

Systematic Reviewing in the Social Sciences: Outcomes and Explanation

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Liz Victor, University of Nottingham

lqxejv@nottingham.ac.uk

Abstract

There is growing interest in methods of systematic research review as a means to accumulate a solid evidence base to inform policymakers. This article examines three alternative methodological approaches to conducting a systematic review within the social sciences: the original evidence-based medicine approach; theory-driven approaches; and mixed methods. The discussion draws upon two existing examples of systematic reviews focused upon interventions to support unpaid, family carers and the implications for a proposed new review of carer interventions are considered. It is concluded that the apparent extremes of the evidence-based medicine approach and theory-driven approaches could potentially be combined together in a mixed methods review to optimise the insight gained.

Introduction

Methodological discussion and debate in sociology concentrates primarily upon the conduct of primary research. Yet, there is an awakening interest in methods used to review bodies of existing research, particularly in areas of work closely connected to policy. This area of work has been dismissed by some as second class academic work requiring little intellectual craftsmanship (see Oakley et al, 2005, p. 22). However, considerable, careful thought is required, not least in determining the precise methodology for a review. This is illustrated in this discussion of some of the alternative methods for systematic reviews emerging in the social sciences.

The original aim of a systematic review was to synthesise all the available, high quality evidence on the effects of an intervention to provide a robust evidence base to guide policy and practice. The method came to prominence with the development of the evidence-based medicine movement in the nineteen eighties and nineties (Evidence-Based Medicine Working Group, 1992; Sackett et al, 1996). This responded to the concern that medical interventions were not always based upon sound evidence of their beneficial effect. More recently in the UK, particularly since the election of New Labour in 1997, there has also been a wider drive for 'evidence-based policy and

practice' and consequently for the use of systematic reviews in other areas including education, social care and crime (Davies et al, 2000). As well as playing an important role in policy and service development, there are other good arguments for developing systematic reviews in the social sciences. Systematic reviews can: focus attention on the quality (or lack of quality) of existing research; help prevent duplication of research efforts; and provide additional insights through the comparison and/or combination of individual pieces of research. (Oakley et al, 2005).

However, questions have been raised about the specific systematic review methodology developed in the medical field and its appropriateness for use in the social sciences. Consequently there is a burgeoning literature which reports the development and use of diverse methods within recently conducted systematic reviews in the social sciences (see, for example, Annandale *et al*, 2007; Kleemans *et al*, 2007). As adapted and new methods are tried and tested apace, it is useful to pause for a moment and try to bring together some of the potential learning from this work. Some useful work towards this aim has begun. For example, particular approaches to the synthesis element of systematic reviews have been considered (Boaz *et al*, 2006) and key points of agreement and contention amongst systematic reviewers have been analysed (Pearson, 2007).

This article considers three categories of approach to systematic reviews. The first discussed is termed the 'evidence-based medicine' approach following Pearson (2007, p. 522). This is the very specific approach which emerged as dominant in the medical field where the ultimate aim is to synthesise data via meta-analysis. However, it is noted that often this methodology is adapted in the social sciences to respond to the difficulties of obtaining the controlled data required for meta-analysis. The second group of approaches termed 'theory-driven' here question the fundamental principles of the evidence-based medicine approach. They propose an alternative conceptualisation of 'what works' and consequently differing review procedures. The final approach considered is mixed methods which may potentially offer a way of combining the strengths of each of the former two approaches.

Contrasting approaches have generic advantages and disadvantages. However, as Boaz *et al* (2006) noted in respect of methods of synthesis, their suitability also depends very much upon the particular research questions that the reviewer seeks to address. This consideration of approaches has been undertaken to inform the development of a specific, proposed systematic review: '*Services and interventions for adult informal carers: What works and why?*'. Unpaid, family carers are the bedrock of policies to provide

community, rather than institutional, care for those who are ill or disabled. Yet, there is significant evidence of the difficulties that many carers face in this role (Stalker, 2003, p. 17). Thus, an evidence base is needed concerning what is effective support for carers and why (Hirst, 2005, p. 12). This systematic review aims to consider this within the context of the UK after the introduction of the 1990 NHS and Community Care Act. This legislation prioritised care within the community, rather than institutional care, for those with care needs and envisaged a significant role for family carers in achieving this. The conclusion of this paper considers the implications of the discussion for the methodology of this proposed systematic review.

Some systematic review work has been undertaken previously relating to specific types of carer interventions or services for particular groups of carers (including Harding & Higginson, 2003; Mason *et al.*, 2007; Pusey & Richards, 2001; Stoltz *et al.*, 2004; Yin *et al.*, 2002). This paper draws upon two of these reviews to illustrate some of the strengths and weaknesses of different approaches to reviewing. They are both examples of the first category of approach but there are some interesting differences between them. The first considered two types of intervention, individual and group-based, for carers of frail, elderly people (Yin *et al.*, 2002). The second examined different models of community-based respite care for frail, older people and their carers (Mason *et al.*, 2007). A summary of key characteristics of these reviews is given in Table 1 for reference throughout the subsequent discussion.

	Yin, Zhou, & Bashford, 2002	Mason et al, 2007
<u>Review focus</u>	Individual interventions and group-based interventions for carers of frail, elderly people.	Different models of community-based respite care for frail older people and their carers.
<u>Methods</u>		
<i>Study designs included</i>	Only controlled studies.	Randomised controlled trials prioritised, followed by quasi-experimental designs, followed by uncontrolled evidence.
<i>Synthesis method</i>	Statistical meta-analysis.	Statistical meta-analysis where sufficient, homogeneous data existed; and narrative analysis.
<i>Sub-group analysis</i>	Statistical moderator analysis used to explore heterogeneity in effects.	Differences between interventions, contexts and populations considered within narrative analysis.
<u>Findings</u>	Individual interventions had a positive effect and there was homogeneity in these effects. Group-based interventions had a smaller positive effect than individually-based interventions. There was heterogeneity in the effects of group-based interventions. The only significant variable identified to explain this was carer 'race'.	There was some evidence that respite for carers may have a small positive effect upon carer burden and carer mental or physical health. Carers were generally very satisfied with respite. Some groups of carers appeared to benefit more than others.
<u>Limitations</u>	The limited extent and quality of the included studies led the authors to conclude that further research is needed to produce more definitive conclusions. The review offers no explanation about how the interventions produce outcomes.	The poor quality of the included studies meant conclusions were tentative. It was difficult to make recommendations for policy and practice in the UK based on the primarily North American evidence. The review offers very little insight about how the interventions produce certain outcomes.

Table 1: Characteristics of two example reviews

In the Beginning... the Evidence-Based Medicine Approach

The development of statistical meta-analysis (the statistical interrogation of pooled data from multiple primary research studies) was one of the key stimuli for the growing interest in systematic reviews, particularly in the field of evidence-based medicine in the late eighties and early nineties (Petticrew & Roberts, 2006, p. 19). This technique offered the opportunity to generate more robust evidence through the use of larger samples about the effectiveness of interventions.

Guidelines for systematic reviewing note a series of steps to be undertaken prior to meta-analysis (Centre for Reviews and Dissemination, 2001). These include a comprehensive, unbiased search for all the existing evaluations of an intervention. The identified studies are then included in or excluded from the review according to a quality appraisal. Generally, as in Yin et al's 2002 review, only evidence from evaluations which include a control group that can be compared with the intervention group, is included. Comparison with the control group is used to identify that it is the intervention, rather than any other potential confounding factors, that is responsible for the identified effect. This provides the research with internal validity. Randomised controlled trials are preferred because the random allocation of participants to groups is the most robust way of making this comparison. However, studies with other types of control (quasi-experimental designs) may also be included in reviews. Of course, the value of any evidence depends upon whether the study has been well executed in itself as well as the overall research design. Data from studies identified to be of high quality in this way is then pooled and a statistical meta-analysis undertaken. Throughout the review process, the aim is that the methods used are transparent and replicable in order that the reliability and validity of the work can be judged by others.

The reliance upon controlled studies in this approach to systematic reviewing has the benefit of enabling the effects of interventions to be unequivocally identified. The control group which did not receive the intervention illustrates the counterfactual and thus provides clear evidence of whether the intervention made a difference or not. In Yin et al's 2002 review, the authors are therefore able to conclude that both group-based and individually-based interventions (considered separately within the review) for carers of frail elderly people have a more positive effect than no intervention. This evidence is important because it can be used to justify expenditure on interventions. The combination of a number of controlled studies through statistical meta-analysis enables more robust conclusions to be reached.

However, there are debates about the practicalities and ethics of using randomised controlled trials in the social sciences (Davies *et al*, 2000). For example, it may be considered unethical to withhold an intervention expected to deliver benefits from a control group of carers experiencing considerable difficulties. Key features of RCTs such as concealing group allocation from participants may also be impractical. Davies *et al* also note possible challenges to the epistemological validity of the RCT study design. For example, an aggregated effect measure may mask differential effects of the intervention on diverse service users. In a similar way some have challenged the use of meta-analysis arguing that this is invalid because it compares 'apples and oranges' (Petticrew & Roberts, 2006, p. 203). This accusation might be launched at Yin *et al*'s (2002) meta-analysis given that there was considerable variation between the interventions examined together, for example, in their duration. However, equally, there was also significant commonality such that it is reasonable to conduct a meta-analysis if the subject of interest is 'fruit' rather than specifically apples or oranges (Petticrew & Roberts, 2006, p. 203). Furthermore a number of methods have been developed to identify and to deal with heterogeneity within meta-analysis including the Q statistic, I^2 , sub-group analysis and meta-regression (Centre for Reviews and Dissemination, 2001, pp. 11-13; Petticrew & Roberts, 2006, pp. 217-225). Indeed, Yin *et al* (2002) identified heterogeneity in the effect sizes found by the different studies of group-based interventions. They therefore used moderator analysis to explore possible variables underlying this variation in effect size. This revealed that group-based interventions were significantly more effective for non-white caregivers.

However, there may have been some potentially relevant variables that were not considered in this analysis. For example, the specific approach of the staff delivering the interventions may have differed. This points to the extra level of difficulty and complexity in trying to understand the diverse and contingent social world through RCTs and meta-analysis. It is very difficult to take into account all the potential diversity within a socially-based intervention, the relevant population and the wider social context in meta-analysis. This is one of the key objections of those who advocate a theory-driven approach to systematic reviewing which is discussed later. These issues were also apparent in the Mason *et al* 2007 review of the outcomes for carers of respite-based interventions. Most of the controlled evaluations they identified were North American and none were undertaken in the UK (their focus of interest). There are likely to be commonalities in carer experiences in the two areas. However, after careful consideration the authors felt that relatively little could be learned from the North American findings in relation to the UK because of the differences in the context of the interventions such

as referral practice, service pathways and access issues (Mason *et al*, 2007, pp. 73-74). Thus differences in the context of interventions made it difficult to learn from this type of systematic review given the lack of controlled UK evidence.

Even where controlled evidence exists, its quality may be poor. Yin *et al* (2002) identified statistically significant intervention effects, but in their conclusion, they call their findings 'inconclusive' because of both the limited extent and quality of the controlled studies they found (2002, p. 207). Similarly, the review of respite services found that: "much of the existing literature fails to meet basic quality standards in terms of study design and analytical approach" (Mason *et al*, 2007, p. 77). In some areas of the respite review, no controlled evidence existed (of good or poor quality). The authors therefore also included some uncontrolled evidence as a starting point to cover gaps in knowledge. This is an approach taken more widely by systematic reviewers in the social sciences. However, caution about findings from uncontrolled studies is necessary given evidence of their bias compared to controlled studies (Deeks *et al*, 2003).

Where controlled data is not available for meta-analysis (or the data is too diverse to be analysed in this way), narrative analysis is generally used instead as in the respite review. The value of the narrative form of synthesis has been queried as possibly a step backwards towards a less structured approach more akin to the traditional literature review (Boaz *et al*, 2006). Yet, whilst narrative synthesis is essentially descriptive, the nature and findings of included studies are presented in a systematic, organised structure (often in tables), possibly by service or outcome. These findings are then drawn together in a series of overarching conclusions. Thus, this can still offer more than the traditional literature review.

The Challenge of Theory-Driven Approaches

A number of distinctive, theory-driven approaches have developed in recent years which fundamentally challenge the original systematic review methodology. Notably, there is the realist methodology of which Ray Pawson is the leading proponent (2006) and the critical interpretive synthesis developed by Mary Dixon-Woods and colleagues (2006). These approaches similarly present alternative understandings of how knowledge cumulates and thus develop alternative review procedures. However, Pawson focuses on knowledge concerning interventions (the focus here) whereas Dixon-Woods considers wider types of questions.

One of the main themes running through Pawson's arguments, briefly

mentioned previously, is that statistical meta-analysis and the experimental, controlled research studies upon which it is based cannot adequately consider the diverse, contingent and socially constructed nature of the social world. Pawson and colleagues (2004, p. v) argue that:

“the ‘same’ intervention never gets implemented identically and never has the same impact, because of differences in the context, setting, process, stakeholders and outcomes.”

Accordingly they find it misleading to classify interventions as either successful or not or to identify a ‘one-size-fits-all’ best approach to support. Instead, their aim for a systematic review is to explain the way interventions work. This is achieved through the development of theory which considers the different impact interventions might have according to variations between service users, forms of service delivery and other contextual factors. In other words, they understand ‘what works?’ as fundamentally being about ‘why?’ rather than there being two separate questions ‘what works?’ and ‘why?’. The question of whether this is a valid conceptualisation is returned to later, after the implications of this for the review process have been considered.

As such, this approach sees knowledge as being cumulated in a different way. This can be explained by making a distinction between reviews which are aggregative (data is added together to produce summaries) and their preferred approach which is interpretive (theory is built through the interpretation of data) (Dixon-Woods et al, 2006). From this conceptual base, alternative methodological procedures for systematic reviews are developed. The procedures set out by both the realists and critical interpretivists are very similar. The most notable difference is that Pawson views the process as primarily about testing and developing existing theory, whereas Dixon-Woods proposes a more inductive approach. Theory-driven review is presented as iterative: initial findings guide further searches and theory development in a cycle. Purposive sampling (as used within qualitative studies) is pursued such that studies of any type of design are selected on the basis of what they contribute to developing the theory further and sampling ends when theoretical saturation is reached. The methodological robustness of studies’ conclusions is also considered. However, generally the quality bar is set fairly low so that researchers can make selective use of the evidence according to its relevance and validity for their purpose, rather than on the basis of a standard data extraction template. Thus, compared to the original methodology, procedures are much less prescribed and the critical judgement of the researcher is much more significant.

A number of quite obvious methodological concerns could be raised about this approach. It appears to lose many of the features which were key

in the development of the systematic review methodology, in particular, comprehensive coverage and transparency. Nearly all would recognise that it is difficult for any systematic review to ensure absolute coverage of studies and elimination of the influence of the researchers' subjectivities. However, there are benefits to making efforts towards this end. For example, comprehensive searches may help to remove the bias arising when journals prefer to publish positive studies rather than those which show no effect or a negative impact. The identification of all relevant studies can also be a useful output in itself as the development of particular interest in the mapping stage of reviews evidences (Bate et al, 2007). Without a comprehensive search, it is also more difficult to consider whether the evidence used is necessarily the best quality data available for the purpose. Thus, certain benefits of systematic reviews are lost via the theory-driven approach. However, the question remains as to whether there are advantages that might in certain circumstances outweigh this.

A theory-driven approach could potentially be of great benefit for policy makers and practitioners because it could have a wider application than simply an evaluation of certain, specific current services. The explanatory theory could be used to inform the nature and form of a range of future services operating in different contexts. The review of respite-based interventions for carers would have looked entirely different if it had been conducted as a realist review and focused upon developing a theory around the use of respite services. This might have covered decision-making about the use of respite and explanations of why certain types of service are preferred. Suitable evidence is available. For example, it has been found that respite may not be used because the person who receives care refuses this type of provision (Twigg & Atkin, 1994, p. 128). Others show that the cultural sensitivity of respite provision may be important (Hepworth, 2005). Similarly, there is some interesting explanatory evidence that is relevant to the topics of the Yin et al review (2002). For example, Mitchell (1996) illustrated how the types of support provided to carers by support groups varied according to the way in which the groups were organised. Consideration of this type of evidence could have provided quite a useful output for policymakers and practitioners in terms of service development.

However, the theory-driven approach does not seek to identify a measure of effect which, whatever its limitations, may be viewed as key evidence by policymakers trying to decide how to allocate resources. In addition, by conceptualising 'what works?' as a matter of explanation, Pawson seems to imply that there is no need for outcomes measurements. In reality, the realist approach does implicitly draw upon 'what works?' because no explanation of why something works can be offered if it is not at least assumed to work in

the first place. However, the focus is primarily upon ‘why something works?’ rather than establishing whether it works in the first place. Whilst this approach may seem to have gone a step too far in this direction, it is worth remembering that reviewing has tended to be rather in thrall to the evidence-based medicine approach and its ‘black box’ view of interventions. Theory-driven approaches are useful in concentrating attention on critical issues around explanation and the diverse and contingent nature of the social world.

Mixed methods Approaches – the Best of Both Worlds?

The discussion so far has shown that whilst there are conceptual and methodological difficulties with both the evidence-based medicine and theory-driven approaches, each attempts to offer something distinct of value. It may therefore be appropriate to try and use both methods and further value could potentially be added by combining the insight provided by each approach. A number of reviewers have gone some way towards this and combined methods within a review (Oliver , 2005; Roberts et al, 2002). However, these approaches have generally taken the evidence-based medicine approach as the starting point and extended and adapted its use within the social sciences to answer wider questions than ‘what works?’ and to draw on a wider set of study designs. Thus they have been more concerned than those proposing theory-driven approaches to preserve, whilst adapting, some of the original elements of the systematic review methodology. It is consequently worth briefly noting some interesting methodological developments to this end before returning to questions about how review methods might be mixed.

Where reviewers have sought to include wider types of research evidence, particularly qualitative evidence, efforts have then been made to find appropriate ways to appraise the quality of this. A number of possible approaches have been developed (Spencer et al, 2003; Wallace et al 2003). There are also challenges in terms of how different types of data might be synthesised (for further detail, see Boaz et al, 2006; Pope et al, 2007). One approach that has been developed is meta-ethnography in which qualitative themes across pieces of research are analysed to identify concepts and themes which transcend individual datasets (Noblit & Hare, 1988). There have also been moves to include service users’ voices in reviews. Guidance from the Social Care Institute for Excellence states that these provide (Coren & Fisher, 2006, p. 3):

“(...) an additional and vital perspective on how problems are defined, what helps and what hinders the effectiveness of services, and whether a service is acceptable and accessible.”

Stakeholders and users can offer much insight into the processes of interventions and the explanations for success or failure required by theory-driven approaches. There are also power relationships involved in the production of and use of research by policymakers and there is a danger if service users are not included in reviews that their voices are stifled. The review of respite interventions included an expert reference group comprising of stakeholders and current or former carers (Mason et al, 2007, p. 89). They had an opportunity to put forward their views, although these outputs are not very prominent within the review report. This group raised important points such as a question about whether the outcome measures used in the included studies really captured the experiences of carers adequately.

Thus considerable, useful work is being undertaken to consider how evidence-based medicine systematic review procedures can be adapted for use with different types of data and questions. However, as suggested previously, the strongest approach to considering the effectiveness of interventions might combine both the original evidence-based medicine approach and a theory-driven type of approach in a mixed methods review. A particularly promising mixed methods approach which goes some way towards this has been developed at the EPPI Centre. This approach brings together both evidence on impact and data on users' views and intervention processes. The value of this has been evidenced in a series of three reviews which asked "what can we learn about promoting young people's health?" (Oliver et al, 2005). The first part of each review used meta-analysis and narrative synthesis to consider the effects of interventions. The second part of each review then consisted of a qualitative synthesis of the findings on young people's perspectives and experiences of mental health, physical activity and healthy eating. The two parts of each review were then brought together in a 'cross study' or 'matrical' synthesis which explored and interpreted the findings on the outcomes of interventions in the light of the themes identified in the qualitative analysis. This combination of methods produced further, useful insights.

This is not the only way of mixing review methods but it offers a useful, conceptually clear framework as a starting point for other developments. For example, other reviews might also find it useful to include qualitative, explanatory evidence from stakeholders other than potential service users. In addition, whilst this approach does seek to provide explanation, it also seems possible to go further towards this end through drawing more upon theory-driven approaches to reviewing.

Conclusions and Implications for the Proposed Review

The discussion has shown how the two 'extremes' of reviewing (evidence-based medicine and theory-driven approaches) stand in contrast to one another. The first is concerned with 'what works?' as measures of effect; the second focuses upon the underlying 'why' of 'what works?' and therefore generates explanatory theory. In terms of the proposed systematic review of the evidence about interventions for carers, both of these may be important to and useful in developing services and interventions.

The first could constitute evidence justifying funding for certain interventions. However, in practice, there is expected to be relatively little controlled evidence to contribute to this. A comprehensive map of the literature that does exist could be a useful tool in itself though for other researchers and policymakers. It could act as a signpost to existing research evidence and highlight where there is little or poor quality evidence. A theory-driven, explanatory approach is likely to be more feasible in terms of the availability of relevant evidence. It will also arguably contribute more in terms of informing the future development of carer interventions by offering theory and explanation about how these may work. Its focus upon the contingent, diverse nature of interventions and the social world will be particularly relevant given that carers' centres and services across the UK are generally independent organisations (often within networks) which operate in different ways and contexts. The aim will also be to undertake some form of mixed methods synthesis to bring the two strands of data together to gain further insight. However, this will only be achieved to the degree that the extent, nature and quality of the available evidence permits.

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