories and their outcomes match with their lived experience. In the example above, the involvement of stakeholders and other academics was transformative in terms of how review authors engaged with the literature. However, it was the explicit articulation of the team's nascent framework that enabled stakeholders to engage with its thinking, challenging key assumptions, and forcing it to fundamentally reappraise its engagement with relevant theory.

3.8 Reflexivity

The review authors should be clear about their own theoretical perspectives and influences. For example, some reviews might utilise grand theory (e.g. feminist theory) as a lens through which to understand the research presented. Others might not identify a formal theory, but draw upon a body of work, such as the sociology of childhood. A meta narrative review (see Chapter 18) is founded on an overarching theory about the philosophy and sociology of science, where understanding the disciplinary perspectives of primary study authors is key to understanding diversity in study findings. (Greenhalgh et al 2005). For the above review on community engagement, the team reported an explicit reflection on its own theoretical biases, since simply defining community engagement involved making political and value judgements that not all readers would necessarily agree with. Thus, theoretical perspectives brought to the review by the authors might be explicit, implicit, or only uncovered during the process of doing the review. However, in each case, it is equally important for the team to be reflexive, and to consider the impact that their own biases may have.

3.9 Chapter information

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