

Health and Social Care Professions
Education and Development Advisory
Group Research Sub-group

How to Conduct Research for Service Improvement: A Guidebook for Health and Social Care Professionals 2nd Edition

Edited by Michael Byrne



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive



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FOREWORD

It gives me great pleasure to introduce the second edition of this guidebook commissioned by the Health and Social Care Professions Education and Development Unit.

Research contributes to our health services in a multitude of ways, from clinical trials that validate new interventions to evaluations and audits of service quality. In doing so, research ensures that our services are clinically effective, cost-efficient and service user-centred. As indicated in the recent research activity survey, Health and Social Care Professionals represent a significant resource of skilled and motivated professionals who can advance the research capacity of our health service.

Building on the first edition, the current guidebook offers new and updated articles providing practical guidance on each stage of the research process, from the initial design through to publication. It is my hope that this guidebook will provide valuable advice and support to research active staff, while inspiring and motivating other staff to become research active.

This guidebook represents just one of a number of successes the HSCP Education and Development Unit has achieved in recent years. In particular, the annual HSCP research conference has been valuable in

bringing health service researchers together and showcasing the high quality research of our staff. I wish this group further success in supporting and developing the research capacity of our Health and Social Care Professionals.

The structure of our health service has recently undergone a number of significant changes including the development of our new directorate structures and the establishment of our Community Healthcare Organisations. Research will be needed to ensure that we provide an integrated continuum of care both within and across these structures. Our Health and Social Care Professionals, many of whom work at the interface of these structures, are well placed to lead on such research.

I thank all the contributors for their dedication in producing this high quality research guidebook and acknowledge the key role played by Dr. Michael Byrne as editor of this guidebook.



Tony O'Brien

Director General

Health Service Executive

EXECUTIVE SUMMARY

Conducting research is a complex process that involves many steps and a range of competencies (see Figure 1). The purpose of this second edition guidebook is to help our Health and Social Care Professionals (HSCPs) navigate these steps effectively. To this end, it boasts both updated and new contributions from esteemed researchers from various fields in health and social care who share their knowledge on a range of topics.

The reader is taken on a journey from the initial steps in research such as conducting a literature review, formulating appropriate research designs, applying for research funding; through to the ethical approval process, the analysis of both quantitative and qualitative data, and finally to the output and publication phase. Building on the first edition of our guidebook, the reader is also provided with guidance on how to critically analyse research literature; how to conduct mixed methods design, action research, and social network analysis; how to write an abstract; and is encouraged to embrace Open Access as an alternative to traditional subscription-based publishing. How research is applied to the 'real world' is also addressed in articles that examine organisational issues surrounding research and the conducting of service evaluations within health settings. As such, the reader is provided with a more comprehensive overview of the

process of conducting health-orientated research.

Building on recommendations from our second 2013 *Survey of the Research Activity, Skills and Training Needs of HSCPs in Ireland*, the guidebook aims to develop and enhance the research competencies of our HSCPs and to ultimately progress a research appreciative culture whereby research is prioritised and used to drive service innovation. In the long term, the aspiration is that national and regional research infrastructures will be established so that research activities of strategic priority within the health service can be driven. This is especially relevant in a time of limited resources.

We are highly appreciative of Minister Leo Varadkar launching this guidebook at our third annual HSCP research conference (April 16th 2015), as organised by our Research Sub-group of the HSCP Education and Development Advisory Group. Along with previous conferences, this includes inter-disciplinary practise-based workshops, and oral and poster presentations. We hope the work of our Research Sub-group will inspire our HSCPs to increase their research activity so that together we can drive evidenced-based practice and make real changes in the delivery of our health and social care services.

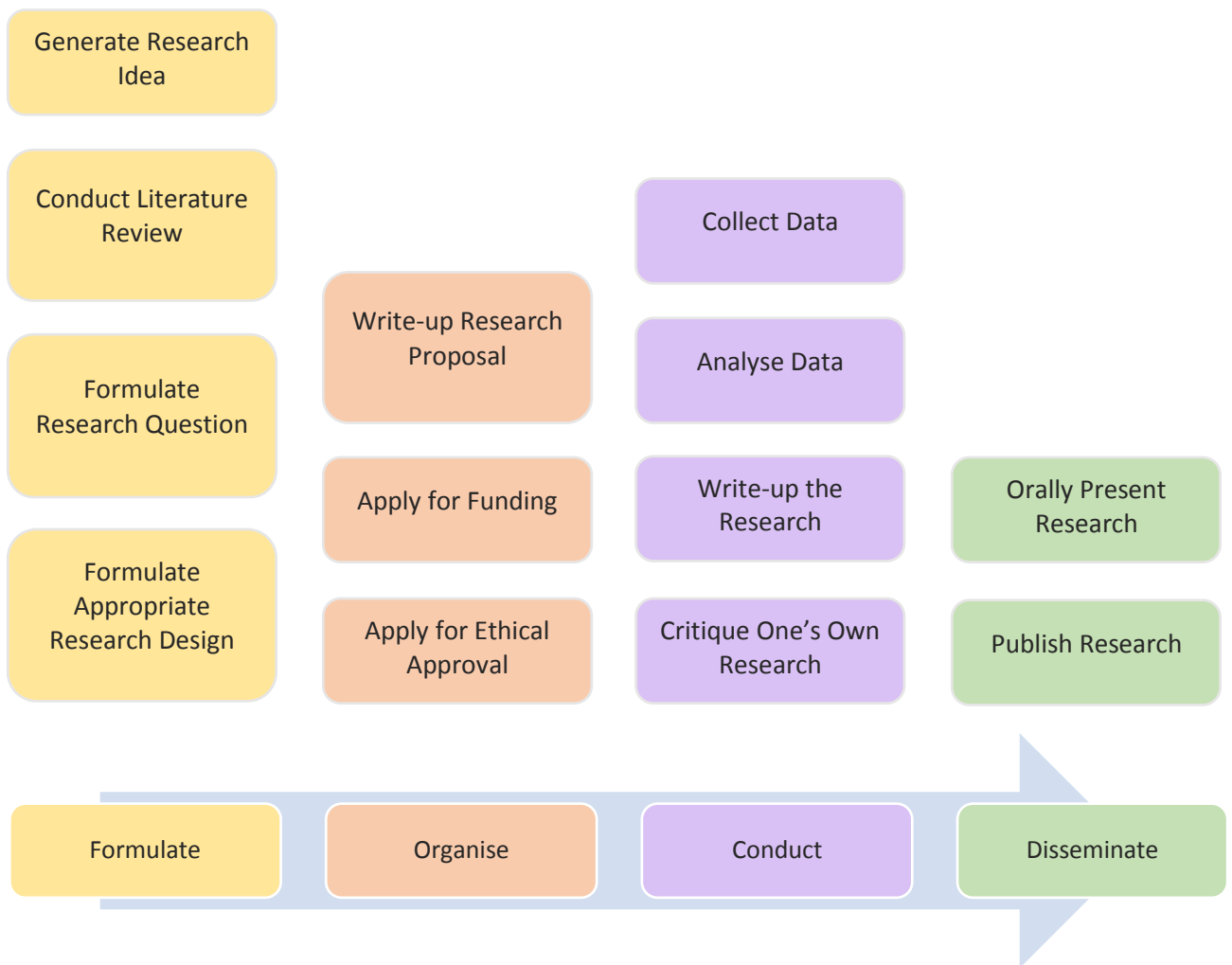


Figure 1. The steps involved in conducting research¹

¹ We wish to thank Patrick McHugh for producing this figure.

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HOW TO APPLY FOR RESEARCH FUNDING

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Introduction – why do research?

Research is essential to ensure that the services provided by health and social care professionals (HSCPs) are evidence based and cost effective. In a survey of research activity, skills and training needs of HSCPs in Ireland, respondents identified that one of the primary barriers to conducting research was a lack of skill and knowledge in the area of applying for research funding (McHugh & Byrne, 2011). The aim of this article is to provide some advice to assist HSCPs to secure research funding.

Choose your area of interest

The first step is to select your area of interest and to come up with some research ideas. This will ideally be dictated by the area you work in. HSCPs often have good clinical experience, and are well placed to identify good research ideas. Once you have selected your broad area, you should then refine your research question by reviewing the literature and finding out what is already known in the area. The key goal to your literature review is to identify a gap, which your research can fill.

Select and know your funding agency

Once you have decided on your research focus, then you need to select your funding agency. Your institution may have access to services

such as Research Professional, an online database of research funding opportunities, which can be used to search open calls and to create tailored funding alerts. A summary of research funding opportunities in Ireland was published in 2011 (Waldron & Byrne, 2011). The Health Research Board (www.hrb.ie) is the principal funder of health related research in Ireland. They focus particularly on population health science, patient oriented research and health services research. Their most recent strategic plan is for 2010-2014, and highlights priority areas of research (Health Research Board, 2009). The Department of Education and Science provides funding for health related research to the Higher Education Authority and to the Irish Research Council (<http://research.ie>). These bodies focus primarily on post graduate and post doctoral fellowships. Many Irish universities also offer research funding opportunities to support postgraduate research; information is available on university websites.

The Wellcome Trust funds research in the Republic of Ireland, under the auspices of the SFI-HRB-Wellcome Trust Biomedical Research Partnership (<http://www.wellcome.ac.uk>).

European health research funding is available as part of Horizon 2020 (<http://www.horizon2020.ie>), an EU research and innovation programme with a budget of nearly €80 billion over seven years. Enterprise Ireland provides coordination and travel support grants to facilitate participation in the Horizon 2020 Programme

(<http://www.horizon2020.ie/who-can-help/financial-assistance>).

Many registered charities are members of the Medical Research Charities Group (<http://www.mrcg.ie>) and are committed to supporting research in their specific areas. For example, the following organisations provide research funding: Irish Cancer Society (<http://www.cancer.ie/research>), Irish Heart Foundation (<http://www.irishheart.ie/iopen24/-t-1341.html>) and the Diabetes Ireland Research Alliance (<http://www.diabetesresearch.ie/iopen24>). If you are interested in conducting research in a particular disease area, you should check if there is ring-fenced money available through the relevant charity organisation. 'Genio' (<http://genio.ie>) funds research projects in the areas of disability and social inclusion.

A primary aim of the Health Research Board is to increase the number of clinicians and health professionals conducting research (Health Research Board, 2009). The Health Research Board acknowledges that health professionals working in the Health Services may have fewer opportunities for research training, less research support available and less time to engage in research than their counterparts working in universities. However, the Health Research Board believes that the engagement of health professionals in research is essential to strengthen the evidence base in health and social care. Therefore, the Health Research Board has a number of funding calls specifically targeting health professionals, such as HRB Clinician Scientist Award, Clinical Research Training Fellowships in Nursing and Midwifery, HRB-SFI Translational Research Awards and Research

Training Fellowships for Healthcare Professionals.

Regardless of where you are seeking funding, the key thing is to choose your funder carefully and to know exactly what they want. It's always a good idea to speak to somebody within the funding organisation to check that your project idea fits within their agency priorities and remit. Once you have decided on the funding agency, look at their website, or contact the funder, for details of past calls and to get an idea of when relevant funding streams tend to be announced. It's very easy to miss a deadline, or not to have enough time when a call is announced, so making a timetable of potential funding streams and likely deadlines can help structure your time. When the funding call is announced, it is critical to gather all the available information. Thoroughly read the application form, the application guidelines, FAQs, terms & conditions and any other relevant documentation. The importance of following instructions given by the funders cannot be overemphasised: if you ignore these, your application is likely to be rejected before it reaches the review process.

How are funding proposals reviewed?

Funding agencies differ in their review process, but usually applications will be sent to a number of peer reviewers with expertise in the area of research. Reviewers usually mark applications independently, using specific assessment criteria. They may then attend a review committee meeting, where applications are discussed and funding decisions finalised. With each funding call, assessment criteria are

specified. For example, a funding call may allocate 40% of the marks for the research proposal, 30% for the research team and 30% for the potential of the research to enhance health. You should find out the assessment criteria for your funding call and write your application with this in mind.

Some funding agencies ask for suggestions for reviewers for your application. Choose carefully; the reviewer should be someone you can rely on to engage with the review process and ideally you should suggest someone whose research you have cited in your application. Also, ensure that you provide their correct contact details.

What makes a successful funding proposal?

A good research idea is the first step to a good funding proposal. You need to convince the reviewers that your proposed research is important, novel and timely. Ideally your proposal should be creative and exciting. Your proposal should include a clear and realistic methodology, and the entire application should be well written and focused. When competition for funding is tight, it is often the presentation of the funding proposal which will determine which good research ideas get funded and which do not.

The visual impression of your funding proposal is very important. Clear headings and as much white space as possible make the proposal seem less dense and easier to read – remember, most reviewers will read your application on a computer screen so these measures greatly increase readability. Reviewers should be easily

able to find important sections of your application so organise your sections in a logical way with clear labels. If your research design is complex, it may be useful to create a diagram or graphic to represent the various steps.

You should write your proposal as if you are speaking to an 'informed stranger'. If you work in a highly specialist area, reviewers of your proposal may not be experts in your precise field. You should avoid unnecessary specialist terminology or jargon, and should clearly explain aspects of your proposal which may not be accessible to non-experts in your area.

Often, grant applications are organised under standard headings. These are usually:

1. Summary/abstract

This is the first section the reviewers will read, and sets the tone for the whole application. This section is often called a lay summary and should be simple enough to be understood by someone with no knowledge of the area while remaining convincing to an expert. The summary/abstract is usually the last section written and is worth spending time on. It should be clear, strong and detailed enough so that the reviewer has a good idea of what you're proposing from the outset. It should also convince the reviewers of the importance of your research and its potential application.

2. Background/literature review with references

This should be a structured critical review of the literature, logically organised to lead the reviewer to the gap(s) in the literature and your proposed research question. The

literature review should be comprehensive and include all significant research in the area with the most up-to-date references available. It is possible that experts in the area may be reviewing your application, therefore it is important not to miss critical references. If you have conducted previous relevant research, it is important to build this into your literature review and clearly outline how you are planning to develop this research. It is important to be balanced in your review; don't misrepresent literature in an attempt to sway the reviewer, as bias will be obvious to an informed reviewer. Make sure when listing your references that they are in the correct format and are accurately cited.

3. Statement of study aims and objectives

The study aim is a statement of what you want to achieve overall in your research. The objectives are specific steps to be taken to achieve your aim. Your aims and objectives should be clear, realistic and achievable. It is important that they fit together (i.e. your objectives really should achieve your aim) and logically follow on from the gap(s) in the literature you have identified. To allow the reviewers to understand the remainder of your proposal, this section is critical. Objectives or research goals as bulleted lists are much easier to digest than blocks of text.

4. Proposed methodology: including design, participants, data, procedures, and statistical techniques

This section is often the longest one in the proposal. The research methods you describe should relate directly to

your objectives. Ensure that you accurately describe the design of your research. Provide as much detail as possible about your participants: the population (e.g. all people with depression in Ireland); the sampling frame (all patients in general practice with a diagnosis of depression); the sample (a random sample of patients with a diagnosis of depression selected from a nationally representative sample of general practices). You should provide detail about your sample characteristics, including sample size and how this has been calculated. Participant exclusion and inclusion criteria should be specified and justified.

Pre-empt challenges and difficulties which you are likely to encounter in your research. This reassures reviewers that you are realistic and prepared to deal with setbacks. If you have a particularly hard-to-access population, successfully completing a pilot study of participant recruitment will assuage reviewer concerns that your project is untenable. Describe in detail what data you plan to collect (with references for standardised measures) and what interventions or procedures you plan to use. Again, indicating alternatives and justifying your selection show that you are informed and have given some thought to your decisions. A general rule of thumb for this section is to identify the potential pitfalls before the reviewer can!

One of the most common flaws in funding proposals is that the applicants do not seek statistical advice to write the application. Many research proposals should have a statistician or qualitative expert as a core member of the research team.

Many universities now have a Research Support Centres (for example the HRB funded Clinical Research Facility at NUI, Galway), where you can get advice on accessing statistical support. Your research proposal should include a detailed plan for data analysis.

5. Study team (usually principal investigator, co-applicants and collaborators)

A funding proposal always has a principal investigator, who leads the application and takes ultimate responsibility for the application and, if funded, the research project. Usually, a proposal will also have co-applicants, who are core members of the study team and who will support the principal investigator in writing the application and conducting the research. Often, a proposal will also have collaborators, who are more marginally involved in the research, and who bring a specific set of skills which can assist the research team. You are likely to be asked to describe your plan for project management and governance. The principal investigator always has ultimate responsibility for the research, and can be supported by other team members through a project management committee, a study steering committee and a scientific advisory committee. Check with your funding agency to see if they have requirements about committees and their constitution. You are also required to indicate what proportion of time each applicant will be able to devote to the project (e.g. a co-applicant may promise to commit 2.5% of their time to the project, whereas a principal investigator may be expected to commit 5%). Time commitments indicated should be

realistic in light of other work and responsibilities.

As a principal investigator you need to establish your credibility and convince reviewers that you have the skills to deliver the project on time. Your track record, including clinical experience and publications, and previous experience of attracting funding should be outlined clearly. You will also need to identify what additional expertise is required to successfully conduct your research and demonstrate that your research team can provide what is needed. You need to convince reviewers that you and your collaborators are qualified to conduct the research, by explicitly detailing all *relevant* expertise and skills within the research team (be selective, don't just list *all* their skills and experience, otherwise the relevant bits get lost in a sea of information). Remember, you may consider it obvious that your research team is excellent and the best people for the job, but you need to persuade the reviewers by providing concrete examples of their appropriateness and the complementarity of their skills. If you and your collaborators have already published research in a particular area, you are much more likely to be successful in obtaining research funding in the same area. Often, collaborators need to sign an agreement form, so find out well in advance if this is the case to ensure all forms are ready when submitting your application.

The Health Research Board and other funding bodies are becoming increasingly concerned that research findings can be successfully translated into practice; therefore it is advisable to involve key stakeholders including

practitioners and policy makers in your funding proposal. If possible, you should invite such people to join your study steering committee. A letter of support from key stakeholders to include with your application is often a strong indicator that you are capable of engaging with the relevant parties to ensure the results of your research will be put to good use. Working with patients and the public in the development of your funding proposal is also important with many application forms now including a section on public involvement in the research project. INVOLVE, a research advisory group for public involvement in research, offers useful resources (<http://www.invo.org.uk>).

6. Potential benefits and applications of your research

In this section you need to convince the reviewer that the output from your research is likely to further the mission of the funding organisation. You also need to show that your research is likely to have a tangible impact. For example, if you are testing an intervention for improving educational outcomes among children with learning disabilities, you need to be able to show that the findings from your research will actually have the potential to impact on practice in this area. Also, make your research as pragmatic as is scientifically possible, for example, the inclusion of a cost effectiveness analysis in your research can greatly enhance the chances of a successful intervention being adopted into practice. To guarantee that your research will impact on practice, you need to develop a plan for disseminating research findings to service providers and communities.

For academic outputs, be as specific as possible and outline draft paper titles, target journals and conference details. Don't worry that plans might change a little if the project is funded, being detailed in your application will help convince reviewers you are aware of key journals and conferences in your area. There is also a requirement to increase public access to your research by publishing in open access journals and depositing publications in an open access repository. The Health Research Board published a new open access policy for research publication arising from funded research in May 2014 (<http://www.hrb.ie/research-strategy-funding/policies-and-guidelines/policies/open-access>).

7. Budget

Researchers often find the budget a challenging aspect of a funding application. It is worth trying to get support from an experienced research funding applicant or a research accountant (most universities have research accountants working in their research offices) to complete this section if possible. The funders are likely to provide detailed instructions on this section (e.g. salary scales to be used, guidelines on inclusion of pension and related salary costs) and these should be followed exactly. Budgets often include the following sections: salary and related costs; student fees and stipends; research equipment; consumables (e.g. paper, phone costs, printing questionnaires); and travel and dissemination (including research related travel and travel to conferences/events to disseminate research findings). You should think of all the possible costs to your project and ensure they are included in the budget. It is important to find out how much of an overhead your

organisation will take from your budget: universities will commonly take around 30%, but health services usually require less. All costs need to be justified, so be clear about why you are asking for a specific amount (for example, if you are budgeting for a post-doctoral researcher, you need to justify why a researcher is required at this level, and why a less qualified person would not be suitable for the job).

An example of a research funding proposal budget can be seen in Figure 1. In this study, the applicant was proposing that a post doctoral

researcher and a PhD student would be employed to conduct the research.

8. Gantt chart

The Gantt chart is a diagrammatic representation of your research work plan. Remember to include all steps on the Gantt chart, such as applying for research ethical approval and recruiting research personnel. It's also a good idea to map key outputs into the Gantt chart, as an output focused application is reassuring for reviewers. An example of a Gantt chart for inclusion in a funding proposal can be seen in Figure 2.

Table 1: An example of a budget within a research funding proposal

	year 1	year 2	year 3	Total
Salary				
Post doctoral researcher, point 1, Post doctorate researcher scale, as per IUA	37,750.00	37,750.00	37,750.00	113250
Employers PRSI				
Research associate PRSI	4058	4058	4058	12174
Employers Pension contribution	0	0	0	0
Research associate pension	0	0	0	0
Student stipend				
PhD student	16000	16000	16000	48000
Student Fees				
PhD student (Faculty of Arts, 2008/2009 rates)	4275	4275	4275	12825
Running costs – Consumables				
2 x Dell Latitude E641 laptops at E740 each plus 21% VAT	1790	0	0	1790
School letters (stationery, postage, photocopying etc)	1000	0	0	1000
Parent questionnaire postage and reminders	2000	0	0	2000
Telephone costs	500	500	500	1500
Printing questionnaires/Full report	2500	0	1750	4250
Costs associated with pilot intervention, including data collection tools	0	0	9000	9000
Running costs – travel				
Project related travel	2000	1000	1000	4000
Study steering group meetings (travel, room hire)	2300	1000	1000	4300
Travel/expenses reimbursement for stakeholders participating in intervention development meetings	0	0	1000	1000
Running costs - Other				
Statistical consultancy fees	2000	2000	2000	6000
Administrative support	2000	2000	2000	6000
Dissemination Costs				
Dissemination meetings nationally	0	1000	1000	2000
Conference (3 Irish/1 European)	800	800	3000	4600
Total before overhead	78973	70383	84333	233689
Total before overhead minus student fees	72908	66108	80058	219074
Overhead at 30% of total (minus student fees and equipment)	21872.40	19832.40	24017.40	65722.20
Overall total with overhead	100845.4	90215.4	108350.4	299411.20

Table 2: An example of a Gantt chart mapping the timeframe of a proposed study within a research funding proposal.

	Month											
Project set up	1	2	3	4	5	6	7	8	9	10	11	12
Recruit research associate												
Recruit PhD student												
YEAR 1	1	2	3	4	5	6	7	8	9	10	11	12
Phase 1: PhD literature review and data collection preparation												
Research ethical application												
Prepare and pilot data collection materials												
Recruit and prepare schools for data collection												
Administer student and parent surveys												
School assessment: structured interviews with school principals and assessment of school infrastructure												
YEAR 2	1	2	3	4	5	6	7	8	9	10	11	12
Objective physical environment data collection (PhD student data collection)												
Data analysis from phase 1												
Phase 2: Intervention development & piloting												
YEAR 3	1	2	3	4	5	6	7	8	9	10	11	12
Phase 2: Intervention development & piloting (cont'd)												
PhD write-up												
Report preparation and study finding dissemination to key stakeholders												

Key outputs by end of year:	
Year 1	<ul style="list-style-type: none"> University Research Ethics Committee Approval.
Year 2	<ul style="list-style-type: none"> Publication in peer reviewed journal of findings from Phase 1. Findings from Phase 1 presented at international and national conferences. Publication of international comparisons from Phase 1 (with Australian comparison data).
Year 3	<ul style="list-style-type: none"> Following phase 2, a study report will be published specifying recommendations for policy development in this area, targeted at stakeholders in policy and practice. Application for financial support for full-scale implementation of the intervention in a controlled trial. PhD completed, and resulting papers for publication in peer reviewed journals.

Using theory in your funding proposal

Even if you are not explicitly stating a theoretical framework in your research plan, you have an implicit theory which is guiding the way you design and plan your research proposal (Herek, 2011). Your proposal will be stronger if you explicitly state your theory, and show how you are planning to measure the various constructs within the theory. This way, you will not only find out *if* something works, but you will be able to say something about *how* it works. Importantly if something doesn't work as intended, theory can be used to explore why and to suggest future research. Using theory in developing interventions is good scientific practice, as it shows you are not reinventing the wheel and it also allows findings to progress scientific knowledge in an area which can be generalised to other situations.

Make sure your research proposal is ethical

You should show an awareness of ethical issues in your proposal and address any potentially ethically challenging issues which may arise. These may include issues such as data confidentiality or participant consent. You should clearly outline how you plan to address these, as well as giving details about how you will obtain ethical approval for your research.

The 'Data protection Guidelines on research in the Health sector' produced by the Data Commissioner of Ireland in 2007 (<http://dataprotection.ie>) should be consulted and referred to as the definitive guide to addressing ethical issues in relation to management of

patient data in health services research.

Adding the finishing touches...

Make sure you have plenty of time before the submission deadline to review your application. Ideally, you should give your proposal to three people to read: (1) Someone with specialist knowledge in your research area, to check accuracy; (2) Someone without specialist knowledge in your research area, to check clarity; (3) Someone to proof read the whole application for spelling mistakes and grammatical errors. This person should also be able to advise on readability, clarity and layout.

If your organisation has a research officer, they may be willing to read your final application (indeed, they usually have to sign off on each application), and advise you on fine tuning your application. This person will be ideally placed to help you write the section on research supports within your organisation. Make yourself aware of any internal deadlines and get all the necessary signatures from people within your organisation in plenty of time for submission before the deadline (usually applications should be signed by an Institutional Research Officer and a Research Accountant).

Getting started...

If you have relatively little experience of research or applying for research funding, it is likely that the process sounds daunting. If you are a novice, the best thing you can do is to find a more experienced researcher working in your area and ask them to act as your research mentor. Ask your mentor (and others if you can) for copies of successful and unsuccessful

grant applications which they have previously submitted. This is extremely useful in getting ideas about what makes a successful application.

A great first step is to be a collaborator on a research funding application. You are likely to have some unique skill or contribution to make to your mentor's research (for example, providing access to a client group or sharing ideas about potential interventions to be tested). By this process, you will have the opportunity to be part of a research team and take part in the process of applying for research funding, without the responsibilities associated with being a principal applicant. This way you can build your skills, experience and confidence. Remember, very few researchers have all the skills required to complete a research project alone, so collaboration is key. You could also find out if there are early career awards or scholarships available – these are designed to support inexperienced researchers to build their expertise.

If you fail, then try again...

Competition for research funding can be stiff and, therefore, failure common. The Health Research Board, for example, funds an average of 25% of the funding applications they receive. For some funding calls, the proportion of funded applications is even lower. Usually, when a funding application has been unsuccessful (a gentler word than a failure!), the applicants will receive feedback from the reviewers. This feedback is precious - it allows you to assess just how close you were to success. If the feedback is damning, you may choose to park your research idea and move

in another research direction. However, more usually, the reviews will be mixed, containing some praise and some concerns. You may choose to address some of the concerns and rewrite your funding proposal to submit to the next similar funding call, or to an alternative funding call. If you are resubmitting to the same funding agency, it is a great idea to outline the feedback which you have received and show how you have addressed these concerns in the revised application. Research funders love when their advice is taken on board. This process is likely to actually improve the quality of the research when you are (hopefully and finally) successful.

Conclusion

In summary, research is essential to provide a strong evidence base for health and social services. Services which are evidence based are more likely to be funded in times of retracting health spending. There is currently a move towards encouraging health and social care professionals to engage in research, and there are several targeted research funds available to support them. Grantsmanship involves several skills, all of which can be learned. Successful funding applications are written by strong research teams and ask important, novel research questions, which can be answered by the proposed research methodology. Grantsmanship is all about revising and re-revising your application to make it clearly written, focused, easy to read and understand, persuasive and accurate. The steps involved in applying for research funding are summarised in Figure 3.



Figure 1: How to apply for research funding²

² We wish to thank Conal Twomey (former Research Assistant, Roscommon Health Service Area, HSE West) for producing this figure.

Recommended reading:

Document on the Health Research Board website 'Preparing a good grant application':

<http://www.hrb.ie/research-strategy-funding/how-to-apply/preparing-a-good-grant-application>

Guidelines on the UCC Research Support Service website 'How to write a successful proposal':

http://www.ucc.ie/en/research/funding/apply/successful_proposal

Crombie, I. K., & Du Ve Florey, C. (1998). *The pocket guide to grant applications*. London: BMJ Books.

Pequegnat, W., Stover, E., & Boyce, C. A. (2011). *How to Write a Successful Research Grant Application: A Guide for Social and Behavioral Scientists* (2nd edition). London: Springer.

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HOW TO MATCH RESEARCH DESIGNS TO ORGANISATIONAL ISSUES IN HEALTH AND SOCIAL CARE

MANDY S. LEE

Introduction

In an era of evidence-based healthcare, health and social care professionals are increasingly required to rely on robust evidence to inform their decision-making, not only regarding their clinical practice, but also in the organisation and delivery of their services. While the generation and use of clinical evidence has long been part of the work of healthcare professionals, clinical practitioners are often not as familiar with the use of organisational research evidence as compared with the use of clinical evidence (Vella et al., 2000), or with conducting research themselves to address service priorities (McHugh & Byrne, 2011). This article aims to help professionals identify the most appropriate research designs in tackling different types of organisational issues in health and social care.

For healthcare decisions to be based on sound evidence, we need to first understand the criteria upon which the robustness of evidence is determined. It has long been recognised by healthcare researchers from a variety of disciplines (Faulkner & Thomas, 2002; Glasziou et al., 2004; Littlejohns & Chalkidou, 2006), that the 'hierarchy

of evidence' used in distinguishing the quality of clinical evidence under the standard model of 'evidence-based medicine' cannot be unreflexively applied in dealing with organisational issues in health and social care.

Indeed, over the past two decades healthcare scholars have increasingly raised our awareness regarding the danger of unexamined assumptions when we import one model of research into a different field of inquiry, warning researchers of the peril in ignoring the complex social-embeddedness of healthcare in our aim to achieve evidence-based policy and practice (Gambrill, 2006; Lambert et al., 2006). Rather than assuming that evidence can be hierarchically ranked according to their robustness of design and execution when addressing the huge diversity of research questions relevant to setting health service priorities, researchers have argued instead for a *typology* of evidence that determines the quality of different types of evidence in answering particular kinds of research questions (Grypdonck, 2006; Petticrew & Roberts, 2003).

Matching Research Designs to Research Problems

If we are to embrace the issues of health service delivery and organisation as falling under the broader remit of "evidence-informed healthcare", then our research objectives go beyond simply determining the efficacy of a clinical intervention (for which evidence from randomised control trials [RCTs] remain the gold standard), to incorporating such myriad aims as needs analysis, service development, organisational change and stakeholder engagement. Each of these research objectives requires the generation of

robust evidence that cannot be, nor appropriate to be, fulfilled by RCTs.

This is especially true when it comes to questions concerning the management and organisation of health and social care services, which encompasses a wide variety of research problems. The ways these research problems are defined and specified represent the first starting point towards designing investigations that can generate robust data in answer to the study aims.

Health services and healthcare management research are concerned not only with macro levels of analysis (e.g. the performance of the health system as a whole), but also at the meso (organisation or service) and the micro (team or individual) levels, depending on the specific aims of a study. No single study, however well-resourced, can answer all the questions arising from a particular organisational issue. Therefore as a very first step, one must be very clear about the scope of a problem to be tackled in a research project and the applicable level of analysis. It goes without saying that a clearly delimited research study with unambiguous terms of references about the issue domain as well as level(s) of analysis will generate much more robust evidence than a study with poorly defined aims and parameters.

Research rigour for these broader questions addressed by health services and healthcare management research is defined not so much by the type of evidence that a study generates, but by the *degree of fitness* between the research objectives and the methodological approach chosen. Indeed, if we were to examine each component of a research design, from research objectives and questions

to research outputs (data) and outcomes (implications of findings as regards health and social gains arising from service improvements), then we can see that each of these need to be carefully matched in order for a coherent research plan to be developed. Figure 1 provides a graphical overview of the levels of consideration we need to apply in determining the robustness of a particular research design in health services research. For a given research design to be considered fit for purpose, there must be logical linkages between its components at each level of formulation of the research project, so that the means chosen are appropriate to the specified ends.

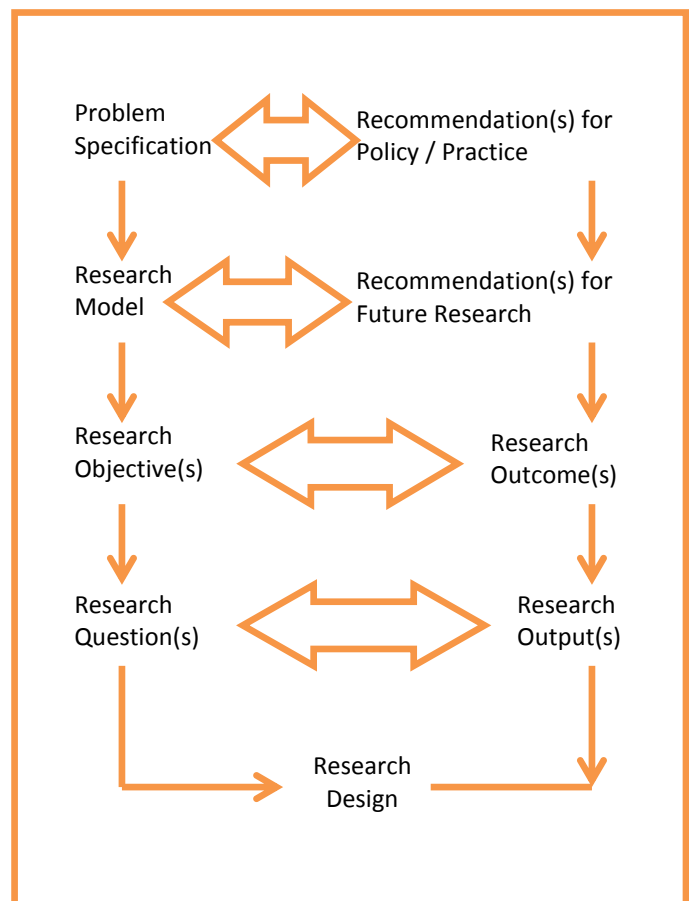


Figure 1. Ensuring rigour in matching research designs to research problems.

At the most basic level, the way a research problem is defined must align with the nature of policy or practice that the research is expected to contribute towards. This is not to say that a researcher makes an *a priori* judgement on policy recommendations; rather, the researcher needs to ensure the way the research problem is framed actually matches up with policy or practice goals. It would neither be helpful nor appropriate, for instance, to generate evidence on staff retention in a service experiencing high staff turnover, if the problem is actually framed as one of staff recruitment. Whilst recruitment and retention may well be inter-linked problems, or different aspects of the same problem (e.g. inadequate staffing levels); they are not the same, and investigating recruitment issues when one is hoping to resolve retention problems would mean that the generated evidence will be of little use given the overall goal of the research, no matter what research design is chosen and how competently the study was executed.

When we have correctly identified the substantive aspects of a problem to be addressed by research through setting clear terms of reference, we must then be careful in determining the kind of research attention that would be most appropriate to address the problem, so as not to confuse, for instance, a retention issue that warrants exploration (e.g. why do people choose to leave the service?), versus one that requires description (e.g. how many people are actually leaving, which categories of staff are experiencing high turnover and at what rate compared to others?), or indeed one that demands evaluation (e.g. to what extent is high staff turnover impacting on service

provision, does a newly-developed staff retention initiative actually help to reduce staff turnover?, etc.). The particular research model –descriptive, exploratory, evaluative, etc. – that we adopt for a particular study should be determined first and foremost by the nature of the problem we are hoping to address, and secondarily by the time and resource constraints of a specific project. Figure 2 below illustrates the five key research models that are relevant to health services researchers and their associated research questions.

Knowing the research model we are going to employ for a particular study helps us to relate our findings to the extant scholarship, which in turn helps us to identify gaps in the literature for further investigation. In a topic area where previous researchers have already established robust evidence relating to the nature, extent, and causes of a problem, it would be more useful for new investigators to conduct research focusing on service development, such as evaluating new interventions designed to tackle various aspects of the problem, or exploring ways of implementing interventions already found to be helpful in some settings in resolving the problem. On the other hand, when a new phenomenon arises such that there is only anecdotal evidence but no systematic knowledge about it, it would be a more fruitful use of resources to establish the nature and extent of the phenomenon through exploratory or descriptive research, before trying to test interventions to address an issue that is little understood, or may in any event turn out to be a transient or a local issue.

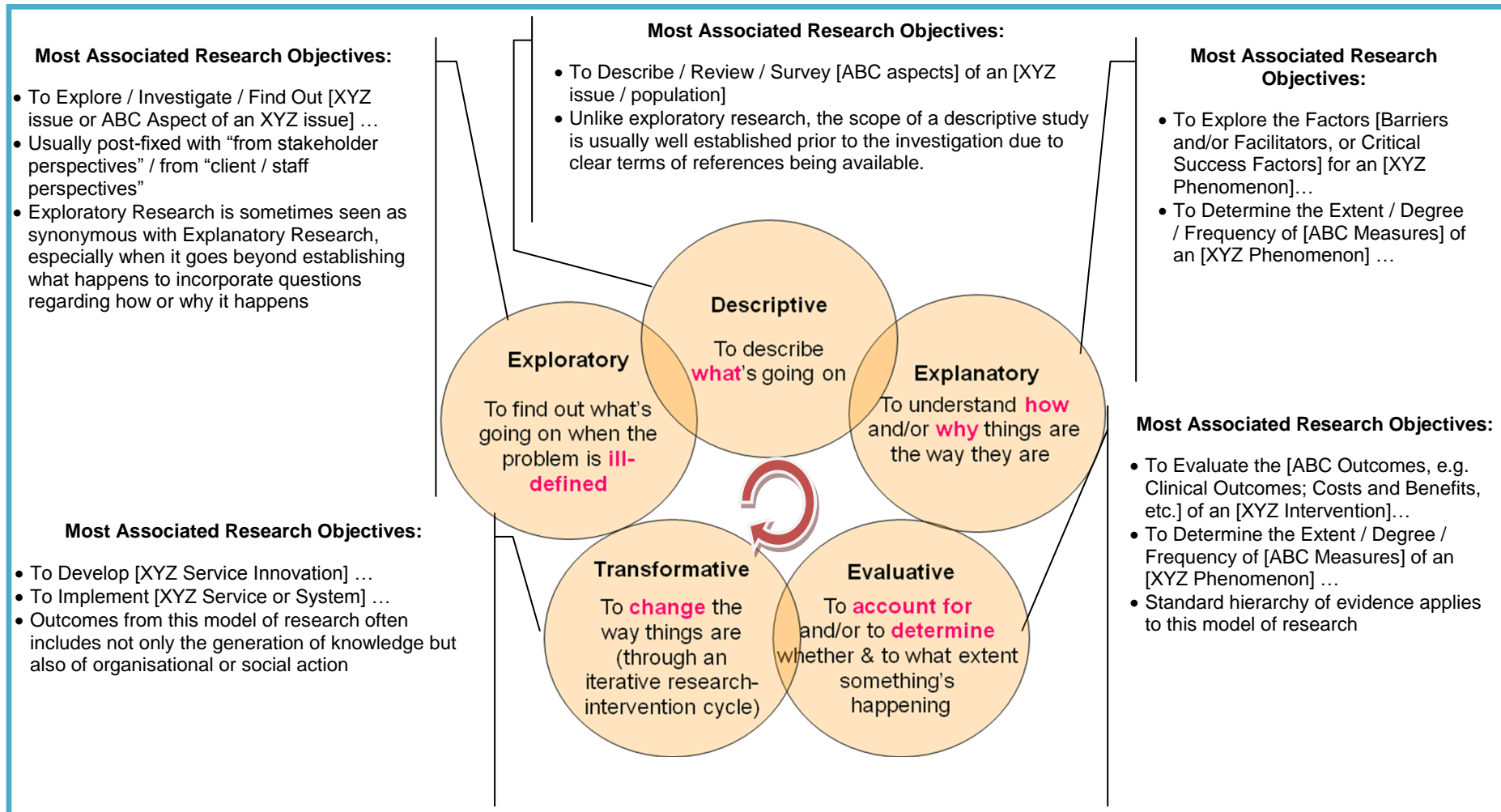


Figure 2. Different research models, what they aim to achieve, and their most associated research objectives.

On a nascent topic on which very little is known, a lot of exploratory research will need to be conducted to determine the nature and the extent of the problem. Here, qualitative methods may be the most appropriate because of the importance of understanding the issue from the perspectives of those who have first-hand experiences of it. At this early stage, quantitative measures may be of relatively little help unless the phenomenon is inherently quantitative in nature, as we do not yet have enough understanding of a problem to specify operational definitions that would lead to adequate measurements of the issue. We need inductive research that would allow us to get a sense of what might be considered appropriate definitions of the phenomenon, before valid indicators can be developed to measure the phenomenon with. At this early stage of the research cycle, the key research output would be to arrive at valid operational definitions from which valid indicators can be derived. Without attending to this crucial step of inductive exploration, the numbers we might obtain from conducting quantitative research on a problem may mislead rather than enlighten.

Once the broad parameters of a phenomenon are known, we can proceed with more systematic descriptive and explanatory research that sought to specify the extent to which a problem manifests itself, and to explore the causes that underpin it. Here, both qualitative and quantitative research play crucial roles, and the choice of methodology often depends on the level of analysis desired (i.e. the higher the level of analysis, the more quantitative the research design becomes in order to allow for objective comparisons; while lower levels of

analysis often requires interpretive understanding to include contextual information relating to the particular team or organisation).

When there is a corpus of evidence on the nature, extent, and factors relating to a research topic, the ground is ripe for evaluative research that examines the efficacy of interventions designed to tackle various aspects of the problem. This is the standard research question of 'What works?' or "Does treatment A works better than B?" In answering such questions the standard hierarchy of evidence applies and experimental research that could objectively and unambiguously isolate the cause-effect links are extremely valuable in providing evidence-based recommendations for population-level interventions. National guidelines can be more validly established via systemic reviews of such robust evaluative evidence, whether we are concerned with clinical or non-clinical outcomes (e.g. social gains).

However, evaluation is not the end of the applied research cycle, especially when it comes to human, as opposed to mechanical, organisations. The question that naturally follows 'What works?' is 'How do we implement?' The recent rise of 'Implementation Science' is testament to the importance of this 'How to' question in health and social care, which is often best addressed through action-oriented research methodologies, allowing organisational members to engage in an iterative cycle of action and reflection, not only to ensure that the intervention is adapted to local needs, but also to engender local ownership in the framing of the problem as well as in arriving at a solution collaboratively, in a process

that respects the innate agency of organisational members in resolving problems locally, rather than as mere automatons that simply replicated solutions handed down from on high.

As can be surmised from the above discussion, sample size on its own is a very poor indicator of the robustness of a study, even though it is often perceived as a key factor in determining research rigour. For research that tries to address questions relating to service development or problem specification, and indeed issues of organisational change, it may be far more appropriate to adopt small sample qualitative research to investigate in depth the perceptions and experiences of various stakeholders, which will give a more rounded view of the issue at hand than a large survey based purely on indicators that researchers felt might be useful, but which might have simply reified the dominant group's perspective on the phenomenon. In the latter case, even a survey with a large sample seldom yields valid results, and at best may yield only superficial evidence, due to the lack of genuine research engagement with different stakeholder groups that allows people beliefs and experiences to be explored, and their voices in relating their first-hand experiences in their own words, to be properly heard.

Specifying research objectives that clearly outline the content and nature of the issue to be investigated is thus the first and most crucial step in the design of a research study. It is through research objectives that we delimit the scope of a research project. As shown in Figure 2, research objectives are best defined by using verbs that are clearly linked to a

specific research model (e.g. 'to explore', 'to evaluate', 'to describe', 'to develop', etc.). Each specific aspect of the issue covered in an investigation needs to be identified as a distinct research objective; and each research objective should be associated with at least one specific research question.

Determining Research Questions for Organisational Studies in Health and Social Care

We have seen how different research models are intimately linked to specific kinds of research objectives, which are in turn associated with specific kinds of research questions. Accepting the fact that different kinds of questions exist in health and social care research is key to appreciating the reason we cannot rely simply on a predefined hierarchy in determining the robustness of research evidence. While randomised control trials are the 'gold standard' for answering questions of the 'Does it work?' variety, it is often unsuited to answering the 'How?' questions, especially for phenomena that have already happened in the field as opposed to those that can be experimentally-controlled³

The type of research questions we ask also has a direct bearing on the type of research outputs – i.e. actual data – to be generated from a study. For

³ Antonakis et al. (2010) have also provided a thorough discussion as to the precise conditions under which it would be appropriate to use experimental methods to arrive at causal explanations for a phenomenon. The problem, as they see it, is that researchers are often careless about applying quasi-experimental reasoning for causal explanations, when such explanations are not actually warranted given the way field conditions might have violated key design assumptions.

instance, the 'why' question at the micro and meso levels often engenders *understanding* as a research output, encompassing contextual and subjective information in addition to objective data about the phenomenon (e.g. understanding why individuals leave their posts requires experiential information from departing staff as well as trend data on staff turnover). Answering the 'why' question, on the other hand, will not help us estimate the extent of a problem, nor indeed potential solutions to a problem, which requires answers to 'What' (e.g. what categories of staff are experiencing high turnover, what is the attribution rate of the whole service in general and in specific disciplines, etc.), and "What works?" (e.g. incentive packages for staff retention, a more inclusive organisational culture, etc.)

In fact, the types of research questions we ask is often dependent at the particular state of knowledge we have about a problem. Figure 3 outlines the different stages of an applied research cycle and their associated research questions. The following discussions show how the various stages – problem specification, intervention development, evaluation and implementation, and outcome assessment – carry distinct types of research questions, and how these differing questions in turn implies different types of appropriate research designs.

1. Problem specification

How we conceptually frame and perceive an issue for research is often itself worthy of investigation (Alvesson & Sandberg, 2011). Problem specification is about setting the terms of reference for a particular research project. In applied research, how we

define problems depends not only on what 'facts on the ground' there may be, but also on our mental models and value systems – in fact, it is our interpretation of these 'facts on the ground' that first gives rise to the identification of a problem. Therefore, specifying the content and the nature of a problem for investigation can often become political in a process that is meant, and often assumed to be, objective. As such, it is important to be clear about *why* we are researching into a particular issue, to make explicit those tacit assumptions that we inevitably hold in framing a particular organisational problem prior to research. It is thus at this initial stage of the research cycle that engagement with stakeholders, and not just gatekeepers, in research is vital, to ensure our problem definition is not biased by a dominant perspective or the status quo.

When no established consensus exists amongst the range of stakeholders on the nature and/or content of the problem, it is precisely the occasion for using exploratory, participant-led research approaches, where the research question becomes that of finding out the different aspects of the phenomenon from stakeholders' perspectives, particularly from those groups that might have been previously marginalised. It is here that qualitative research methodologies play a leading role.

On the other hand, the parameters of a problem may be already adequately-defined by previous researchers, but there may be disagreements amongst stakeholders regarding the extent to which the problem is happening, and/or only anecdotal evidence exist that point to the scale of the problem.

In such scenarios, quantitative descriptive research that provides objective measures on the extent of the problem helps to provide an appropriate evidence base for informing decisions on the next steps of tackling the issue.

2. Cause Exploration

Once a phenomenon has been adequately understood as to its nature, and/or have its parameters clearly specified, the next set of questions is concerned with exploring its causes and conditions, or what may be referred to as 'antecedents' of a phenomenon. Factors underpinning an issue could be grouped according to whether they are enabling or disabling ('facilitators' or 'barriers'); or if they are primary or secondary causes; and/or by levels of analysis (e.g., individual-, team-, organisation-, and system-level factors). These could be explored qualitatively or quantitatively, depending on the level(s) of analysis desired.

Qualitative research designs may be appropriate when we are trying to understand the phenomenon at the local level where contextual information is needed, and where we adopt the view that individuals are causal agents of organisational action in their own right, and their experiential knowledge of the situation and their own interpretations of what is going on are important to account for how and why a problem occurred.

On the other hand, at higher levels of systemic analysis when explanations are sought that could explain variations at the population level, it would be most appropriate to explore causal factors quantitatively. Experimental and quasi-experimental designs play a crucial role at deriving

causal explanations by testing hypotheses that researchers have developed regarding the causes of a phenomenon, which are theorised either inductively (from participants' accounts) or deductively (from theory). Qualitatively generated causal explanations in one setting cannot be applied to other settings without determining the degree of transferability of insights, which is dependent on contextual similarity between the two settings or lack thereof. Quantitatively generated causal factors for one population, on the other hand, cannot assume to automatically apply to another population without determining their generalisability. In the latter case, not only do we need to account for a sample's representativeness of the underlying population, but we also need to be cautious about the extent to which there is comparability across population profiles and history of health systems development when reviewing evidence generated in other jurisdictions.

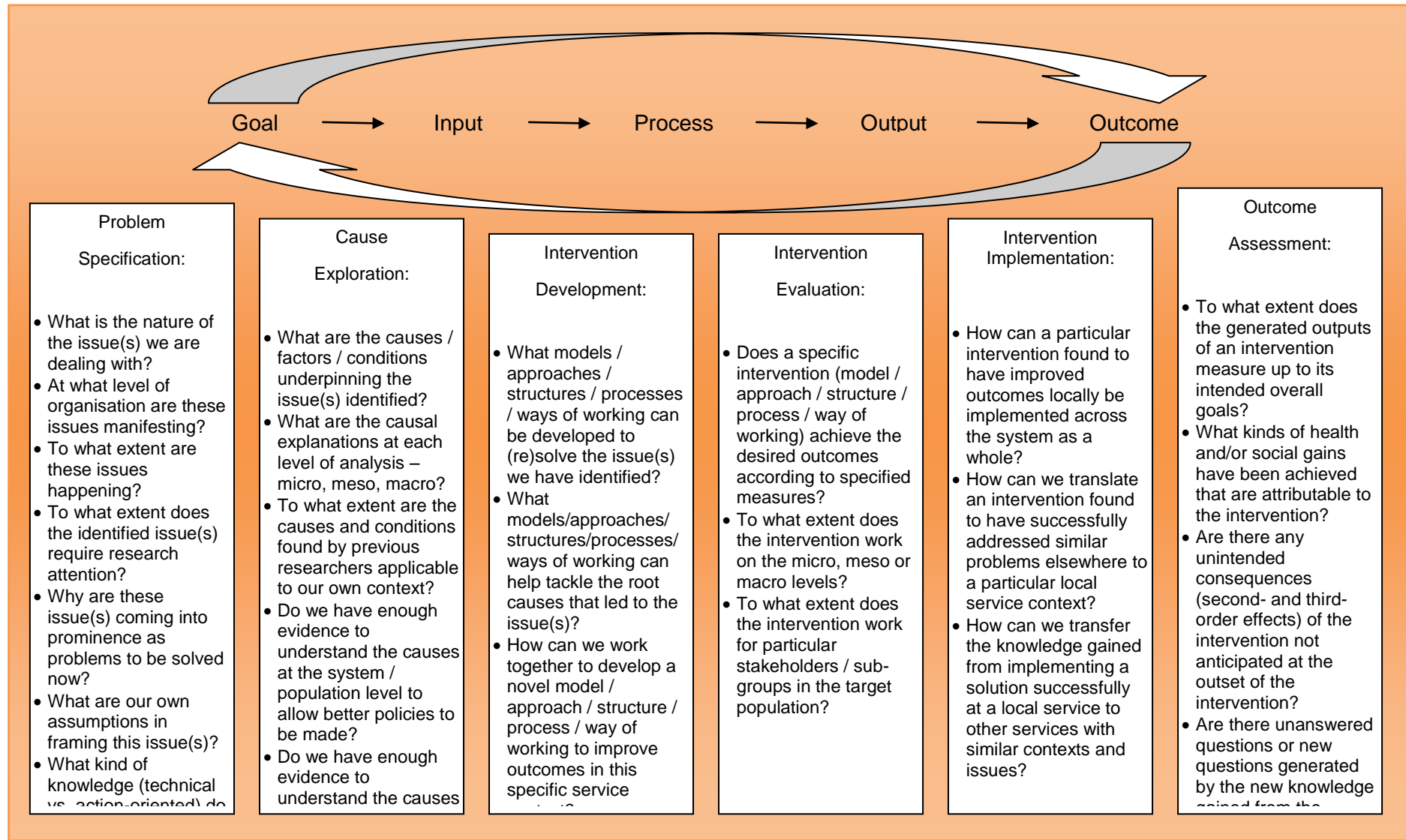


Figure 3. Identifying research questions at each stage of the applied research cycle

3. Intervention Development

Where there exists already a consensus on the issue to be tackled, and a body of literature established that gives robust evidence on its causes and conditions, the next set of research questions to be tackled are of the “how” and “what works” variety. Intervention studies form the bulk of published health services research, yet often they are of relatively poor quality (e.g. the hundreds of single-group post-intervention studies that are conducted without baseline and without controls). Such studies, though widespread, are of limited value to the overall evidence base, since they tell us little about whether an intervention really works even at the local level (given the lack of baseline data), and whether the indicators used to measure the intervention’s efficacy are indeed appropriate. Even if we accept such evidence at face value, we would understand little about how the intervention has resolved the problem, since there is often no deliberation on the mechanism that underpins how the intervention is supposed to have worked.

Therefore, whilst it is often useful to pilot interventions based on a good hunch derived from one’s close observations of practice; these studies should only be regarded as proofs-of-concept exercises even when quasi-experimental designs are used. A case-control study may be sufficient for determining if an approach makes a difference in outcomes locally, but without multi-site randomisation that helps to weed out setting- and subject-specific variations, we cannot claim to have generated evidence that will have generalisability across the system as a whole.

Furthermore, without considering how an intervention actually creates the observed beneficial outcomes, there is little sense in applying the same intervention elsewhere even when it has been found to be helpful in one setting, as we cannot assume that the implemented intervention is indeed the mechanism behind the changes in the observed outcomes. Positive outcomes may simply be down to the local team being given an opportunity for reflective, collaborative practice in the course of designing and implementing an intervention, which create spaces for more open communication among team members. Improved outcomes may therefore not necessarily be observed in other services where professionals are not given similar room for reflective practice, but are simply told to implement ‘best practice guidelines’ that are based at best on incomplete evidence generated elsewhere. In answering the ‘How’ question of intervention development therefore, approaches that combine both intervention evaluation and reflective practice may often be the most appropriate.

4. Intervention Evaluation

Measurement is one of the principal activities of science, and is of vital concern across a broad range of social research contexts (DeVellis, 2003). In health services research, this is especially true for studies that are aimed to evaluate interventions. If issue specification, antecedents and processes are all adequately addressed by previous researchers, we can conduct evaluative investigations to assess which approach best tackles the problem by comparing the efficacy of different interventions at different levels of analysis. Here, experimental and quasi-experimental designs (see

Fulop et al., 2001 for a brief overview) are the most appropriate in providing robust objective evidence we need for systemic evaluation, and randomised control trials remain the 'gold standard' in giving us answers regarding 'what works'.

However, the validity and reliability of evidence does not depend only on the research design chosen, but also on the appropriateness of indicators used to measure the service's outputs and outcomes. Output indicators should not be confused with outcomes, even though politicians may conflate them for self-serving purposes, as a way to show that 'something is being done' rather than demonstrate that what is being done is indeed beneficial to the patients and the general public.

Outputs are service-related indicators, which are broken down into those that measure efficiency (e.g., number of care episodes processed, waiting time, length-of-stay, etc.); versus those that measure effectiveness, (e.g., number of appropriate referrals, etc., see Dlugacz, 2006 for a discussion of different types of measures used in evaluating service quality in healthcare). Outcomes, on the other hand, are patient- and population-specific health and social gains (e.g., user-related/defined indicators, e.g., mortality, quality-of-life indicators such as QALYs, patient satisfaction, etc.). Whilst a service may be efficiently-run in terms of its service outputs, it does not necessarily mean the system is *effective* in terms of patient experience and population health outcomes (e.g. a high volume of throughput of acute care patients in factory-style clinical service lines may not be indicative of the well-being of individual patients nor of the population as a whole, even

though it may be a highly *efficient* means of processing clinical cases). In defining our research questions regarding 'what works', we must never confuse or conflate service-related outputs with outcome measures relevant to citizens' health and social well-being. There may be a tendency to become blinkered by the efficient functioning of a health service (i.e. targets-driven healthcare) and lose sight of the well-being of the end-users of our health service themselves, but such a tendency must not be indulged if we are to become serious about person- and people-centred healthcare. Where health and social gains may be anticipated to differ for various groups of citizens, these should be specified as part of the research questions so that appropriate research designs can be employed to allow for sub-group comparisons using appropriate measures.

5. *Intervention Implementation*

Once a particular service intervention is shown to offer demonstrable benefits to particular client groups; or a particular teamwork model is shown to result in tangible positive outcomes at the team and individual levels in one area, the natural desire is to ensure the implementation of such interventions across the system as a whole. Here, we again encounter the 'How' question, but instead of the 'How to develop' question as we have dealt with under Intervention Development, we are now concerned with questions of 'How to implement' – both for top-down implementation of system-wide guidelines; as well as to translate local 'success stories' for bottom-up implementation nationally or even internationally.

Until very recently, both *intervention development* as well as *intervention implementation* have been neglected in the health services research literature, which is dominated by intervention evaluation studies answering the 'What works' question⁴. This situation is ironic, as service development and implementation are key issues in healthcare management, and these are best addressed by organisational research with a *process* focus. Process research pays attention to the mechanism of how something – whether an organisation as a whole or a particular model of operation – works to achieve its aims. It involves research questions regarding not only the objective steps involved in any work processes (tasks and activities performed, resources expended, personnel required, etc.), but also those questions that relate to the structure and culture of an organisation. We need to determine to what extent we require not just technical how-to knowledge, but also to translate said knowledge into meaningful action, and such implementation questions are best addressed by process research methodologies such as action research.

6. Outcome Assessment

No intervention takes place in a vacuum. Although we may be confident about the efficacy of an organisational intervention under experimental conditions, there will always be second- and third-order

effects resulting from how such an intervention interacts with the social structure once it is implemented in local practice. Indeed, when an intervention has been implemented across the board such that it results in systemic change for the health and social care service as a whole, there will always be unintended consequences – both positive and negative – of organisational action that cannot be planned for *a priori*. Thus, once an intervention is introduced into a system, it behoves us to assess and re-assess its true consequences in the medium and long term, rather than assume that its outcomes will remain aligned with the original goals that were identified when it was first developed.

This is why outcome assessments must be linked back to how we define and specify research problems at Stage 1 of the applied research cycle. Unlike human biology, the underlying mechanisms of which may be relatively stable over centuries, organisational and social phenomena are comparatively fast changing, and we cannot assume that the knowledge gained about our health service organisations even a decade ago would still hold true for the present and future. Periodic assessments are necessary not only of the outcomes of the implemented interventions, but also of our own ongoing and ever-changing service needs and preferences, perceptions and beliefs. How we view health and social care problems, our social statuses and attributes, indeed our social structures and cultures, are always in a state of flux, and research must keep pace with the new questions that arise so that our theory and evidence base are

⁴ There are also stepwise evaluation research methodologies, popular within operations management research, which are concerned with investigating the efficacy of an organisational intervention at each step of its implementation. I group these methodologies under the banner of 'process research'.

continually updated to reflect such changes.

Conclusion

Regardless of which stage of the applied research cycle we are concerned with for a particular research project, in defining research questions we should always make reference to the overall goal of the applied research itself. Therefore, problem specification is always the primary determinant in any deliberation about the appropriateness of a particular research design. Research design then, is the means by which we find appropriate answers to particular research questions. In the context of health services research, it is always aimed at generating evidence that can help us decide on policies and/or practices that contribute towards specific health and/or social gains. As Figure 4 illustrates, in applied research, not only do we need to be cognisant of the type of knowledge being generated by a particular research design, but we also need to make explicit links to the kind of organisational actions it is aimed to achieve.

Research methodology should always be seen for what it is – a means to a specified end. Rather than being led astray by fierce debates and polemics about the supposed superiority of one methodology over another (often in the context of so-called ‘paradigm wars’ in the methodological literature, see Morgan, 2007 for a summary review), we would do well to adopt a pragmatist approach and choose research methods fit for a defined purpose. Instead of assuming that a ‘gold standard’ methodology such as RCT will by itself deliver ‘cast-iron’

evidence in health services research at all times, we need to be critical about how well a particular methodology matches up with our research objectives for a specific project. Box 1 summarises the considerations we would need to take into account when choosing a research design appropriate for a particular purpose.

Box 1. Checklist for Matching Research Designs to Organisational Issues

The following questions should be considered when choosing a research design:

Research Objective

Why are we doing this? Which issue are we trying to address? Do we need to explore the issue as to its parameters and/or its causes, or is it a question of developing, evaluating or implementing a ‘solution’?

Research Question

What questions do we need to ask to achieve our specific research objective?

Research Sampling

Which sources could give us the information we need to answer the Research Question? Who can give us the information we need? (Target Participants); and/or What can give us the information we need? (Databases and other Archival Materials)

Feasibility

How practical is it for us to get information from these sources? Who do we need to get permission from to access the research sample? What are the relevant ethical approval process and time-frames? What are our resources (human, financial, technological) and time-frame for research completion?

Critical Reflection

Are our proposed means (Research Design) appropriate to the ends? What are our intended research outputs? Do they answer our research questions? How well do our research outcomes match with our stated research objectives?



Figure 4. Deriving action from knowledge

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CRITICAL ANALYSIS OF RESEARCH LITERATURE

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How do I critically analyse research literature is a question often asked by students and novice researchers alike. Different educators hold different requirements from their students in their critical analysis. For example, critical analysis can often refer to processes as simple as interpretation and explanation; to more complex processes like evaluation and inference. As a result, two questions from budding researchers emerge: (1) “*What is being asked of me?*” and (2) “*What is my best approach to achieve what is being asked of me?*” The answer to both is *all of the above*. However, critical analysis is not as daunting as this may sound; though, it is important to recognise that it is a *process* of skills. This process might be better described as an ability to *critically think* about the topic in question.

Critical thinking is “purposeful, self-regulatory judgment – consisting of the skills of analysis, evaluation and inference – that increases our chances of solving a problem or drawing a conclusion to an argument” (Dwyer, Hogan & Stewart, 2014, p. 43). It is in this context that doing as much as we can (analysing, evaluating and

subsequently inferring – all in a reflective manner) will exhibit our care and caution towards the conclusions we draw; and facilitate our ability to appropriately *analyse research literature*. The focus of this chapter is to outline and describe the application of skills necessary for critical analysis of research literature; analysis, evaluation, inference and reflective judgment. However, before delving into this discussion, it is vital to first consider the role an organised structure plays in critical analysis.

Organised Structure in Critical Analysis

The first step in any form of writing is to acknowledge that all text and dialogues that contain the words ‘*but*’, ‘*because*’, ‘*however*’, ‘*therefore*’, ‘*thus*’, ‘*yet*’, etc. are arguments. An argument is not simply a heated debate that considers opposing sides, it is the presentation of a claim or some point of view, along with reasons and/or objections that either support or refute the claim. Thus, a critical analysis is an argument, as it draws on existing evidence to support a conclusion or hypothesis. All arguments share the characteristics of being composed of a network of propositions, prose-based or otherwise, that are structured via logical, inferential relationships (e.g., a central claim or conclusion; reasons for why the central claim is true; objections to the central claim; reasons for why the objection is true; and rebuttals that object to objections). The manner in which these propositions are organised will dictate the structure of the critical analysis and will help shape what conclusions are drawn.

Many educational technologies have been developed to aid students and novice researchers in the structuring and organisation of their work, including argument mapping and outlining. Argument mapping, distinct from mind-mapping (see Dwyer, 2011), is a visual representation of a logically structured network of reasoning, through which an argument is made unambiguous and explicit (see Figure 1). However, others prefer more traditional techniques such as outlining (see Figure 2). The important thing is that, regardless of the strategy used, the hierarchical structure of the argument is represented (Dwyer, Hogan & Stewart, 2011; 2013); and helps facilitate and maintain the logical flow of the argument.

All critical analyses consist of three parts: an Introduction, the Body and the Conclusion. Colloquially, within the Introduction, you should “Tell them what you’re going to tell them”. That is, you will introduce your readers to your research statement or central claim by briefly identifying what this piece is attempting to argue; why this particular concept is important; and why you believe this argument – better yet, why you want your reader to believe the argument. This is a crucial function of the introduction, as the reasons you list within for why you believe this stance are the core elements to be discussed within the analysis proper, or *the body*.

Whereas in the introduction you *told them what you are going to tell them*, in the body, you will *tell them* by presenting, in detail, each of the core reasons for why you believe the central claim. Each reason is important and thus deserves its own

paragraph. As one paragraph equals one idea unit, a good rule of thumb is that each paragraph should contain no less than three sentences – the minimum required to adequately formulate an idea (e.g., as in syllogisms). Within the body, you should also address objections (i.e. opposing perspectives), or reasons why one should not believe the central claim. Such objections can refer to core objections (i.e. as listed within the introduction), or as objections to core reasons. If there are objections, then present them where relevant (i.e. next to the idea to which it is objecting), as opposed to breaking the analysis down into sections of ‘for’ and ‘against’. This strategy will facilitate logical flow and help your readers avoid cumbersome attention switching.

Though objections are important, it is not advisable to ‘go overboard’ with them, as you do not want to persuade the reader to disbelieve your initial claim. Otherwise, your readers might wonder why your central claim is not that of the opposing perspective⁵, perhaps rendering your analysis susceptible to unnecessary criticism. Thus, it is important that you also attempt to refute objections as well. On the other hand, one might ask what is the point of objecting to a proposition if they, themselves are going to subsequently refute that objection. Simply, providing objections and refutations exhibit two important features of a critical analysis. First, it shows that you have considered both sides of the argument and that you

⁵ In the event that your analysis concludes with more objections than supporting reasons, depending on the strength of these reasons and supports (see section on *evaluation*), it is recommended that this alternative view is adopted as the central claim.

have knowledge of the topic area. Second, it shows that you have indeed critically analysed and evaluated the topic.

Finally, within the conclusion, your aim is to *tell them again* by reiterating the central claim and explaining why you believe your central claim with a little more specificity than in the introduction. This can now be done because you have already discussed it in the body; and thus, it is here you can succinctly reiterate reasons for your reasons (or objections for your objections, reasons for your objections and objections for your reasons). It is within the conclusion, or *discussion*, that you should also concisely reiterate your conclusions and findings by explaining and interpreting them (e.g., with respect to their implications, limitations, potential future research and again, why this is important).

Analysis

Consistent with the perspective regarding structure and organisation above, analysis is a critical thinking skill used in the context of argumentation to detect, examine and identify the propositions within an argument and the role they play (e.g., the main conclusion, the premises and reasons provided to support the conclusion, objections to the conclusion and inferential relationships among propositions; Dwyer, Hogan & Stewart, 2014; Facione, 1990). At the core of analysis is the ability of an individual to identify the structure of an argument, which depends not only on their knowledge and skill as a reader/listener, but also on the way in which the author of the argument uses relational cues, or signals, that guide the reader/listener (Meyer, Brandt & Bluth, 1980). For example, words like

but, because and *however* can be used by the author to indicate that propositions that follow are *objections, reasons, or rebuttals* for propositions that have come before.

In the context of reading, these relational cues also shape the organisation of paragraphs within an argument, as well as the various paths of reasoning an argument may take based on the evidence presented. For example, an author may decide to present all their reasons in support of a particular claim in the first few paragraphs of their argument and follow this with a series of paragraphs presenting all the objections in relation to a particular claim, followed by justification for these objections, and/or rebuttals. Alternatively, an author may choose to mix reasons, objections, and rebuttals throughout all of these paragraphs; and thus, sequence and organise their argument in different ways. The organisation and identification of propositions within an argument is critical for the reader, as the structure of propositions has been found to affect the reader's ability to comprehend the information within the argument (e.g., Meyer et al., 1980; Myers, 1974; Munch, Boller & Swasy, 1993).⁶

In addition to identifying the structure of an argument, the skill of analysis also involves the identification of propositions' sources. In this context,

⁶ The latter option of 'mixing reasons, objections and rebuttals throughout' is preferred. To reiterate, if there are objections, then present them where relevant (i.e. next to the idea to which it is objecting), as opposed to breaking the analysis down into sections of 'for' and 'against'. This strategy will facilitate logical flow and help your readers avoid cumbersome attention switching.

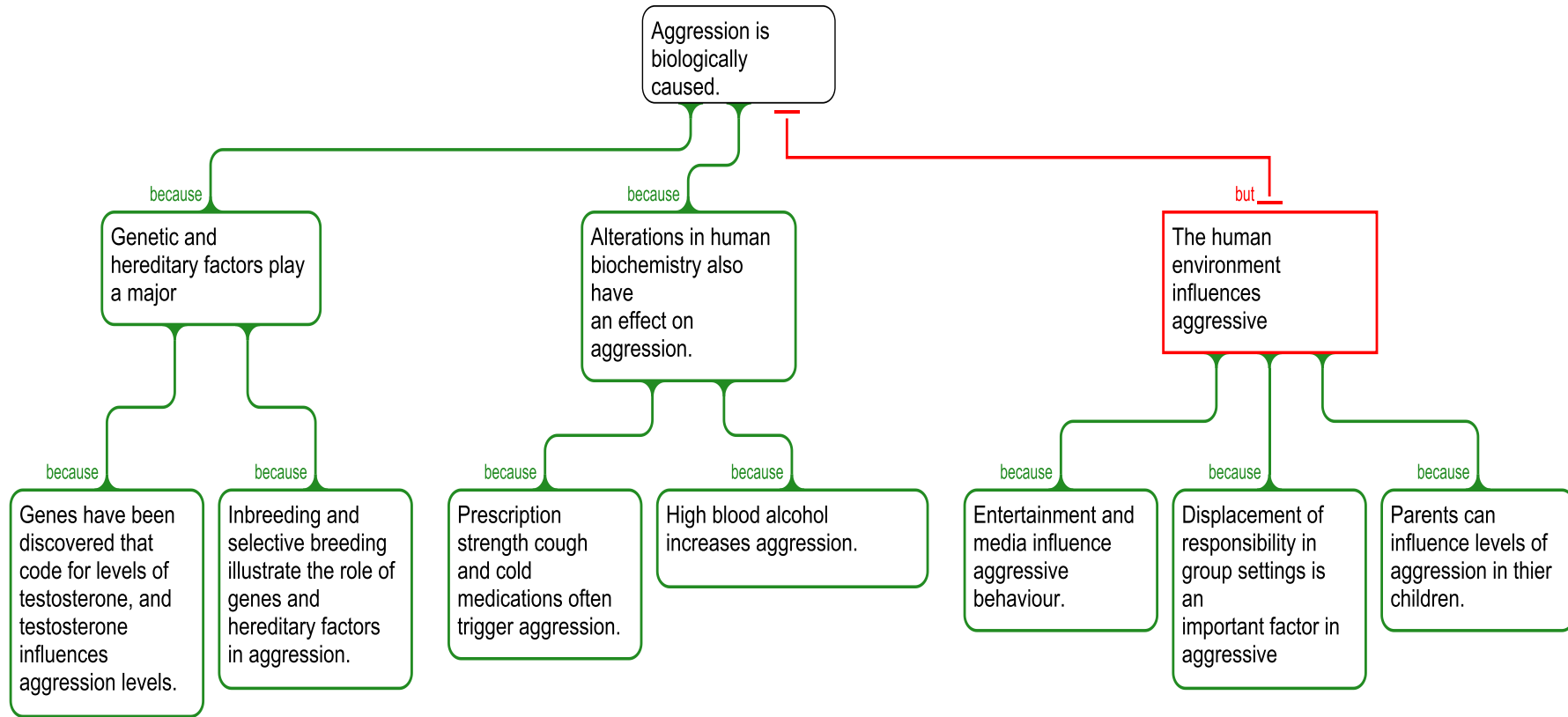


Figure 1: An Example of an argument mapping created through Rationale™

- I. Introduction
 - I. Something Quotable (Optional)
 - II. Central claim
 - III. Why is it important?
 - IV. Core Reasons
- II. Body
 - I. Core Reason 1
 - I. Supporting Reason 1
 - II. Supporting Reason 2
 - III. Supporting Reason 3
 - II. Core Reason 2
 - I. Supporting Reason 1
 - II. Supporting Reason 2
 - III. Supporting Reason 3
 - III. Core Reason 3
 - I. Supporting Reason 1
 - II. Supporting Reason 2
 - III. Supporting Reason 3
 - IV. Core Reason 4
 - I. Supporting Reason 1
 - II. Supporting Reason 2
 - III. Supporting Reason 3
 - V. Core Reason 5
 - I. Supporting Reason 1
 - II. Supporting Reason 2
 - III. Supporting Reason 3
- III. Conclusion
 - I. Restatement of Central Claim, Importance & Core Reasons
 - II. Summarise
 - III. Implications, Limitations & Future Research
 - IV. Concluding Points

Figure 2: An example template of an outline

analysis is conducted by identifying types of arguments with respect to where they are coming from (i.e. anecdotal evidence, common belief statements, expert opinion, statistics and research data). The ability to identify these sources is integral to the second step in the critical analysis process – evaluation.

Evaluation

Critical analysis does not simply end with analysis – it requires additional processes. Evaluation is one such process that is used in the assessment of propositions and claims with respect to their credibility, relevance, bias and the logical strength of their relationships with other propositions; thus deciding the overall strength or weakness of an argument (Dwyer, Hogan & Stewart, 2014; Facione, 1990). Evaluating the credibility of claims and arguments involves progressing beyond merely identifying the source of propositions in an argument, to actually examining the credibility of those identified sources (e.g., personal experiences, common beliefs/opinions, expert/authority opinion and scientific evidence). Evaluation also implies deep consideration of the relevance of claims within an argument, which is accomplished by assessing the contextual relevance of claims and premises (i.e. the pertinence or applicability of one proposition to another). Evaluating the logical strength of an argument is accomplished by monitoring both the logical relationships amongst propositions and the claims they infer. Finally, evaluating the potential for bias, omission, and imbalance in an argument allows for progression beyond identifying an argument's underlying motives, to being able to

question and adequately address these motives.

In order to determine the strengths and weaknesses of an argument, a series of evaluative questions must be asked. The first question asks, '*How strong are the types, or sources, of arguments presented?*' As identified in the discussion of the skill of analysis, the different types of arguments that may be presented can be based on anecdotal evidence (or stories of personal experience); expert opinion (or an authority opinion); common beliefs; statistics; or research findings (e.g., case studies, survey research, correlational research or experimental research). Anecdotal evidence and common beliefs are evaluated as weak in comparison with evidence from empirical research. However, each source can have its own limitations (e.g., two pieces of contrary research or findings, which may result from the quality or methodology of the research); and thus, there remains a need for in depth evaluation and the possibility to object to such claims. The second question one must ask is '*How relevant and logical are the arguments?*' This question is asked because some propositions used within an argument may not be relevant or logically connected to the central claim. If they are irrelevant or illogical, the propositions in question need to be addressed and if necessary, excluded from the argument. The final question that must be asked is whether or not the overall argument is imbalanced in any way. For example, does it exclude important arguments? Is it biased? Are there hidden assumptions that need to be made more explicit? What was the author's purpose for making this argument? Though it takes time to find credible,

relevant evidence to support arguments, every link in the chain of reasoning used to support arguments needs to be logically strong. One weak link may lead to doubt being associated with the argument as a whole.

Inference

The final process necessary for critical analysis of the research literature is the critical thinking skill of inference. Inference refers to the “gathering” of credible, relevant and logical evidence based on the previous analysis and evaluation of available evidence, for the purposes of “drawing a reasonable conclusion” (Facione, 1990, p.9). Inference is a unique form of synthesis in that it involves the formulation of a set of consequences and conclusions derived from a set of arguments or a body of evidence. This may imply accepting a conclusion pointed to by another (e.g., author or speaker) in light of the evidence they present, or “conjecturing an alternative”, equally logical conclusion or argument based on the available evidence (Facione, 1990). Another important aspect of inference is “querying the evidence” available, for example, by recognising the need for additional justification and by being able to gather such additional information to draw a conclusion; and to judge the plausibility of utilising such additional information or justification for purposes of conjecturing an alternative conclusion. In the context of querying evidence and conjecturing alternative conclusions, inference overlaps with evaluation to a certain degree in that both skills are used to assess the acceptability of a claim or argument. Nevertheless, it remains necessary to query and judge the inclusion of propositions within an argument,

before gathering them to draw a conclusion.

When using the skill of inference, one must gather the information (i.e. propositions) previously analysed and evaluated as credible, relevant and logically sound; and use them to infer a conclusion. It is also important to consider that though inference based on *informal logic* (e.g., the type of logic used for scientific justification) does not adhere to a formulaic method, the basic principles of syllogistic reasoning are kept in mind (e.g., similar structure and the use of terms such as *some, all, none, if, then, etc.*, will affect the conclusion we infer, regardless of whether it is completed in the formal or informal tradition). On the other hand, inference in informal logic is common in scientific thinking as well as most day-to-day applications; and is a grounded, practical strategy which stresses the provision of justification for every reason and objection related to a claim or conclusion. For example, scientific understanding is derived from reading many individual research studies. Each study finding should allow for the arguing of the existence of some observed relation. For many scientific questions, there will be several lines of reasoning – many observed relations – that lead to an overall conclusion. In the context of inference in informal logic, an argument with a justifiable conclusion will have lines of reasoning arranged such that: (1) related arguments are grouped together; (2) groups of related arguments are used to derive intermediate conclusions; and (3) intermediate conclusions are used to derive higher-level conclusions and so on, until an overall conclusion is derived.

Good inference ability depends on good evaluation and, as previously mentioned, though there is a certain degree of overlap between the two, it is also important to note that they differ. Inference differs from evaluation in the sense that the process of inference involves *generating* a conclusion from propositions. Being an autonomous thinker means that one draws their own conclusions. We do not spend our lives simply evaluating other people's thinking; rather, we generate our own conclusions. With that said, we must also evaluate our own thinking and subsequent conclusions much the same way as we evaluate the thinking of others.

After inferring a conclusion, we evaluate the argument again and perhaps infer, the second time around, that our original conclusion is false. We might then alter our argument or alter our conclusions, or both. In other words, when applying the skills of evaluation and inference, we progress in a somewhat cyclical manner – from evaluation to inference, back to evaluation and again to inference, again and again. As we do so, our thinking becomes more orderly, complex and logical.

Reflective Judgment

The ability to think about writing and thinking itself in this manner (Dwyer, Hogan & Stewart, 2015; Flavell, 1976; Ku & Ho, 2010) implies a reflective sensibility and the capacity for reflective judgment (King & Kitchener, 1994). Reflective judgment is an important skill to acquire and practice for critical analysis of research literature (Dwyer, Hogan & Stewart, 2015). Reflective judgment is an individual's understanding of the

nature, limits and certainty of *knowing*; and how this can affect how they defend their judgments and reasoning in context. Moreover, reflective judgment involves the ability of an individual to acknowledge that their views might be falsified by additional evidence obtained at a later time (King & Kitchener, 1994).

The ability to acknowledge levels of certainty and uncertainty when conducting a critical analysis is important because sometimes the information a person is presented with (along with that person's pre-existing knowledge) provides only a limited source of information from which to draw a conclusion. This is often the case when a person is presented with an ill-structured problem (King, Wood & Mines, 1990), that is, a problem that cannot be solved with absolute certainty (Wood, 1993) – as is the case inherent in a critical analysis (i.e. there is no right-or-wrong- answer, but rather a perspective). For example, when an ill-structured problem is encountered, uncertainty associated with the problem indicates that multiple paths of reasoning and action are possible (e.g., '*What is the best way of decreasing global warming?*'). Such encounters often lead thinkers to reasonably consider multiple, alternative solutions (e.g., '*Make everyone drive electric cars*', or '*Cut down on cattle farming in order to lower methane emissions*'). However, some solutions are deemed better than others based on the organisation, complexity and careful consideration of the propositions within the argument (e.g., in comparison with the unsupported singular claims above, a more complex and better considered response might propose that '*Although research is still on-going in this area,*

mathematical models based on existing research findings suggest that by making small decreases in emissions in all walks of life, whether it be travel, farming, industry or energy production, emissions around the globe will decrease substantially). Therefore, it is not only the conclusion one reaches, or the inference one draws, correct or otherwise; but also the manner in which one *arrives* at the conclusion (i.e. the critical analysis) that is important.

Simply, we can never be 100% sure about anything, given that we cannot *prove* anything (e.g., quantitative research is conducted to *disprove* the 'null hypothesis', which is distinct from *proving* the 'alternative hypothesis'; see Popper, 1934/2005). As a result, it is how one treats information (e.g., organises, structures and presents information) that will dictate the power of their argument. In addition to organising a well-structured argument, it is imperative to acknowledge the uncertainty associated with the ill-structured problem by, again, presenting both reasons and objections to propositions within your argument.

Critical Thinking & Appraisal for Health and Social Care Professionals

Given the increasing amount of research conducted and available in areas relevant to Health and Social Care Professionals (HSCPs), it has become vital for HSCPs to develop the appropriate *appraisal* skills necessary for successful critical analysis of research literature, in order to ensure the most up-to-date research in clinical practice is adopted and implemented. Consistent with the perspective of critical thinking discussed in this

chapter, critical appraisal refers to the process of carefully and systematically examining and judging the credibility, reliability, value and relevance of a piece of research in a particular context (Burls 2009). Alongside critical thinking, HSCPs often use checklists (e.g., the Critical Appraisal Skills Programme [CASP, 2015; Singh, 2013]; Centre for Evidence-Based Medicine [CEBM, 2015; Phillips et al., 1998]; and the Scottish Intercollegiate Guidelines Network [SIGN, 2015; Shea et al., 2007]) to critically analyse, evaluate, infer and appraise research literature. Specifically, the checklists provide a series of questions for the HSCP to facilitate the critical appraisal process (e.g., in appraising a systematic review, quantitative research and qualitative research; see Table 1).

With respect to systematic reviews, appraisal is necessary in order to eliminate poorly designed/conducted studies and include and make recommendations based on the findings of the high quality studies. When a meta-analysis is performed as part of the systematic review, the results of the high quality studies (that met the initial inclusion criteria) are pooled to form a single statistical analysis of the results. High quality systematic reviews minimise bias from individual studies and also highlight potential gaps in the literature for future research. Given the restrictions in time within the health service, it is recommended that only recently published, high quality reviews should be utilised, given their superiority to individual studies (Hemingway & Brereton 2009). In the absence of a systematic review, primary research in the form of randomised controlled

trials (RCTs) follow in the hierarchy of quality regarding evidence source.

With respect to quantitative research (e.g., RCTs), CEBM outlines four questions that can be used to evaluate published clinical trials:

1. Does the study address a clearly focused question?
2. Did the study use valid methods to address the research question?
3. Are the results of the study valid and important?
4. If the results are valid and important, are they applicable to my clinical population or patient of interest?

In the event that the answer to one of these questions is 'no', then it is not advisable to continue with reading or appraising the full paper. Finally, on the third level of hierarchy of quality regarding evidence source is qualitative research. In qualitative research, a variety of methods to gain descriptive narratives can be used (e.g., one-on-one interviews, face-to-face interviews, online-facilitated interviews, focus groups, interactive management); and thus, qualitative data can likewise be analysed according to different methodologies (e.g., thematic analysis, interpretive

phenomenological analysis and grounded theory). As a result, there are a range of critical appraisal skills that may or may not be appropriate for certain types of qualitative research. However, a number of common features make it possible to appraise, through questioning, qualitative research studies (see Table 1 for CASP checklists for a systematic review, RCT and qualitative research).

Summary

Critical analysis of research literature is a process of applying critical thinking skills to research. Specifically, critical analysis involves much more than just the skill of analysis – it requires purposeful, self-regulatory, reflective judgment, evaluation and inference – all of which enhances our chances of drawing a logical conclusion to an argument. Critical appraisal, through the facilitation of a series of check lists, is also a commonly used method by HSCPs to help aid their critical thinking and analysis of research literature. Notably, it is only once we have applied these skills carefully and cautiously; and presented the resultant stance in a structured, organised fashion, can we exhibit our ability to appropriately analyse research literature.

Table 1: CASP Appraisal Tool for Systematic Reviews, RCTs and Qualitative Research

Using the CASP Tool for Systematic Reviews				
Section A	Are the results of the review valid?	YES	Can't tell	NO
1. Did the review address a clearly focused question? 2. Did the authors look for the right type of papers? 3. Did you think all important, relevant studies were included? 4. Did the review's authors do enough to assess the quality of the included studies? 5. If the results have been combined, was it reasonable to do so?				
Section B What are the results?				
6. What are the overall results of the review? 7. How precise are the results?				
Section C	Will the results help locally?	YES	Can't tell	NO
8. Can the results be applied to the local population? 9. Were all important outcomes considered? 10. Are the benefits worth the harms and costs?				
Using the CASP Tool for Randomised Controlled Trials				
Section A	Are the results of the trial valid?	YES	Can't tell	NO
1. Did the trial address a clearly focused issue? 2. Was the assignment of patients to treatments randomised? 3. Were all of the patients who entered the trial properly accounted for at its conclusion? 4. Were patients, health workers and study personnel 'blind' to treatment? 5. Were the groups similar at the start of the trial? 6. Aside from the experimental intervention, were the groups treated equally?				
Section B What are the results?				
1. How large was the treatment effect? 2. How precise was the estimate of the treatment effect?				
Section C	Will the results help locally?	YES	Can't tell	NO
1. Can the results be applied in your context? (Or to the local population?) 2. Were all clinically important outcomes considered? 3. Are the benefits worth the harms and costs?				
Using the CASP Tool for Qualitative Research				
		YES	Can't tell	NO
1. Was there a clear statement of the aims of the research? 2. Is a qualitative methodology appropriate? 3. Was the research design appropriate to address the aims of the research? 4. Was the recruitment strategy appropriate to the aims of the research? 5. Was the data collected in a way that addressed the research issue? 6. Has the relationship between researcher and participants been adequately considered? 7. Have ethical issues been taken into consideration? 8. Was the data analysis sufficiently rigorous? 9. Is there a clear statement of findings?				
10. How valuable is the research?				

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HOW TO CONDUCT A LITERATURE REVIEW⁷

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A literature review provides a basis for consolidating research findings within a specific area into a cohesive document that gives a clear indication of current progress, limitations and future directions of the research stream. It allows both practitioners and researchers alike to keep abreast of the latest research findings (e.g., on evidence-based therapeutic interventions). The aim of this paper is to provide a practical overview of how to conduct and write-up a literature review. Further to discussing the practicalities of how to carry out a literature search, the structure and methodology of a review article are considered. Finally, the subjects of formatting and publication are examined.

Questions to consider before you begin

1. Who is your target audience?

Having a clear idea for whom the paper is intended will help shape the style and content of the article. Hence, you need to decide who your target audience is. Is the review intended to influence senior managers who are involved in policy formation or implementation? Does it seek to

influence senior operational managers as to how they may develop services or manage particular service provision challenges? Is the literature review aimed at influencing practitioners to work in a different way? Is it trying to provide a better insight into a concept or theory, aimed at the scientific community? Or its purpose could possibly be to champion service user perspectives?

2. What publication do you intend to submit to?

Determination of your target audience will influence what publication you are likely to submit to. Given the choice of psychology-related publications (see Table 1), it can be difficult to know where to begin in terms of submitting a literature review paper. If targeting members of a profession, that profession's newsletter or journal may be appropriate, even for high quality literature reviews that would most probably be accepted for higher status publications. Interestingly, if targeting senior health care managers, they may not be interested in the ranking of a publication. Rather, they will most likely be interested in your being able to send them a PDF of your published paper on a topic that is of interest to them. Hence, it may be of benefit to choose a publication that most likely will accept your literature review submission in a timely manner.

If the purpose of your literature review is to add new knowledge to the existing literature base, you can ensure maximum effect by publishing in a journal with a high 'impact factor' (IF), especially one that your target audience holds in high esteem. The IF, a numeric value, is calculated each year by Thomson Scientific and is the average number of times papers in a

⁷ This paper is largely based on 'Keary, E., Byrne, M. & Lawton, A. (2012). How to conduct a literature review. *The Irish Psychologist*, 38(9-10), 239-245' & has been reproduced with the permission of the Editor of the Irish Psychologist.

journal have been cited in the previous 2 years (Dong, Loh, & Mondry, 2005). The higher a journal's IF, the greater its impact. Most academic libraries in Ireland have subscriptions to online resources such as Journal Citation Reports™ that gives the IF of journals in scientific and social science journals.

Another option is to consider publishing in an "open access" (OA) journal. Such journals make papers public, permanently and freely available. This means that your organisation or peers will not have to pay to access your paper when it is published. However, most OA journals require a standard article-processing charge. These fees may vary. A list of open access journals is available from the Directory of Open Access Journals (DOAJ) at <http://www.doaj.org> which are increasing every year. You can search by subject and there are currently 83 journals in the area of psychiatry⁸ and 501 in psychology. There is clear evidence that free access increases the number of article downloads, although its impact on article citations is not clear (Davis & Walters, 2011).

If targeting a particular journal, you need to review its author submission guidelines. These detail the journal's scope (e.g., psychotherapies, health services management) and the types of papers accepted (e.g., original papers, clinical case reports, brief research reports, review articles, perspective articles, historical papers, editorials, practice reviews, letters to the editor, book reviews). Some publications may prioritise and fast track original data papers, as they may be shorter papers (relative to longer

papers). So while details of the maximum acceptable length of each type of paper will also be typically profiled, it is advisable to use the minimum amount of words needed to write your paper.

While it is advisable to completely omit any formatting up until the final draft, the guidelines will also profile formatting requirements such as a title page, abstract (e.g., structured, unstructured), and key words, all of which may help future literature researchers. A common format for structured abstracts might include objectives; methods; results (or findings); and conclusions. Regarding referencing style, many psychology publications will adhere to the American Psychological Association (APA, 2009) style (i.e. alphabetised references), while other journals (typically medical) will require the Vancouver style where references are numbered in the order in which they appear in the text (International Committee of Medical Journal Editors, 1991). If the latter, unless you have software (e.g., Endnote) that automatically orders references numerically, it is best to use the APA style referencing for successive drafts and then convert to the Vancouver style for the final or submission draft of your paper. Guidelines will also provide details of how to present tables and figures, the inclusion of which can provide a better balance to a paper and hence better engage readers.

⁸ <http://www.doaj.org> Accessed 12.03.15

Table 1. Some psychology and mental health related journals

Publication	Description
Annual Review of Psychology	Highest ranking psychology journal (IF=20.533)*
Annual Review of Clinical Psychology	Third highest ranking psychology journal (IF=12.921)*
Clinical Psychology Forum	The official monthly publication of the Division of Clinical Psychology on the British Psychological Society (BPS)
Irish Journal of Psychological Medicine	Ireland's only peer-reviewed Psychiatry journal
Irish Psychiatrist	The official journal of the College of Psychiatry of Ireland
Psychological Bulletin	Second highest ranking psychology journal (IF=14.392)*
Psychology Review	Fourth highest ranking psychology journal (IF=7.719)*
Psychotherapy and Psychosomatics	Fifth highest ranking psychology journal (IF=9.37)*
The Irish Journal of Psychology	The peer-reviewed academic journal of The Psychological Society of Ireland (PSI)
The Irish Psychologist	The official newsletter of the PSI
The Psychologist	The monthly publication of the BPS

* Source: Individual Journal Websites; Accessed 13.03.15

3. What is the timeframe in which you want to publish your review?

Engaging with the relatively lengthy submission/ peer review / resubmission process of peer-reviewed journals will invariably add to the quality of your published literature review and will heighten its status, especially among the academic community. However, if for example you want to influence policy formulation, your review will need to be published while the issue you are focusing on is still in the spotlight. Hence, if you want to publish in a peer-reviewed journal, you need to remain 'ahead of the curve' in anticipating 'hot' topics. This means being able to identify topics that will be of interest to policy makers and starting your literature review possibly up to a minimum of one year before the issue becomes a pressing concern for policy makers (and/or service providers). An alternative and easier option would be to submit to a non-peer reviewed and lower status publication where the submission process will most likely be quicker.

Creating and maintaining momentum in any research project is important. Hence, you (and other contributors) need to ring-fence protected time to ensure that subsequent drafts of your paper are produced and reviewed in a timely manner so that your projected submission deadline is met. It can be difficult to re-energise your literature review project if it stagnates or progress slows considerably.

4. Decide on your research team

Rather than going solo and conducting a literature review by yourself, the quality of your final paper will benefit from asking others with knowledge of

the content area to work with you. For example, an academic and/or a clinician with a working knowledge of a particular topic could provide guidance on how to conduct your literature search, to identify key areas to analyse and to review subsequent drafts of your paper. To avoid confusion, advanced agreement is required regarding who is noted as first and subsequent authors. A good rule of thumb is to order authors, not based on seniority, but on the amount of work inputted into producing the literature review. It will also be important for you as lead author to drive the literature review process. You need to ensure that each contributor follows through in a timely manner on their input and to ensure multiple inputs are coordinated. To keep track of various drafts, it is advisable to insert the date in the header of each. You can track changes made to drafts by asking all collaborators to use the 'Reviewing' function in Microsoft Office Word, and then accept or reject these changes as appropriate. This function also facilitates the posting of comments throughout the text by each contributor.

Literature search

How to conduct a literature search

Before starting to search the literature, it is useful to spend a few minutes thinking about your search. To do this, begin by writing down your research question. Next highlight the subjects or keywords that are part of your question and the synonyms for these subjects. You also need to consider different spellings. The

literature will contain both American and European spellings (e.g., 'Pediatric' and 'Paediatric', 'behaviour' and 'behaviour'). To capture both sets of spellings you can use truncation and wildcards in your search. Each database differs in the symbol that it uses. For example, you could search for 'P*diatric' that would capture both variations of spellings. Alternatively databases are indexed using a thesaurus. You can search for your subject by clicking on thesaurus and it will return the preferred heading – this will include alternate spellings. The Cochrane Library, PubMed and Medline all use the MeSH (Medical Subject Headings) thesaurus. Thesauri in other databases vary. PsycINFO uses subject headings from the Thesaurus of Psychological Index Terms. This controlled vocabulary, also known as 'index terms' or 'descriptors', is used by APA's indexers to describe the content of a document. Consult a librarian for further advice on other databases.

Table 2 outlines some literature searching methods. While many will be familiar with the use of Boolean operators, the 'PICO' method is promoted by organisations such as the Centre for Evidence-Based Medicine (CEBM) in Oxford. More evidence-based tools and tips for searching are available from the CEBM website. Developed by librarians at the King's Fund Library, the 'ECLIPSE' method may be useful for health management and policy searches (Wildridge & Bell, 2002).

Table 2. Some literature searching methods.

Searching method	Some specifics of...
Boolean operators	<ul style="list-style-type: none"> • 'AND' – Narrows a search, making it more specific. • 'OR' – Broadens a search, making it more general. • 'NOT' – For example, 'anxiety NOT depression' will return results of articles about anxiety only.
'PICO' method (Richardson, 1995)	<p>Break down the search into its components parts:</p> <ul style="list-style-type: none"> • P – Population / Problem: characteristics that define a population or problem such as age group, gender, co-morbidities, etc. • I – Intervention / Indicator: type of treatment • C – Comparator (if applicable) – alternative(s) to main intervention, (e.g., placebo) • O – Outcome: effects related to the intervention, side effects, cost-effectiveness, reliability, etc.
'ECLIPSE' method (Wildridge & Bell 2002)	<ul style="list-style-type: none"> • E (Expectation) – What does the search requester want the information for? • C (Client group) • L (Location) • I (Impact) – What is the change in the service, if any, that is being looked for? What would constitute success? How is this being measured? • P (Professionals) • S (Service) – For which service are you looking for information? For example, outpatient services, nurse-led clinics, intermediate care?

Databases

Access to research databases is required in order to conduct a comprehensive literature search. Within the HSE, databases can be accessed through the HSE Library (www.hselibrary.ie). You need to have an 'Athens' account to login to the online library. To set up one, go to the HSE Library page, click on the area in which you work and then go to 'Set up Athens account' on the left hand side of the page. If you register on a networked HSE computer your account will be active immediately. Alternatively if you register outside the network, within 1-3 days your account will be activated. All staff directly employed by the HSE are eligible to apply for an Athens account – licences do not currently cover HSE-funded agencies and voluntary hospitals. In the disability sector there is a consortia

of intellectual disability and allied libraries called 'IDAAL' that have an online library available at <http://www.idaal.com>. The voluntary hospitals are linked to academic institutions with libraries onsite. Regardless of which Irish organisation you are working for, HSE libraries throughout Ireland operate an "open door" policy whereby you will be assisted with your research and given onsite access to libraries and online facilities.

There are over 2,500 titles and over 50 databases that can be accessed from the HSE Athens Library. The full list of the databases can be seen by clicking on 'A to Z Journal List' and by going into the index. Table 3 lists some of these, including some that are specific to mental health.

Table 3. Some databases that can be accessed through the HSE library.

Database	Description
American Journal of Psychiatry	<ul style="list-style-type: none"> The official journal of the American Psychiatric Association
CINAHL	<ul style="list-style-type: none"> Otherwise known as 'Cumulative Index to Nursing and Allied Health Literature'. Fulltext of over 770 journals in the area of nursing and allied health.
Clinical Key	<ul style="list-style-type: none"> Clinical research, e-journals, images, e-books, considerable fulltext e-content available.
Cochrane Library	<ul style="list-style-type: none"> Journals on mental health based on current empirical evidence for various audiences including researchers, policy makers, carers and service users
Dynamed*	<ul style="list-style-type: none"> Shown to be the most current point of care reference tool (Banzi et al., 2011)
Embase*	<ul style="list-style-type: none"> Coverage of over 7,500 journals. Largely a pharmaceutical database. Useful for toxicological research, adverse drug reactions information & clinical trial studies.
Lenus	<ul style="list-style-type: none"> An open access Irish repository for healthcare information
OneSearch*	<ul style="list-style-type: none"> Good for starting a search, this is a simple search interface that runs a search across multiple electronic journals and databases. Available from http://www.hselibrary.ie/east
OVID Nursing & Mental Health Collections	<ul style="list-style-type: none"> Database access to over 20 nursing & mental health journals
PsycINFO	<ul style="list-style-type: none"> Indexes papers from a range of peer-reviewed journals in the behavioural sciences and mental health. Contains over 3 million records and summaries dating as far back as the 1600s
PsycARTICLES*	<ul style="list-style-type: none"> Fulltext companion to PsycINFO
The Journals of the Royal College of Psychiatrists	<ul style="list-style-type: none"> The British Journal of Psychiatry, The Psychiatrist, and Advances of Psychiatric Treatment
PubMed	<ul style="list-style-type: none"> Citations for biomedical literature from MEDLINE, life science journals, and online books
Psychology & Behavioural Science	<ul style="list-style-type: none"> Fulltext coverage of over 400 journals covering topics in emotional and behavioural characteristics, psychiatry & psychology, mental processes, anthropology, observational and experimental methods
Uptodate*	<ul style="list-style-type: none"> Point of care clinical tool with evidence based summaries

*Databases may not be available in all HSE areas.

GS celebrated its 10th anniversary in September 2014 and its founders have continued to develop and expand it in that time. GS is quick, easy to use and can sometimes present an article you may have missed in your database search. To use it, go into Google, click the 'more' tab on the top the page and select 'Scholar'. Next select 'Advanced Scholar Search'. This will give you advanced search options where you can exclude terms 'without the words', search for phrases 'with the exact phrase', search for authors or within publications. There are more tips available from the 'Advanced Search Tips' link.

GS can also be accessed from the home page on the HSE library MyAthens website once you are logged into your Athens account. Like the other databases, you can also limit the time frame of your search using GS. This means that you could limit the search to more recent literature (e.g. since 2006). To do this type your search term into Google Scholar and when the results appear, there will be a tab saying 'anytime' under the search box. This will allow you to select literature that has been published since a specific year and remove older articles from your search result. When selecting the papers to be included in your review, you might want to ensure that included studies have a reliable methodology (see Table 4) and add useful knowledge to the research area.

Table 4. Dimensions of research papers that need to be considered.

Information	
Sample size and type	<ul style="list-style-type: none"> The sample size of the study needs to be noted. Where there a sufficient number of participants to achieve the desired statistical power? Can the findings of the study be generalised to a wider population?
Type of design	<ul style="list-style-type: none"> The type of design used will have implications for how the findings can be assessed. Was it an experimental, observational or longitudinal study?
Measures	<ul style="list-style-type: none"> What measures were used (e.g., self-report; implicit; other report or observational measures)? The names and purpose of these measures need to be detailed. For example, the Beck Depression Inventory II (BDI-II) is a screening questionnaire for low mood.
Setting	<ul style="list-style-type: none"> Laboratory or in Applied setting? Confounding variables can be controlled within the laboratory but how applicable are laboratory results in real-life settings?
Effect size	<ul style="list-style-type: none"> Measures the strength of a relationship between two variables and is a means by which the effectiveness of different studies can be compared.
Strengths and limitations	<ul style="list-style-type: none"> Did the paper adequately achieve its aim? Was the methodology suitable? Did it produce findings that can be applied within the field?
Other potential methodological features	<ul style="list-style-type: none"> Comparison group; Random assignment; Diagnostic homogeneity; Concurrent medication use; Pretest-Posttest design; Follow-up assessment; Service user and significant other feedback; Therapist and researcher ratings; Assessment of clinical significance; Use of experienced therapists; Manualised treatments; Provision of therapy supervision; Monitoring of treatment integrity

Another area that needs to be included when conducting a literature review is a search for “grey literature”. Grey literature is “that which is produced on all levels of government, academics, business and industry in print and electronic formats, but which is not controlled by commercial publishers” (New Frontiers, 1999). OA repositories, websites of professional groupings, clinical trial registries, theses and conference proceedings all constitute grey literature. The difficulty is that this type of research is tricky to locate. Generally, searching individual websites and using search engines (e.g., Google, Bing) will yield meaningful results.

In addition to the many journals and databases available, there are two valuable online resources available within the Irish healthcare system. Managed by the HSE library services, Lenus (<http://www.lenus.ie/hse/>) is an Irish internet-based repository for health care information (Lawton & Byrne, 2012). The materials hosted on this OA site include Irish publications on clinical research and evaluations of official policy. Another resource within the HSE is HSELand (www.hseland.ie). While this relatively new website is intended to support the training and development of staff working in the Irish health sector, it has the capacity to become an effective means of promoting and accessing current and historic health care documents and publications (McHugh, Byrne, & Liston, 2012).

Literature review write-up

Introduction

The introduction of a literature review needs to be kept as concise as possible and use a minimum amount of words. It is advisable to start with

a broader focus that becomes narrower and more specific as the introduction advances. The aims and objectives of the article also need to be laid out, as does the relevance of the review to the particular field. Is the review filling any gaps in the extant literature or is it introducing something new (e.g., a theoretical model or an intervention)?

Body of text

The body of the text needs to be divided up into subsections that hit the key points as laid out in the introduction. Each subsection can be titled so that the reader can more easily locate specific information if they require it. When profiling the referenced studies, specific information needs to be supplied. Each piece of information can be used to assess the quality of located studies and their findings. This information can also indicate what future research can be undertaken to expand upon current findings. It may be useful to produce a table with all the studies included in the review. The headings of the table may vary depending on the publication source and the type of review being conducted but the key ones may include the author and year, the design of the study (with the sample size and type included), the measures used in the study, and the findings (see Table 4).

Discussion

The structure of the discussion and/or conclusion section of a literature review is nearly the opposite to that of the introduction section. Its focus needs to be quite specific to begin with (i.e. address your research question based on your findings) and then it can broaden out (i.e. discuss the wider implications of your study,

including what further related research may need to be conducted). It needs to begin with a summary of the information presented in the body of the text. Further to outlining your findings, if some of these are inconsistent or incongruent with previous findings, you need to try to provide a viable explanation for such discrepancies. At this point, you may present a new theory or hypothesis to explain your findings. You then need to consider the limitations of your review. It is useful to provide some limitations. However, to demonstrate that these are not sufficient to discredit the value of your review, you also need to highlight the strengths of your review. Finally, on foot of your findings, it is worth considering the direction that future research needs to take.

Meta-analysis

You might consider conducting a meta-analysis if you want to compare the effectiveness of two or more clinical interventions in your literature review (e.g., CBT versus Psychoanalysis versus a Waiting List control condition). This statistical technique is commonly used to assess the performance and efficiency of health care interventions. It can provide information about the mean and variance of study populations, effect size variability and differences in moderator variables. Consult Field and Gillett (2010) for in-depth instructions of how to conduct a meta-analysis.

Publishing

Adhere to a publishing strategy

Haslam and Laham (2010) conducted a longitudinal study in which they evaluated the impact of two types of academic publishing strategies. They tracked the progression of 85 social

psychology doctoral students for 10 years. The first strategy was named 'quality' that was defined as the mean IF and article impact score. The second was 'quantity' which was the mean number of articles published. They found that the impact of the scientist in her/his field was associated more with the quantity of articles s/he had published than the quality of articles s/he had published. They concluded that it is as important, if not more important, to publish frequently as it is to publish in higher ranked journals. They also indicated that if a scientist restricts his/her work to high IF journals, doing so may limit the amount of publications s/he achieves and could possibly damage their long-term career prospects. Similarly, rather than papers being rejected due to their lack of quality, Hewlett (2002) posited that many rejections are due to a 'manuscript-journal mismatch' in which the submitted paper does not fit the perspective of the journal. Accordingly, submitting to a speciality journal may increase your chances of getting published.

Co-authorship within the field of psychology became increasingly common in the later decades of the twentieth century and is now considered quite typical (Cronin, Shaw, & La Barre, 2003). Indeed, research collaboration can be a fruitful research and publishing strategy within scientific disciplines and can lead to increased productivity in terms of the number of papers published, time saving and increased access to limited resources (Francescheta & Costantinib, 2010). Despite potential associated disadvantages (e.g., divergent perspectives on what should be included and who should receive the most credit; Sonnenwald, 2007),

collaboration is a useful consideration before commencing work on your paper.

The politics of publishing

In a widely-cited commentary on publishing in the field of science, Lawrence (2003) wrote that editors in highly rated journals may favour the 'safe and fashionable' articles over original pieces. This, he wrote, is due to the highly stressful environment in which editors have limited time to adequately read and review all the submissions they receive. This, he suggested, can lead to innovative research being rejected as editors are sometimes unwilling to risk publishing unfamiliar and unprecedented papers. He also suggested that increasingly busy editors can find it difficult to review specialised research and therefore more editorial power is put into the hands of the reviewers. The latter could then lead to a situation where a scientist abuses the reviewing role by holding up a competitor or by having a favourable bias towards a known colleague. Lawrence also suggested that there is pressure upon authors themselves as they are being judged more on where they publish than the quality of their work. His editorial goes on to examine the means by which such politics can be remedied, the key to which is to diminish the fixation upon journal ratings. He also suggested that authors publish more in OA websites and specialised journals.

In another article reviewing publication procedures, Schwartz and Zamboanga (2005) presented a range of methods by which the editorial and reviewing processes of journals can be improved. These included editors giving authors

feedback on their papers independent of the reviewers. They also advised that reviewers should not review the same paper more than once.

Resubmissions

Depending on the journal you submit to, your submission may evoke at least 4 categories of response: (1) Accept; (2) Accept with revision (i.e. minor revisions); (3) Revise and resubmit (i.e. major revisions); and (4) Reject. Anything but a complete rejection can be seen as positive (Hewlett, 2002). It is advisable to embrace and integrate reviewer feedback, and resubmit your revised paper in a timely manner, complete with a separate document outlining your response to each point of reviewer feedback (e.g., how you have integrated the feedback, or your rationale for not doing so).

Conclusion

A literature review can summarise a large volume of research within an area and provide a means to deliver a persuasive, evidence-based argument. It can be used to influence a variety of people, including managers, practitioners or service users. While conducting each literature review will present unique challenges, the process of doing so is similar for all reviews (see Figure 1). Before you begin your review, you need to determine your target audience. As it will influence the format and content of your paper, you need to know the type of publication you are writing for. If you are planning to impact policy making, you need to schedule projected publication while the targeted issue is still under consideration. You may consider working in collaboration with others.



Figure 1. Summary of steps to conducting a literature review.

There are many ways in which you can increase the range and specificity of your literature search. Being familiar with search methodologies can be useful in creating a stock of relevant literature for your review. It is also beneficial to use multiple databases when conducting your search. When writing up your review, a general introduction to the topic area needs to precede a consideration of more specific extant literature, and the key aims and objectives of the article. You need to review the identified research studies in the body of the text (see Table 4). Your discussion needs to consider your findings, the limitations of your review and any suggestions for future research.

Formulated from the outset, you need to adhere to your publishing strategy, be it to submit to low or high IF

publications. While both are open to biased or political interference, the process of submitting (e.g., peer review) to most publications will add to the quality of your paper and a better resource for colleagues and others.

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HOW TO DESIGN QUANTITATIVE RESEARCH IN APPLIED SETTINGS

SUZANNE GUERIN
BRENDAN ROONEY

Introduction

Research is a significant part of psychology, with the scientist-practitioner model being a key part of the discipline (Gelso, 1993). Landridge (2004, p. 4) defines research as “the systematic study of some topic in order to find answers to questions” and research in applied settings has numerous roles, including answering questions, informing practice and evaluating the impact of change. The growth of evidence-based practice (EBP) has increased the interest in research conducted in educational and health settings. EBP aims to bring together the knowledge or evidence gained from the process of systematic or scientific research and the process of decision making in practice (Sackett, Rosenberg, Muir Gray, Haynes & Richardson, 1996).

One of the strengths of research as a method of answering questions and informing practice is its focus on an empirical approach, one that is informed by gathering data on phenomena. This is in contrast to other methods of answering questions such as intuition, appealing to authority or logical argument (Hughes, 1999). However, it is important to recognise that these four methods of answering questions come together in the research process (see Figure 1).

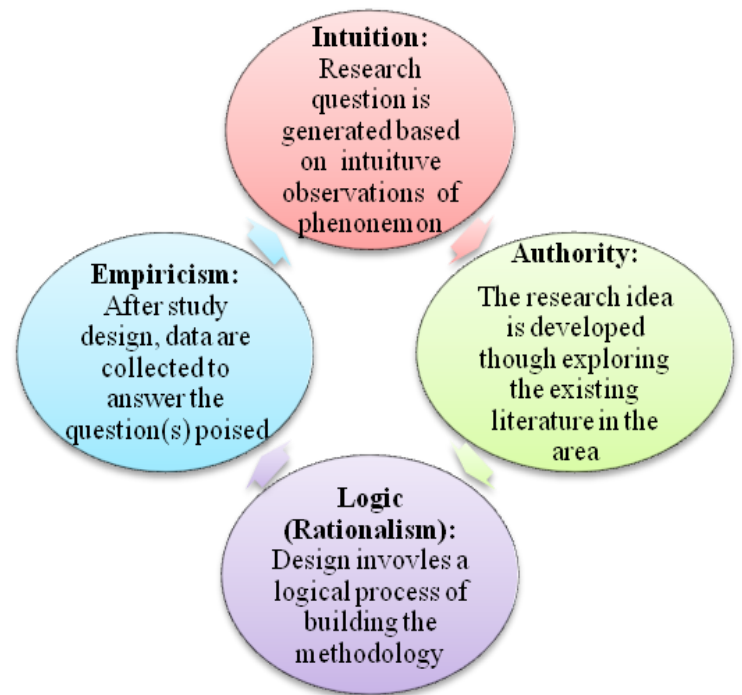


Figure 1. The interaction of intuition, authority, logic and empiricism in research.

Consider the example of a staff member in an intellectual disability organisation, who observes that service users’ behaviour appears to be influenced by levels of stress among the staff. In an effort to understand this issue she reviews the existing literature, identifies that variables such as stress and job satisfaction have been associated with behaviour, designs a study to be conducted within her organisation whereby data are gathered on key variables. The data are then analysed to identify any relationships between the variables. If a relationship is identified, this may provide staff with an insight into their understanding of service users’ behaviour.

Carlson, Martin and Buskist (2004) capture the research process in a little

more detail, as outlined in Figure 2 below. The development of the research questions in Phase 2 below maps on to the stage of consulting the literature (or appealing to authority) from the model presented in Figure 1. A central aspect of both models is that the process is continuous, and the outcomes of one research study (when disseminated) will drive further research in that area.

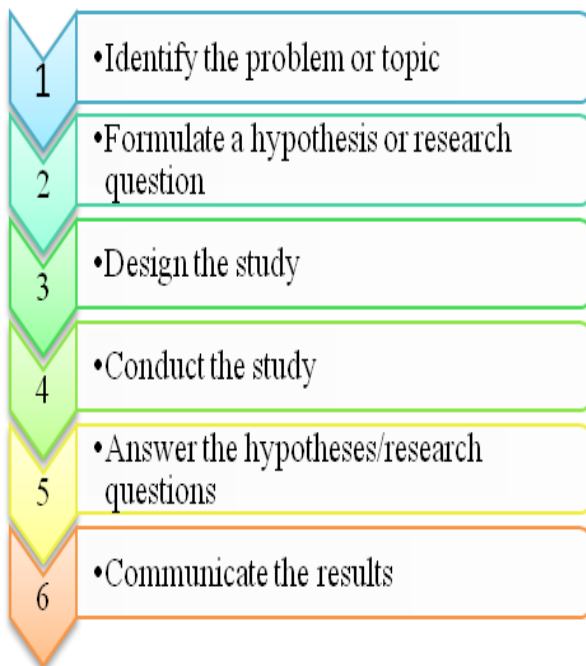


Figure 2. Flowchart of the general research process (Carlson et al., 2004).

The example above captures the stages of a typical research project in an applied setting. However research is not a unitary construct and instead is best considered as representing a continuum of practice that incorporates a range of qualitative, quantitative and mixed methods research approaches (Johnson, Onwuegbuzie, & Turner, 2007). Given that numerous text books have attempted to capture the nature of research methods in psychology and other health and social care professions this article will not attempt to capture the breadth of the area.

Therefore the focus of this piece is on the nature of quantitative research design, particularly the challenges that can arise for researchers using quantitative research design in applied settings and some possible solutions to these challenges.

Understanding Quantitative Research Design

One of the simplest definitions of quantitative research is offered by Landridge (2004, p. 13), who defines it as “research that concerns the quantity or measurement of some phenomenon.” A more developed definition is presented by Carlson et al. (2004) who defines it as “the methodological approach which regards human behaviour as measurable and subject to statistical analysis” (p. 815). Interestingly, in his book *Real World Research*, Colin Robson (2002) frames this approach as using fixed designs, stressing the structured and pre-set nature of this type of research.

The key characteristics of this approach includes that it aims to produce findings that are unaffected by external influences, that it is more concerned with being able to predict behaviours rather than simply describing them, and that it uses structured methods and experimentation. Quantitative research adopts a nomothetic approach to understanding, whereby the “objective is to establish broad generalisations and ‘universal laws’ that apply to a wide population of organisms” (Shaughnessy, Zeichmeister, & Zeichmeister, 2000, p. 21). Therefore a central feature is the extent to which findings from the research can be generalised to other groups. However conducting research

in an applied setting brings with it additional characteristics, including an emphasis on the real world which, according to Robson (2002) includes a focus on solving problems, an awareness of service users' needs, and dealing with time and cost constraints.

Taking these characteristics into consideration, the process of research design (whether qualitative, mixed methods or quantitative) involves making decisions about specific elements of the research process. The next section will consider some of these decisions along with the challenges (and related solutions) that researchers may face.

The Process of Quantitative Design

Individuals working in applied settings may choose to use quantitative research methods for a number of reasons. There is a view that quantitative research is more rigorous and valid than other methods, given its perception as scientific. Quantitative research is more prevalent in disciplines such as medicine, psychology and education (Alise & Teddlie, 2010) and anecdotally individuals are more likely to have been predominantly exposed to quantitative methods during their initial training, particularly those who have been working in applied settings for a number of years. Finally, there may be a dominant view within the setting itself (e.g., a health service) that quantitative research is more appropriate. However it is essential that the key driver in the design process is *the research question* posed by the researcher, rather than the service culture or the researcher's experience; when the question is

quantitative in nature a quantitative design will follow.

Having selected a quantitative approach, the researcher must make decisions about the specific elements of the research, and Figure 3 outlines the key elements to be considered. In order to effectively build the design, the researcher must reflect on how the research question influences choice in each of these areas. Also despite the focus of this article on quantitative research, there are many possible choices at each stage. In order to reflect on these choices, each of these stages will now be considered in turn.

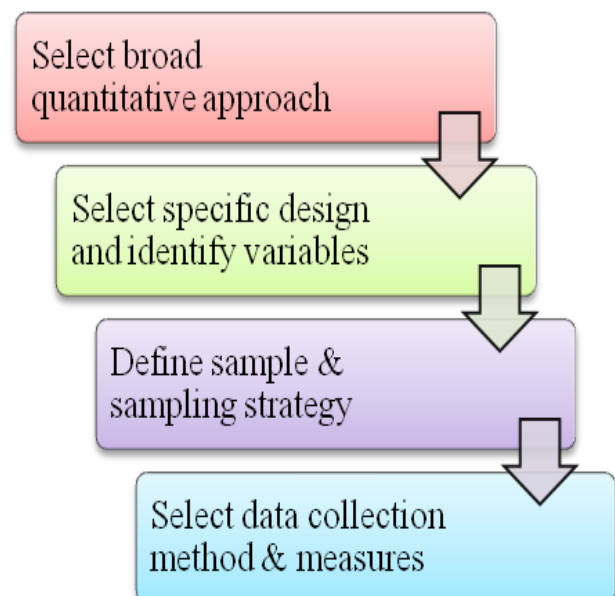


Figure 3. Stages of quantitative research design.

Selecting the broad quantitative approach

Quantitative research is often associated with the scientific or experimental method, which typically is seen to involve experiments conducted in laboratory settings (or otherwise controlled settings) whereby conditions are arranged or manipulated to examine the phenomenon the researcher is

interested in (Shaughnessy, Zechmeister & Zechmeister, 2009). However quantitative research is not limited to traditional experiments, particularly when the research is being conducted in an applied setting (or 'in the field'). In addition to experimental designs, quantitative research may include quasi-experimental designs where comparisons are conducted between naturally occurring groups or conditions (as opposed to artificially manipulated ones) and non-experimental designs, which include correlational and survey designs (see Shaughnessy et al. for a more detailed discussion of these broad approaches).

Pure experimental designs can be challenging to implement in an applied setting, and are more associated with initial laboratory testing. However the increased focus on evaluation in health and education has resulted in a growing interest in conducting randomised controlled trials in these contexts (Craig et al., 2008). A randomised controlled trial (RCT) is a design incorporating multiple conditions, sometimes called 'arms', which generally reflect different interventions or treatments. Participants are randomly assigned to one of these arms in order to test or compare the impact of the different conditions (treatments). The use of random assignment produces comparable groups, which allows the researcher to attribute any group differences to the treatments being compared, rather than any extraneous variables. However they are not without their challenges (see Clay, 2010) including in particular the ethical challenge of randomly assigning individuals in a service setting to treatment and no-treatment conditions

(Solomon, Cavanaugh & Draine, 2009).

Quasi-experimental designs can be applied more easily in applied settings as they do not require the same level of artificial manipulation. For example, a health researcher may compare outcomes for service users who receive two different treatments. However, rather than randomly assigning service users to receive either Treatment A or Treatment B, a quasi-experimental study would involve comparing groups who are receiving these treatments anyway. However, drawing a conclusion as to whether observed changes are due to a specific treatment is easier in experimental designs (such as RCTs) because the random assignment of individuals is assumed to balance any other factors that might have influenced the results in a quasi-experimental design (Shaughnessy et al., 2009). Despite these limitations the contribution of quasi-experimental designs in applied settings had been recognised with their inclusion in the overarching framework for the design and evaluation of complete health interventions recommended by the UK Medical Research Council and outlined by Campbell et al. (2000).

The differences between these two approaches often centre around the conflict between the ideas of internal validity and external validity. A highly controlled experiment that accurately establishes a causal effect between the treatment and the outcome is said to have high levels of internal validity. That is, there are few if any valid alternative explanations for the outcome. A potential problem with controlled experiments that have high internal validity is that they are not

often representative of the real world, where there is less control and the outcomes are open to extraneous influences. For example, a highly controlled RCT might administer a particular dose of a medication or intervention at the same time every day and measure the effect, whereas in the real world, perhaps it is less likely that a client will adhere to such a strict regime. On the other hand, when a research study seems to simulate a real world experience, it is said to have high levels of external validity. The problem with these studies is that they can often lack the high levels of control that feature true experiments, and so the exact cause of the outcomes of the research may be less clear. Thus, researchers working in an applied setting need to carefully consider the trade-off between achieving high levels of control and producing research that is relevant to a real world setting.

While there are pros and cons to choosing either experimental or quasi-experimental approach, non-experimental approaches are also common in applied settings. As mentioned above these may include correlational studies, which explore the relationships between key variables (such as in the example presented earlier), or survey designs, which aim to describe a particular phenomenon in detail. An example of a survey design may be a study that aims to identify the most common stressors reported by staff in a healthcare setting. Correlational designs are limited in their ability to determine if the relationships observed (e.g., between staff stress and service user behaviour) are causal and if so, which variable is the cause and which the effect. However, before conducting a

more experimental study, it is important to establish a correlation between the variables (Shaughnessy et al., 2009). Survey designs also do not aim to determine causal relationships, but their strength lies in the ability to gain an insight into a phenomenon by gathering data systematically on the issue (Langdridge & Haggard-Johnson, 2009). Again the researcher must return to the research question and reflect on what is being examined and use this to inform the choices being made.

Select a specific design

Within the framework of experimental, quasi-experimental and non-experimental approaches, a number of specific designs are available to researchers (see Shaughnessy et al., 2009). These are represented in Table 1 below. While correlational and survey designs are generally non-experimental, independent group (IGD), within group (WGD) designs and complex designs may be experimental or quasi-experimental, depending on whether the key variables are manipulated by the researcher (e.g., whether the participants are randomly assigned to a particular intervention or a control condition) or whether they are naturally occurring (e.g., comparing males and females, or people with mental health difficulties and those without).

Table 1. Common quantitative research designs.

Design	Key criteria	Common uses
Independent group/ Between group design	Separate groups are compared on key criteria.	Comparison of males and females.
Repeated measures/ Within group design	A single group is compared under different conditions.	Comparison of a group overtime
Complex design	Combines elements of both IGD and WGD	Examine changes overtime in groups receiving or not receiving
Correlational design	Examination of multiple variables within one group.	Examines relationships between factors within a group.
Survey design	Detailed examination of key criteria within a sample or	Large scale surveys.

In addition to the task of selecting a specific design, it is also important that the researcher is clear on the variables being examined. In the standard terminology, a dependent variable (often referred to as the DV) is generally the variable of interest and the researcher hopes to examine this variable under different conditions, within different groups, over time or in relation to other variables. An independent variable (commonly called the IV) is one which the researcher believes is influencing the dependent variable. For example, in a study where a researcher wants to compare

compliance with an exercise regime in men and women, the dependent variable is compliance and the independent variable is gender. Being able to name the key variables is central to selecting and naming your research design but it is also important to consider how these variables are operationalised. In the exercise example, compliance may be operationalised as the number of weekly sessions the participants have attended and this might be expressed as a proportion of the total number of sessions that should have been completed. It is important that the way in which a researcher defines the key variables within a study is grounded in previous literature, and this will support the validity of the study.

Define sample and sampling strategy

The majority of research is conducted with samples, which are selected to be representative of a population (Shaughnessy et al., 2009). A well-crafted research question will specify the population of interest, e.g., do adults with an intellectual disability (ID) who has lost a parent in the last 12 months show evidence of complicated grief? This question focuses on adults (i.e. those 18 years and older), who have received a diagnosis of an ID and who have experienced a parental bereavement within a defined timeframe. The specificity of the population can have implications for the process of selecting a sample – a broadly defined population can offer little guidance as to the process of findings potential participants, while a very narrowly defined population can be hard to find. With the example above a researcher accessing possible participants through a disability service provider will find it

relatively simple to identify whether a potential participant has lost a parent, but if the sample were required to have a very particular type of disability this would limit the potential participants and may make it difficult to secure an adequate sample.

Whatever the nature of the population, a key aspect of quantitative research is the process of selecting the sample. Random selection would be seen as a gold standard (Shaughnessy et al., 2009) as it would be assumed that the randomness of the process would control for possible biases or systematic deviation in the sample. However the voluntary nature of research participation can undermine a random sample or indeed, random selection may not even be feasible in an applied setting, for example where an exhaustive and reliably list of the population (the sampling frame) is not available. Robson (2002) discusses a variety of sampling methods, including techniques based on random and non-random processes. Within applied settings, there are practices that can assist with sampling, such as the use of large, organisational databases to assist with sample selection. A well-developed database offers the potential for a stratified random sample, while service units may offer meaningful clusters within which to sample.

Whatever sampling method is used, it is important that the researcher is aware of the strengths and limitations of the final sample (e.g., high levels of people declining to participate), and considers these when extrapolating the findings. Likely limitations include the possibility that units represent biased clusters, or poor administration of databases undermining the extent

to which they accurately represent the population within the organisation. There is also the need to recognise that single setting studies (e.g., those conducted in only one organisation) may not represent the broader population if there is a reason to expect that the organisation is not typical of others in the wider area. For example a disability service with a strong social-model orientation may not represent a more medically-oriented service. Despite these limitations, applied settings still offer opportunities to develop studies that can provide insights beyond the boundaries of an individual organisation.

Select data collection methods and measures

Having decided on the design of your study and the target population and sampling methods, the next key area is the selection of data collection methods and specific measures. In quantitative research there are many methods of collecting data including gathering biomarkers (e.g., saliva, blood pressure, etc.), behavioural measures (e.g., counts of target behaviours, time spent involved in particular activities) and most notably, self- and informant-report measures. Clearly this is something that is dependent on the population, particularly in terms of issues such as literacy, communicative ability, etc. However the area of quantitative data collection and particular measures can be further complicated.

The first complication is the language used. Langdridge and Haggart-Johnson (2009) note that self-report and informant measures (which they refer to as questionnaires) are methods of systematically gathering

information in applied areas. When discussing text-based self-report and informant measures, a wide range of terms are used including surveys, questionnaires, scales, tests, and measures. However there is an important distinction to be made. While some of these techniques aim to systematically gather information, others have a more structured intention to measure a particular construct. Consider the Census; the aim of this tool is to gather population-based information on demographic profile (age, gender, occupation, etc.). In contrast, consider a typical research measure, the Beck Depression Inventory (Beck, 1961); the aim of this tool is to capture a valid and reliable measurement of depression-related symptoms, and this is where the distinction is to be made. Some tools simply aim to gather information, others aim to measure. It may be helpful to think of the first as surveys and the second as questionnaires or scales.

Even with a (nominally) agreed language, there are some points to remember about using these tools. As already mentioned, the population of interest will determine what is appropriate in terms of relevance and accessibility. The selection of appropriate measures will also be influenced by the way in which the researcher defines his or her key variables, as the measures will need to reflect the variables as they have been defined. In selecting measures, it is essential that researchers consider the validity and reliability of the tools. In the case of scales and questionnaires, Vogt and Johnson (2011) define validity as “the degree to which an instrument or test accurately measures what it is supposed to measure” (p.

415), while reliability is “the consistency or stability of a measure or test or observation internally from one use to the next” (p. 336). This information is generally available in the manual for the instrument or in previously published articles. However, it is important that there is evidence that these criteria are met, and that evidence exists for their use with the target population, particularly with any standardised or diagnostic instruments. Issues of reliability and validity also hold for more survey-based measures. However, this is generally driven by evidence of the suitability of the language and structures used, rather than statistical checks.

Robson (2002) presents a detailed consideration of issues in using these quantitative data collection techniques. These tools are very flexible in that they can be used as both self- and informant-report. In addition, valid and reliable measures exist in the research literature for a huge range of concepts, behaviours and experiences relevant to applied research. Appropriately designed or adapted these tools can be used for most groups of participants, and they are flexible in terms of delivery, with options for postal surveys, group completion, online presentation and use in the context of a structured interview. However as with many methods, there is the scope for bias and contamination, and particular challenges include unclear language, low response rates and inappropriate use of these tools (e.g. using tools designed for adolescents with younger children within validation). Nevertheless, when these methods are used on the basis of strong evidence for their suitability with the target

population, and in the context of the research question, they can be a very effective tool for data collection.

A note on using online methods

The Internet provides researchers with increasing efficiency of data collection and researchers are improving their online data collection skills, Internet research is becoming more and more commonplace (Denissen, Neumann & van Zalk, 2010). While much of the research exploring features of online data collection methods suggest that the advantages (efficiency and flexibility) outweigh the challenges (data quality issues, dropout), researchers need to give careful consideration to the way in which they design online research, if they are to obtain high quality data from appropriate samples of individuals (Rooney, in press). In addition, the use of online research methods, requires additional ethical considerations if the principles of ethical research are to be maintained. (See Hewson, 2003 for helpful, open access and comprehensive resource on conducting research online including some associated ethical issues). Nevertheless techniques such as online surveys are becoming more common in health settings and more acceptable also, with increased familiarity with the online environment among service users and staff.

Final Thoughts

This article has attempted to capture some of the key stages of the quantitative research design and implementation process, with a particular emphasis on the applied setting. Quantitative research has a rich tradition in psychology and the health and social sciences, and there is no doubt that it has significant

potential to assist psychologists and other health and social care professionals doing research in applied settings to systematically address key questions. However, as with any technique, there are potential challenges. In order to respond effectively to these challenges, research must be carefully planned in advance, with due consideration given to the design, sample and measures used in the research, and the choices made in these areas must balance the evidence from previous research and the specific nature of the context in which the research is done.

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HOW TO ENGAGE WITH STAKEHOLDERS THROUGH QUALITATIVE RESEARCH

MANDY S. LEE

Introduction

This article provides an overview of qualitative research, focusing on key methods and approaches that would be useful for conducting exploratory investigations into service delivery and organisation in health and social care. We start with a discussion of the rationale for conducting qualitative research in health and social care, and proceed to cover two data collection methods most used in qualitative studies: interviews and focus groups. In addition to providing practical tips on how to collect data using these two methods, the discussion will centre on the theoretical and practical considerations that need to be taken into account when choosing between qualitative methods and approaches for one's research project. Several qualitative research studies in health and social care will be discussed as examples to illustrate how such approaches contribute to our understanding on issues relevant to health and social care professionals in both policy and practice.

Why Qualitative Research?

In a previous chapter, we have looked at a variety of research questions that are relevant to health and social care professionals seeking to improve policy and practice. Often, research problems

that require exploration rather than evaluation are more amenable to be investigated through participant-led, qualitative approaches; and such problems are often found at the beginning of a research cycle, when issues remain ill-defined, or when their parameters and terms of references are being contested by different stakeholder groups. A key criterion for methodological rigour is that the research design should match the nature of the research problem being investigated. When the causes and conditions that result in the observed phenomenon remain little known, or must be understood in the local context at the micro or meso levels, qualitative investigations can generate insights that have a real impact on the successful development and implementation of policy and practice: Qualitative design can lead us to underlying behaviours, attitudes and perceptions that underline health outcomes; it can help us explain social and programmatic impediments to informed choice or the use of services; it can shed light on the success of our interventions; it can facilitate better understanding of the policy, social and legal contexts in which health choices are made (Ulin et al., 2005, p.xix).

Underpinning the above contributions of qualitative research is the focus on *meanings* rather than measurement as the ultimate goal in some research investigations, either because it is not yet possible to devise appropriate measurements for the phenomenon as so little is yet known about it, and/or because it is actually not desirable to stop only at objective measures and ignore the subjective and contextual information that are also needed to arrive at an informed understanding of

the issues at the local level. Qualitative research contributes to our understanding of healthcare problems because it “emphasizes *depth* more than breadth, *insight* rather than generalisation, illuminating the *meaning* of human behaviour.” (Ulin et al., 2005, p.54, emphases added).

Meanings become the focus of qualitative research because qualitative studies are primarily based on an *interpretivist* research paradigm (Gubrium & Holstein, 2003). Management scholars have long argued that investigations into organisations and organising processes must be based on recognition that these are not closed, mechanical systems operating in a stable vacuum, but rather open, *interpretive* systems operating in complex, changing environments (Aldrich, 1979; Daft & Weick, 1985; Hasselbladh & Kallinikos, 2000; Hatch & Yanow, 2003; Kohn, 2000). Based on a conception of organisations as composing of reflexive individuals who are agents of their own action, rather than as robotic automatons merely performing assigned functions, individuals’ interpretations and the meanings they hold of their social world are therefore seen as foundational blocks of organisational action⁹ (Blumer, 1969

[1998]; Giddens, 1984; Thompson, 1967). As the sociologist Herbert Blumer pointed out: “[Interpretation] should not be regarded as a mere automatic application of established meanings but as a formative process in which meanings are used and revised as instruments for the guidance and formation of action” (Blumer, 1969 [1998], p.5).

In the healthcare literature, there is an additional recognition that qualitative insights are crucial to ensuring the ethic of care and compassion remains current in an era of evidence-based medicine (Lawrence & Maitlis, forthcoming; Tucker, 1997; Tschudin, 2000; Grypdonck, 2006). Effective clinical knowledge itself “consists of interpretive action and interaction—factors that involve communication, opinions, and experiences” (Malterud, 2001, p.397), and effective clinical practice relies on a narrative approach that resists reducing patients to impersonal clinical data, but recognising and restoring patients as people (Hurwitz, 2000).

Whilst data from randomised control trials provide robust measurements that establish the relationship between treatment and effects, they are however unable to answer questions that relate to differences in values and goals (Grypdonck, 2006), such as the disparity in clinical foci and objectives amongst health and social care professionals, or the differing priorities between patients and their carers. Instead of ignoring or dismissing these difficult, value- and meaning-laden questions as being irrelevant to an evidence-based healthcare system,

⁹ Stanovich’s (2011) work on the debate between rationality and irrationality as the basis for human action and scientific knowledge is very pertinent here. Neither the ‘panglossian’ (‘humans are inherently rational who react rationally to objective conditions most of the time’) nor ‘apologetic’ (‘humans are inherently irrational who mostly act according to heuristics and biases’) responses are appropriate for the building of scientific knowledge about human action. But the ‘meliorist’ response, which acknowledges that neither rationality nor irrationality is an *essential* human condition, but that education and information can improve reasoning in human endeavours, can be a viable

basis for the pursuit of scientific knowledge about human action.

they should be appropriately and rigorously investigated using qualitative research approaches.

The search for meaning in organisation studies is also due to the recognition that healthcare organisations, like other human systems, are complex adaptive systems (Begum, Zimmerman & Dooley, 2003; Brown & Eisenhardt, 1997; Plsek & Greenhalgh, 2001; Plsek & Wilson, 2001). Whilst a merely complicated system can be understood by breaking it up into component parts and examining each part separately as one would a mechanical object, requiring only *aggregative* knowledge; a complex system is composed of interacting units such that 'the sum is more than the parts', with emergent system behaviours that cannot be studied in isolation from the interacting agents, and which require holistic, *integrative* knowledge. Specialisation and the creation of hierarchies of knowledge in a complex system could thus lead to partial and even misleading understanding of the phenomenon. In the worst cases, such specialisms create 'apartheids of knowledge', so that an integrative understanding of the whole – be it at the individual, group or system level – becomes near impossible. The danger could become so acute that one might end up inadvertently "cutting the patient to pieces" (Bauman et al., 1998; Tucker, 1997) according to one's disciplinary training, and creating a health system riven with fragmentation where 'joined-up' thinking and working seldom occur (Department of Health & Children, 2001; World Health Organisation, 1996). By seeking to understand how diverse organisational stakeholders socially construct the worlds in which they act and interact (Astley, 1985;

Bryant, 2006; Gibson & Zellmer-Bruhn, 2001; Green, Li & Nohria, 2009; Suddaby & Greenwood, 2005), qualitative research can generate integrative, cross-disciplinary knowledge seldom possible in other research designs (Malterud, 2001). Sorensen and Iedema's (2009) study is an example of such integrative knowledge made possible in healthcare management research using qualitative methods. Using a multi-method qualitative design that included open-ended interviews with clinical doctors and managers, and focus group research with nurses, they illuminate the 'professional fractures' that exist between medics and nurses in their care-giving roles and their differing responses to the challenges posed by the emotional labour in their daily work with patients.

Qualitative research is, however, a very broad label applied to a number of social science research methodologies where textual data are collected and analysed. I will only have space here to cover a couple of key qualitative research methods in a practical manner. Whilst I cannot delve into the theory and philosophy behind key traditions of qualitative inquiry in this paper, I must mention the strong link that exists between standard qualitative research approaches and action research (in fact, action research is often considered as part of the family of qualitative methodologies alongside others such as ethnography and phenomenology)¹⁰.

¹⁰ Carter and Little (2007) identified five methodological traditions or 'strategies of inquiry' under the broad label of qualitative research. They are, in summary: (i) grounded theory approaches; (ii) life-history or narrative approaches; (iii) ethnographic approaches; (iv)

Organisation development scholars have long argued that the asking of open questions – the essence of a qualitative research inquiry – may by itself constitute an organisational intervention, in that it allows members to think and reflect on an issue without prejudice and in a non-threatening context, something they may not have otherwise been asked to do in the course of their organisational life. And thinking and reflecting – particularly of the depth that qualitative research requires – are themselves the germ of organisational change.

Thus, even a standard qualitative research project, when properly conceived and executed, can help to engender change by bringing into open hitherto tacit assumptions and neglected stakeholder voices, fulfilling an emancipatory purpose not possible with research designs that are oriented towards measurement rather than meaning (Bryant, 2006). As such, although qualitative research has often been disparaged as the production of long-winded descriptive accounts dressed up with fanciful words, its value and usefulness in enabling meaningful stakeholder engagement must not be overlooked (Medical Research Charities Group, 2014). As a public health journal editor commented about the value of

participative action approaches; and (v) case study approaches. Each of these have their own distinctive line of inquiry and knowledge claims, which filters through to the way data are collected, analysed, and presented. Although it is beyond the scope of this paper to discuss the epistemological bases of these different methodologies, readers are directed to the 'further reading' list at the end of this article for a number of resources that provide guidance on the key qualitative methodologies.

qualitative research in the context of service development:

[Our] editorial policy is to appreciate *research that is linked to action*, that is, in which the results of the study are used to benefit the participants and others in similar circumstances and not research done for its own sake or to benefit mainly the researchers. *A research team may not be in a position itself to carry out an action component, but it can work with others who can.* (Berer, 2005, p.194, emphasis added).

Qualitative Data Collection Methods

The quest for meaning rather than measurement has direct implications for how we collect data in qualitative studies. Typically, qualitative researchers endeavour to shape their investigations to include the following:

- Local, contextual information – In contrast to “context-independent” population-level measures used in quantitative research, qualitative researchers are predominantly interested in understanding local *cases* rather than the population as a whole. As such, local contextual information is always included in case descriptions, as an aid for better interpretations of participants’ meanings uncovered through the course of research.
- Valued perspectives from multiple stakeholders – In contrast to quantitative research that subscribes to a “value-free” research paradigm seeking to minimise bias, qualitative researcher recognise that subjective biases – or in other words, valued rather than neutral perspectives – are the key to understanding the social meanings

held, shared and/or contested by individuals and groups. Qualitative researchers seek to understand rather than minimise biases, and use them as a resource to arrive at a polyvalent interpretation of the issue, by making explicit tacit assumptions held by diverse stakeholders.

- Open-ended, participant-led inquiry – In contrast to researcher-predefined, closed questions used in measurement-based research, qualitative research allows participants to share their experiences and viewpoints in their own words through open-ended questioning, rather than requiring them to fit their narratives within the strict conceptual schema predefined by researchers based on extant literature. More often than not, the direction of research inquiry itself is led by participants rather than predetermined by the researcher, due to the recognition that participants are experts in their own right regarding their own circumstances, as they are the persons who have first-hand experience of the phenomenon rather than the researchers themselves. The research objectives are therefore defined jointly with participants, whose ‘insider knowledge’ (Coghlan & Brannick, 2009) is considered a valuable resource in determining which issues and questions are considered important to address. In the context of health services, qualitative research was instrumental in contributing to our understanding of patients’ self management of diseases and to helping us move towards recognition of patients as “experts” especially in regard to chronic

illnesses (Charmaz, 2000; Clark & Gong, 2000; Coulter & Fitzpatrick, 2000; Deyo, 2001; Emanuel & Emanuel, 1992).

Several data collection methods are strongly associated with qualitative research precisely because they allow investigators to gather data that fulfil the above research requirements. The two key methods I will cover here are interviews and focus groups. Within each method, there are different approaches a researcher could use depending on particular theoretical, ethical and practical concerns. I will discuss the general rationale for choosing one approach versus another, in the hope that readers may find it easier to discriminate between different approaches when it comes to designing their own research inquiry¹¹.

Interviews

Interviews are the most commonly-used data collection method in qualitative research, whereby the researcher conducts a dialogue with selected participants, often on a one-to-one basis, on a chosen topic of research interest. The difference between an interview and a normal conversation is that the direction of dialogue is mindfully guided by the investigator in accordance with specific research objectives, either with explicit, ordered questions, as in a structured interview; or with assurances and prompts, as in an unstructured interview. Most often,

¹¹ Although space will not permit me to cover issues of sampling and data analysis here, it is widely recognised that “the separation between ‘sampling’, ‘data collection’, ‘data analysis’, ‘interpretation’ and ‘presentation of findings’ is rarely clear, nor necessarily desirable in qualitative studies” (Fulop et al., 2001, p.203).

qualitative research interviews are conducted in a semi-structured manner, with pre-ordering of topics and key questions prepared by the researcher before the interview, but allowing the researcher and the participant flexibility on the ordering of the actual questions in the flow of dialogue, and the opportunity to expand on certain topics as deemed appropriate by the researcher in the course of the interview.

Common to all qualitative interviews, whether structured, unstructured, or semi-structured, is the predominant use of open-ended, rather than closed questions. Even in a highly structured interview where the researcher is required to stick religiously to the prepared protocol in terms of question order and the exact question phrasing (and indeed acceptable re-phrasings of key terms are often thought of beforehand by the researcher and included in the interview guide), participants are still required to formulate their responses in their own words, rather than use a 'tick-box' approach as in a questionnaire survey. Structured interviews are typically used in the context of an interview survey, where research objectives call for population-level explanations. The questions remain open-ended, allowing participants to relate their views and experiences in their own words; however, the manner in which questions are asked are kept consistent across all sampled individuals. See Boxes 1 and 2 for more information on interview surveys.

In unstructured interviews, the questions themselves become more free-form, such that they are more often assurances, probes and prompts, rather than actual questions per se.

In-depth, unstructured interviews are typically used in phenomenological research, which focuses on the lived experiences of the research participants who have first-hand knowledge of the phenomenon of interest. The job of the researchers in this instance is to enable participants to articulate and share their views and experiences, thus the interview is led by the participant's narrative rather than predetermined by researcher questions. Researchers conducting unstructured interviews will typically start the discussion with a very open-ended question, usually on an easily describable part of the experience, as a way to help the participant to 'open up'. Rather than relying on a prepared script to interview participants, researchers conducting unstructured interviews will use several elicitation strategies to obtain relevant research information, depending on the way participants tell their stories in the course of the interview. Such elicitation strategies typically fall under the categories of assurances, probes, and prompts:

(a) Assurances – In enabling participants to share experiences, the key thing a researcher needs to do is to assure or reassure the participant that s/he has a sympathetic ear, which is best communicated not in the form of a question, but by a sympathetic, non-judgemental comment (e.g. 'Yes that must be very hard indeed', 'I know what you mean', 'Yes I see where you're coming from', etc.), or by simply re-stating a previous comment made by the participant to encourage him/her to share further (e.g. 'So you were told to come to the appointment on Thursday and didn't get to see anyone...'; 'You were saying they asked you about that question in front

of everyone...’, etc.). The latter strategy has the added benefit of making the participants aware that they were being listened to, and offers the researcher also an opportunity to double-check whether s/he has understood the participants correctly on their own terms. Rather than firing one question after another in a mechanical manner, (re)assuring comments are also more effective in enabling people to feel comfortable and valued enough to want to share their views and experiences with the researcher, who is often a stranger to the participant and needs to build up rapport with the interviewees to elicit story-telling relevant to the research objectives.

(b) Probes – Although unstructured interviews are participant-driven in terms of narrative, it does not mean that the researcher gives up totally his/her role in guiding the conversation. Experiences are multi-faceted and some aspects of participants’ experiences are more relevant to the goals of a particular research study than others, and the researcher’s job is to remain vigilant to those aspects of a participant’s narrative that are more revealing about the phenomenon under investigation, and to probe further into those areas to elicit a fuller, richer description from participants. The researcher can do this by asking the participant to clarify certain aspects of his/her views and experiences (e.g. ‘Can you explain a bit more to me what happens when...’), or by paraphrasing the related experience in the researcher’s own words, not only to check if the researcher’s interpretation is correct, but also to tease out a fuller account of those aspects of a phenomenon that are of

research interest (e.g. ‘So if I understood you correctly, you are required to do XYZ when ABC comes? Is that always the case?’). Direct questions may be used to open up a topic area for discussion, but it is the reassuring comments and probes which do the bulk of the ‘questioning’ work in unstructured and semi-structured interviews in helping participants articulate their own experiences.

(c) Prompts – Sometimes, neither (re)assurances nor probes are able to get at those aspects of experience that are of research interest to the investigator, perhaps because the participant feels a little awkward in raising those issues freely with a stranger; or because the participant goes off on unrelated tangents during the interview. In such cases, qualitative researchers may use prompts to ensure that a proper research interview can still get off the ground and/or stay on track.

There are ways in which a participant can be prompted to share their experiences without asking leading questions, such as by stating what has been known about the phenomenon so far, and asking the participant if these actually reflect their own experiences. One can also draw the participant’s attention to other aspects of an issue that has yet to be mentioned by him/her, but which has been reported or theorised elsewhere, and asking if they are relevant to his/her own experience. Crucially, prompts differ from leading questions in that they should only be included only after the researcher has asked an open-ended, neutral question, and whenever they are used, the researcher should make clear to the participant that the

prompted ideas could be contested as well as agreed with (e.g. ‘You mentioned ABC, what about XYZ, does the latter has any relevance at all from your point of view? Or maybe it’s not something you would consider?’)

Prompts can also take the form of hypothetical questions to clarify underlying mechanisms or processes, once the participant has given a basic picture of their own experience (e.g. ‘So what will happen when a person do ABC instead of XYZ?’). The purpose of prompts is to help the researcher reveal any potential blind-spots or knowledge gaps that might exist in individual participants’ conceptions of the issue, a function of the disciplinary and/or positional constraints that necessarily limit each individual’s understanding of the issue as a whole.

By using assurances, probes and prompts judiciously in semi-structured or unstructured interviews, qualitative researchers can uncover the limits of an individual’s bounded rationality (Simon, 1976; Weick, 2001), and even bounded emotionality (Mumby & Putnam, 1992; Thagard, 2007), which help to generate an overall integrative understanding of the issues from participants’ experiential standpoints. One study that employed the interview method to great effect is a piece of research conducted with parents and children on their views regarding the children’s quality of life after a heart transplant (Green et al., 2009). The researchers developed separate interview guides for parents and children, and interviewed them individually at a time and location chosen by the participant, usually at the participant’s home or in a private location at the hospital. Children’s interviews “were initiated by asking

them to draw a picture of themselves on a good day to establish rapport and facilitate a more natural conversational flow” (Green et al., 2009, p.50); and interviews were conducted on a semi-structured basis that “allowed [participants] to tell their stories in the manner they chose” (Green et al., 2009, p.50).

The parents’ interview guide consists of a handful of open-ended, ‘lead-in’ questions of the ‘Tell me about your experience of X’ variety, which were enough to enable the researchers to conduct interviews that lasted between 1.5 to 2 hours, eliciting in-depth qualitative data that illuminate parents’ and children’s experiences post heart transplant operation. As we have previously discussed, in semi-structured and un-structured, in-depth interviews, it is assurances, probes and prompts, rather than questions per se, that are most helpful in enabling participants to share their experiences with the investigator. Such rich data focusing on individual experiences would not have been as easily elicited using measurement-based methods based on researcher-predefined response categories.

Box 1. Interview Survey vs. Questionnaire Survey**Question:**

How does an interview survey differ from a questionnaire survey?

Answer:

Surveys seek to generate comparable data across individuals in a population. Most often, in order for comparisons to be objective, questionnaires are used, which is an instrument comprising mainly of closed questions – i.e. where responses to questions are pre-formulated by the researchers and the participants simply respond to the choices available (thus the people who take part in these studies are correctly labelled as ‘respondents’). The measures are specifically designed and validated to allow for robust, objective comparisons to be made across the whole population of interest.

However, sometimes researchers interested in systematic comparisons do not wish to prejudge what the participants’ responses are going to be, and/or they want to get more nuanced information from the participants than a mere tick-box approach would allow. In such cases, an interview survey might be used, where highly structured interviews – i.e. interviews with a strict question order, and strict question phrasing – will be conducted that allow participants to answer questions in their own words, but where there is no deviation whatsoever in *how* the participants are asked from person to person, as the research objective remains the systematic comparison of cases across the whole population. Although sometimes a semi-structured interview format is used for interview surveys, strictly speaking this should be frowned upon as this dilutes further the basis for systematic comparisons across the whole population. The word “survey” should only be used when one is clearly interested in generating explanations at the population level, and should not be abused as a catch-all term to describe any kind of data collection.

Box 2. Interview Survey vs. Interviewer-Administered Questionnaire Survey**Question:**

I had an interviewer knocked on my door with a questionnaire and went through a survey with me verbally, was that not an interview? I was being interviewed, wasn't I?

Answer:

In that scenario, you were not taking part in an interview with the researcher, but rather verbally completed a questionnaire administered by the researcher. If an interviewer went through a questionnaire with you, whereby you were asked to respond primarily to closed questions, e.g. to pick one or several choices from a check-list of options called out to you; to say you ‘strongly agree’, ‘agree’, ‘disagree’, or ‘strongly disagree’ with certain statements; to indicate on a scale from 1 to any number on your perceptions or beliefs on certain issues, etc., then strictly speaking, you were not involved in a research interview but a ‘spoken’ questionnaire. If your ‘interview’ consists primarily of you responding to predefined choices put to you (with the ability to indicate ‘other’ and elaborate only as an extra option), rather than to talk freely about your views and experiences in your own words, then you were simply given a questionnaire survey verbally. Telephone surveys using questionnaires are therefore not “interview surveys” *per se*, even though they might be colloquially referred to as such. They are still questionnaire surveys, albeit administered by trained operators over the telephone, rather than paper questionnaires sent to the public for completion themselves. The term ‘interview’ should be used only when the data collection consists primarily of open-ended questions; and the term ‘questionnaire’ should not be used as a catch-all term to refer to any research instrument. Open-ended questions prepared in advance by the qualitative researcher to guide his/her research interviews should be referred to as ‘interview protocol’, ‘interview guide’, or ‘interview schedule’.

Another study, this time on the meaning of professional practice for occupational therapists, similarly employed semi-structured interviews, as the research objectives called for flexibility and open-endedness to allow participants to articulate different dimensions and 'modes of being' in their professional role. Focusing on the lived experiences of the participants, Smith and Kinsella (2009) developed an interview guide "through an iterative process that drew on a review of the literature, reflection on the key questions of the study, and Wilcock's (1998) framework of being, doing, becoming, and belonging" (Smith & Kinsella, 2009, p.301).

Similar to the children's quality of life study, Smith and Kinsella (2009) prepared only a handful of open-ended questions under each mode of experience for their interviews with occupational therapists. In addition to asking about participants' direct experiences (the 'best' and 'worst' examples of X, etc.), the researchers also asked questions about the participants' ideal work environment, to better interpret the values that individual participants put on different aspects of their professional life. Like other studies that employed the semi-structured format, participants "were informed that they were free to discuss ideas and situations beyond those initiated by the interview questions" (Smith & Kinsella, 2009). Whilst these studies cannot and do not claim to provide data that would be generalisable beyond their study settings, nevertheless they provide important insights into the experiences of patients and healthcare professionals that are useful to the development of local policies and practices in enhancing patient-

centredness or professional support, and may also be *transferable* to other contexts in which the described experiences found resonances in others' circumstances. At a minimum, such qualitative accounts sensitise readers to the existence of differing viewpoints and experiences that might not have otherwise surfaced and given voice if not for such qualitative investigations.

Focus Groups

Another key data collection method employed by many qualitative researchers is the focus group, which refers to group discussion sessions facilitated by the researcher on a topic of research interest. Focus groups should be distinguished from group interviews because the latter posits an interaction that is still primarily between the researcher and the interviewee, even if these individual participants now sit in a group rather than talk to the researcher on a one-to-one basis. Focus group discussions, on the other hand, are discussions primarily held *between participants*, with the researcher acting merely as the discussion leader-facilitator-moderator. In fact, a focus group discussion is often deemed to have failed if it degenerates into merely a dialogue between the researcher and individual participants, rather than as a multi-voiced discussion with focus group participants building on and responding to each other's contributions.

As such, focus group discussions can never be highly structured, but should be facilitated to encourage a free flow of exchanges amongst participants. There are primarily two types of sampling of focus group participants,

viz. homogeneous sampling, which is used to recruit participants with similar backgrounds to encourage group sharing of experiences (similar to what happens in patient or peer support groups); and heterogeneous sampling, which is used to recruit participants from diverse backgrounds, for the purpose of gauging their differing perspectives on a common issue. As the data collection involves a group of participants rather than just one person, researchers using the focus group method have a lot more to consider, from the selection of venue to seating plan to the actual management of discussions.

The first consideration for a focus group researcher is to ensure accessibility of the venue to all participants, as well as to ensure that the venue is considered neutral ground as far as practicable for all participants concerned, especially when recruiting heterogeneous members into a focus group discussion. The room must be considered private and neutral enough for all participants to feel comfortable conversing on the topic(s) of interest. It is prudent to invite a couple more people than is strictly required, due to the fact that there will always be last-minute drop-outs, and the researcher needs to ensure that, on the day of the focus group research, there is a critical mass in the number of participants to enable a viable discussion amongst group participants.

To enable optimal discussion amongst group members, focus group researchers also spend time thinking through the seating plan. Beyond simply organising circular or semi-circular seating to ensure direct eye-lines amongst all participants, researchers also try to enable

maximum discussion amongst a group of relative strangers by judicious planning of seating arrangements. If there are focus group members who are already known to, and friendly with, each other, they should be asked to sit across from each other and dispersed across the seating plan, so that individuals' contributions, which are usually directed towards a friendly face, will be directed at and heard by all focus group members, rather than only to their seatmates.

The focus group discussion guide itself should not be conceived of as simply an interview guide multiplied by X number of people. It should provide guidance not only on the desired topics of discussion, but also on the elicitation of group responses, including initiation and transitioning prompts, and the points at which the researcher hopes to gauge consensus or dissensus (i.e. diversity of views and perspectives) from the group. In addition to using open-ended questions, sometimes researchers may use a vignette describing an archetypal aspect of the experience to get the conversation going amongst focus group participants, usually in the form of a short video or a short pamphlet that the participants may view or read prior to the start of a focus group discussion. For heterogeneous focus groups convened for the purpose of arriving at some consensus on a topic amongst diverse group members, researchers may also initiate discussions by presenting some basic data on the topic for group reflection.

The focus group session is at a minimum audio-recorded if not video-recorded, and the facilitator is usually supported by at least one other scribe or note-taker, who takes an observing

role during the session to help record the interactions amongst participants. For ease of audio-transcribing as well as for getting the group acquainted with each other, usually participants would be asked to introduce themselves briefly at the beginning of a focus group session, which means that subsequent contributions by individuals can be adequately identified from the audio record. At the end of the focus group discussion, a debriefing session amongst the research team can be held on the contributions that were made by the participants and the way the discussion was handled, which would help to yield not only the first sensitising categories for later interpretations and analysis of data, but could also help the facilitator to fine-tune the prompts and questions used to manage the discussion for subsequent focus group sessions, as part of a grounded theory strategy in ongoing data collection (Encandela et al., 2003, p.421).

Whilst the above are tips on the practicalities of organising interviews and focus groups for qualitative research purposes, researchers must first clearly identify the purpose for which they are using these as methods of data collection. As already stated in a previous chapter, research designs must be matched to particular research questions. Qualitative research, as we have seen, is suited to exploratory investigations that focus on the meanings held, shared, and/or contested by individuals and groups of organisational stakeholders. However, methods suited to exploring meanings should not be employed to gauge measurement. A research scientist working for the World Health Organisation's Special Programme of

Research, Development and Research Training in Human Reproduction (HRP) had commented on the research proposals he reviewed over the decades that contain qualitative elements:

The single fatal flaw in any proposal is to set forth incorrect research methods to meet the stated objectives. We have received submissions proposing the use of FGDs [focus group discussions] to measure the prevalence and incidence of contraceptive use or violence... These proposals were not approved because FGDs are not suitable to measure prevalence or incidence. On the other hand, proposals that have suggested using FGDs to ascertain normative patterns, to develop a survey instrument, or to explain or expand on survey findings have frequently been approved. Also reviewed favourably are FGD proposals to understand community norms and attitudes towards specific reproductive health issues (Shah, 2005, p.64).

Within the spectrum of qualitative research methods, focus group discussions are indeed particularly suited to investigating *social*, as opposed to personal, meanings. Instead of the researcher interviewing participants individually and then analysing their collective responses based on the researcher's own interpretations, focus groups allow comparisons across individual viewpoints to be made by participants themselves, which happen organically in the course of the group discussion. By giving space to participants to juxtapose their views and experiences with each other in real time, focus

groups have an advantage over interviews when researching into issues that require the comparison and contrast of multiple stakeholder perspectives.

A focus group study that has successfully utilised the method to investigate social meanings held by diverse participants in the context of healthcare is conducted by Encandela and his colleagues (2003) on exploring mental health management of people with severe mental illness (SMI) for HIV/AIDS prevention. Target participants were all case managers drawn from agencies within a 15-county region of western Pennsylvania, but they were purposively sampled for the focus group sessions "to ensure a mix of ICMs [Intensive Case Managers] and RCs [Resource Coordinators] from rural, small-town, and urban communities, as well as women, men, and racial minorities" (Encandela et al., 2003, p.420). The sessions were deliberately held "away from case managers' work sites" to ensure a degree of privacy and comfort for participants to share their views and experiences relating to their role in providing behavioural support to people with SMI in the context of HIV-prevention. The only exception "involved a rural, hard-to-reach location, where the focus group met within the agency after work hours and consisted of a mix of ICMs and RCs from this single agency" (Encandela et al., 2005, p.421). In this way the researchers were able to identify a number of barriers and facilitators to HIV-prevention services based on these diverse case managers' experiences and perspectives.

On the other hand, there may be research topics that are more

amenable to be explored within a homogeneous rather than diverse group, especially if there may be keenly-felt status differences amongst participants such that a heterogeneous focus group may generate little useful data than merely 'official speak', as individuals aligned with the status quo may have a disproportionate influence on the direction of the group discussion despite the best efforts of the facilitator. In such instances, it may be more appropriate to employ homogeneous focus groups, whereby participants with similar backgrounds and/or statuses are brought together to share their views and experience, with each individual feeling safe to contribute in the knowledge that the other participants are in similar circumstances as himself or herself. Sharing one's perspectives and experiences in the company of others in similar positions and/or who had gone through similar experiences, helps to create an atmosphere of psychological safety not readily available in other research contexts.

One example is a study which employed ten homogeneous focus groups, five of which are composed of older people and the other five composed of health professionals, conducted by Giummarra and her colleagues (2007) when investigating the concept of health in older age. The researchers recognised the need to listen to older people's views and experiences separate from those of health professionals, because of the way health in older people has been historically "conceptualised from a medical perspective", and the impetus for the research was precisely to move beyond the medical perspective towards exploring health as "a positive concept that emphasises social and

personal resources” in addition to physical and mental capacities (Giummarra et al., 2007, p.642). The research team therefore developed separate, but complementary, focus group questions for service users and service providers, for use in separate focus group discussion sessions, concentrating on the participants’ meanings and beliefs regarding concepts of health and well-being, as well as their beliefs on factors that influence older persons in looking after their health (Giummarra et al., 2007, p.643).

The researchers also took care to recruit older people with a range of health profiles. Recognising that “focus groups are more likely to be attended by healthy older people”, the research team therefore recruited participants from two falls clinics in the targeted geographic regions “in an aim to recruit participants with more complex health concerns” (Giummarra et al., 2007, p.644). The sessions were held at a venue of convenience to the participants as far as possible, such as within a community or health setting where the services were located, from which the health professional participants were drawn; or at a centre where an existing support group usually met, from which older person participants were drawn. Using such clearly-defined focus groups with complementary discussion guides, the researchers were able to distil concepts of health that are shared across older people and health professionals on a number of dimensions important to successful ageing from participants’ perspectives.

There are also studies that employed a mixture of homogeneous and heterogeneous sampling of focus

groups in the context of health services research. For example, Sofaer and her colleagues (2005) conducted a total of 16 focus groups with a sample of healthcare consumers in four US cities, with the aim of using the data generated from these discussions on domains of hospital quality to guide the further development of the Consumer Assessments of Healthcare Providers and Systems (CAHPS) Hospital Survey. The focus groups as a whole “were structured to be homogeneous with respect to type of healthcare coverage (Medicare, non-Medicare), and type of hospital experience (urgent admission, elective admission, maternity admission, no admission)” (Sofaer et al., 2005, p.2018). Within each focus group, there is a heterogeneous mixture of participants in terms of their demographic profile. Using open-ended questions about items that are considered important to participants regarding hospital quality but without providing any suggestions or examples, the research team was able to identify domains of hospital quality that were hitherto not included in the standard CAHPS Hospital Survey, such as communication with “all hospital staff”, which is the most mentioned domain of hospital quality by 15 out of 16 focus groups (Sofaer et al., 2005, p.2024).

Conclusion

As can be seen from the foregoing discussions, in general, there are theoretical, ethical and practical considerations that need to be taken into account when choosing between particular research methods to fulfil the goals of an investigation. Box 3 below provides a brief summary of these considerations when choosing between interviews and focus groups

as a data collection method when conducting qualitative research.

There is no dogmatic rule for the superiority of one qualitative method over another that is universally acceptable; rather, as health and social care professionals we need to remain sensitive to the needs and circumstances of our target participants, and be open and remain committed first and foremost to the possibilities of genuine engagement in our research investigations. Whichever qualitative method one employs in a study, the ability to listen attentively and empathetically would, and should, trump all other research skills if we are to be serious about pursuing the ideals of qualitative research.

Box 3. Interviews vs. Focus Groups**Question:**

When should I use interviews or focus groups when doing qualitative research?

Answer:

The answer to the above question can be considered from three perspectives: theoretical, ethical, and practical. Theoretical considerations are mainly to do with your research topic and research objective(s). A research topic may lend itself more readily for discussion in private or in a group situation, depending on the participants in question and your relationship with them. For instance, a sensitive topic may be more readily shared on a private, one-to-one basis, whereas a topic that requires multidisciplinary input may be facilitated in the context of a heterogeneous focus group. The decision is also dependent on your relationship with the target participants. If you have a different background from the research participant, you may get better information from running a homogeneous focus group, bringing together participants with a similar background and allowing them to spark off each other's storytelling and experience-sharing in a supportive group context, than by you conducting interviews with them on an individual basis. On the other hand, your research objective may call for comparison of perspectives from all stakeholders, and you may find individual stakeholders more forthcoming with information if you interview them on a one-to-one basis.

Ethical considerations are mainly to do with your non-research relationship(s) with the target participants, and whether it may be considered appropriate for you to collect data from interviewing them one-to-one. If you are a manager of a service, it is often considered inappropriate for you to interview staff and clients even if your target participants are those with whom you do not have a direct working or serving relationship. In such instances, it may be more acceptable to research ethics committees if you propose a focus group discussion where your research role is merely to facilitate discussions; or for you to serve only as a note-taker in a focus group discussion and have a neutral third party to conduct the focus group discussion itself.

Practical considerations are mainly to do with the feasibility of carrying out the research given the resources available to you and the availability and preferences of the participants themselves. Are your intended focus group participants actually available on the same date at the same time? If not, you may have to resort to conducting individual interviews even if you feel that ideally you would like the participants to share their viewpoints and experiences amongst themselves in real time. Similarly, you may not be able to secure a neutral venue accessible to all, in which case you may still have to use interviews at least as a supplementary data collection method to cater to those who could not attend the session. On the other hand, you may simply not have the time and resources to conduct and analyse individual interviews by yourself, and a focus group discussion is often used as a more expedient way of collecting qualitative data from a number of participants at the same time, provided there are no major theoretical or ethical considerations that would require individual interviews to be undertaken.

In summary, there is no one-size-fits-all answer to the above question, but the researcher needs to tailor the method to suit the particularities of his/her research project and participants.

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HOW TO CONDUCT MIXED METHODS RESEARCH

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Mixed methods research (MMR) refers to the integration of quantitative and qualitative approaches across all stages of the research study.

Quantitative Research

Quantitative approaches are used to gain an objective view of the research topic. Quantitative research in health sciences may refer to methodologies such as descriptive surveys, case-control studies, randomized controlled trials and time-series designs. Quantitative research, as a mode of inquiry is often used for deductive research, where the aim is to examine specific theories or hypotheses; gather descriptive information; and/or investigate relationships among variables. These variables are measured and yield numeric data, which is then statistically analysed. The primary focuses of quantitative methodologies are to provide measurable evidence; to help establish (probable) cause and effect; efficient data collection procedures; possibility of replication; generalization to a population; and comparison of groups.

Qualitative Research

Qualitative approaches are used in order to gain a subjective view of the research topic. Qualitative research in health sciences can use methodologies such as in-depth interviews, case studies or focus groups. Qualitative methods facilitate the collection of data when quantitative measures do not exist and help provide a rich, experience-based understanding of concepts, especially those which emerge over time. Typical philosophical approaches to qualitative research in health settings are grounded theory, ethnography and phenomenology. The primary focuses of qualitative methodologies are to provide detailed accounts of specific contexts or settings; and give those who know most about the area, i.e. the people who are experiencing the condition or intervention, an opportunity to explain their experiences and the meaning they attribute to these experiences.

Both approaches have their limitations. For example, quantitative research data may be difficult to fully interpret, especially when they are contrary to the research hypotheses or fail to identify certain factors and so lack validity. On the other hand, qualitative methods tend not to work with large sample sizes that are required to generalise the findings to larger populations. Also, one popular qualitative method, the focus group, can be sensitive to group domination by a small number of participants. Abusabha and Woelfel (2003) suggest that studies that encompass both objectivity and subjectivity are more inclusive. They also argue for the power of cross-validation, where data from each method can be compared, and the possibility that mixing two

types of data effectively cancels out corresponding weaknesses.

Mixed Methods Research

Morse and Niehaus (2009) define MMR as 'the incorporation of one or more methodological strategies or techniques drawn from a second method, into a single research study, in order to access some part of the phenomena of interest that cannot be accessed by the use of the first method alone' (p.9). MMR involves using research approaches such as in-depth interviews, field observations and data from patient records alongside quantitative methods typically used in clinical trials, such as surveys of attitudes and beliefs, and epidemiological measures to develop a better understanding of health problems (Plano Clark, 2010). MMR is more than just conducting qualitative and quantitative work in isolation – the two sets of findings must be integrated. The interest in MMR has grown over the years as questions related to health and healthcare become more complex.

Cresswell et al. (2011) noted that MMR has been used in a broad range of health specialities such as cardiology, pharmacy, family medicine, paediatric oncology nursing, mental health services, disabilities and public health nutrition. The settings also vary from the clinic to the social context of daily activities and relationships, reflecting how the complexities of healthcare systems require multi-perspective research to make sense of current issues (Creswell et al., 2011; Sale et al., 2002).

In a MMR study, there needs to be a clear and complete description of how the integration was completed, so that

the interpretations and knowledge claims can be evaluated. MMR is characterised as a research approach or applied methodology that:

- focuses on research questions that require real-life contextual understanding, multi-level perspectives and awareness of cultural influences;
- analyses both quantitative and qualitative data to address a research question;
- can use multiple methodologies;
- intentionally integrates or combines these methods to draw on their strengths.

MMR represents a useful alternative to the traditional single-method research and produces richer data than objective or subjective methods do in isolation. This is because MMR allows for:

- Triangulation – described as the interplay between 'convergence, inconsistency and contradiction' (Burke-Johnson et al., 2007, p.115). By using both quantitative and qualitative research methods, the degree to which findings are mutually reinforcing or irreconcilable can be determined (Bryman, 2007; Creswell et al., 2004). This means that the research study can expand and may encourage new ways to address the research question. MMR can lead to valuable insights, with the possibility of better understanding complex issues (Teddlie & Tashakkori, 2009), particularly when data generated does not support each other; differences and incongruence can appear and subsequently allow for the development of alternative theoretical

explanations to account for the discrepancies.

- Confirmation or corroboration – to compare data gathered from multiple sources and explore the extent to which findings converge or are confirmed.
- Completeness – with multiple perspectives from a variety of sources it is possible to elaborate on observed phenomena; that is, combining quantitative and qualitative methods generates richer data (Rossman & Wilson, 1985).

Using qualitative and quantitative research methods together may be difficult due to inherent differences in the paradigms or ideas underlying each method. However, MMR does not actually 'mix up' the two methodologies. MMR involves the different data collection methods being combined and importance being given to each approach. Quantitative researchers rely on the power of numbers and objectivity of data collection tools to enhance the validity and reliability of the data. Qualitative methods are critiqued for their subjectivity, and seen as more prone to researcher bias. In order to ensure a minimum of researcher bias, researchers must be aware of and apply, the necessary criteria used to their qualitative and quantitative data (Creswell, Klassen, Plano-Clark & Smith, 2011). Abusabha and Woelfel (2003) see the merging of quantitative and qualitative methods as 'a perfect match' and argue that integration of both methodologies reduces this risk.

Conducting MMR

Though there are no rigid rules when designing a MMR study, similar to any type of research, you need to 'know

what you are doing' and follow appropriate guidelines. Creswell et al. (2011) have developed 'Guidelines on Best Practice' in order to conduct MMR appropriately, these are summarised in Table 1.

Table 1. Guidelines to conduct Mixed Methods Research.

1. Initially ensure there are sufficient resources (e.g., time, financial resources, and skills) to conduct MMR.
2. Clearly state study aims and research questions – include reasons for conducting MMR (i.e. why qualitative, quantitative and mixed methods are necessary)
3. Work out the details of which quantitative and qualitative methods you are going to use for data collection and analysis. For example, when will data be collected, what emphasis will be given to each method and how they will be integrated?
4. Work out the sequence in which the different methods will be used, taking account of how data from each method will inform subsequent parts of the study.
5. Choose a MMR design that can address not only the research questions but also data collection, analysis, and integration procedures.
6. Then go out, collect data, and analyse the data.
7. Work out how the combined quantitative and qualitative approaches have addressed the research problem and questions.
8. And in the final report make it clear how the MMR approach contributed to the findings.

Conducting MMR requires a rationale for each of the above steps in the process. For example, your decision to collect qualitative data before quantitative research (or vice versa); or conduct two quantitative (or qualitative) data collections to inform one data collection session of the other method needs to be justified. To help explain this point, four types of methodologies that have been used in health science research are outlined below. These design possibilities (a) convergent, (b) sequential, (c) embedded and (d) multiphase design are not meant to be exhaustive, rather

to illustrate several possible approaches that can be used (Creswell et al., 2011). In the real world, MMR can be either fixed i.e. where the use of quantitative and qualitative methods is predetermined and planned at the start of the research process; or emergent where methods become mixed due to issues that develop during the research. Emergent mixed methods designs generally happen when a second approach (quantitative or qualitative) is added after the study is underway because one method is found to be inadequate (Morse & Niehaus, 2009). Many mixed methods designs actually fall somewhere in the middle, with both fixed and emergent aspects.

(a) Convergent Designs

When the intent is to merge concurrent quantitative and qualitative data to meet study aims, the researcher combines both quantitative and qualitative research; this is known as a convergent design, sometimes called parallel or concurrent design. For example, a researcher collects quantitative correlational data as well as qualitative individual or group interview data and combines these to best understand participants' experiences of a health promotion plan. The data analysis consists of merging data and comparing the two sets of data and results.

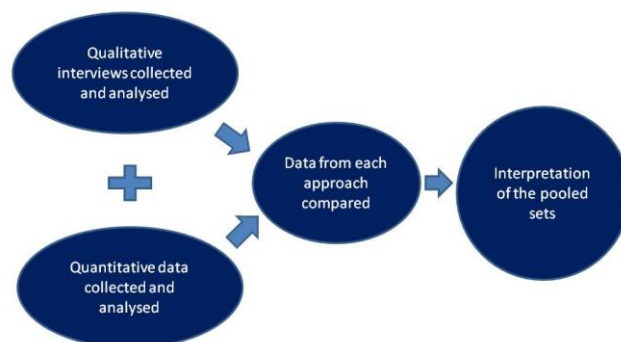


Figure 1. Convergent design.

Case study example of Convergent Design

Casey et al. (2014) evaluated The Dose Adjustment For Normal Eating (DAFNE) study. DAFNE is a structured education programme for managing Type 1 diabetes and provides the skills necessary to estimate the carbohydrate in each meal and to inject the right dose of insulin to help achieve optimal glycemic control. Using MMR they were able to explore why some participants did not attain this goal. Quantitative data generated by the Hospital Anxiety and Depression Scale (HADS), Diabetes-Specific Quality of Life Scale (DSQOLS); Problem Areas in Diabetes (PAID); HbA1c (aggregate blood sugar level over a 3-month period) and qualitative data from 120 interviews were initially analysed separately and then merged and integrated by importing all data sets into NVivo. NVivo is a qualitative software indexing package used to support analysis in terms of managing and organizing the data, managing ideas, querying data, graphically modelling ideas and concepts, and reporting the data. Using NVivo to link quantitative and qualitative data for each participant, researchers were better able to explain and support the

numeric quantitative data with the expressed attitudes, beliefs and behaviours of participants in their qualitative comments. The merging of quantitative and qualitative aspects gave a more comprehensive understanding of the reasons that some participants were able to attain control while others were not. Casey and colleagues (2014) found that motivation and support were factors that differed between those who were 'out of control' and those 'in control'.

(b) Sequential (Explanatory or Exploratory) Designs

The second design possibility is to have one dataset build on the results of the other. These are known as sequential designs and they may begin by a qualitative exploration followed by a quantitative follow up or by a quantitative analysis explained through a qualitative follow-up. The latter is a popular approach in health sciences, where qualitative data help to explain and interpret the mechanisms underlying the quantitative results. For example, the explanation of quantitative results from an anxiety scale may be facilitated and subsequently elaborated by collecting qualitative follow-up data to better understand the responses on the scale. Another approach is to first gather qualitative data to *explore* a particular phenomenon, followed by the potential development and delivery of a quantitative instrument based on findings from the initial qualitative research. For example, the use of interview themes to design a questionnaire about the risks involved in a treatment for diabetes might be followed by an administration of the instrument to a large sample to determine whether the scales (i.e. themes) can be generalised.



Figure 2. Sequential design.

Case study example of Sequential Design

Holden et al. (2015) examined exercise and physical activity in older adults experiencing knee pain by utilising a combination of postal surveys and semi-structured interviews to gather information about older adults' levels of physical activity. This allowed for comparisons between those with and without pain and to gain insights into participants' experience of physical activity. The results from the postal questionnaire were used to guide and structure semi-structured interviews. The quantitative data was elaborated by the inclusion of participants' qualitative experience of knee pain, which was fully described by actually talking to those who had experienced it. Holden and colleagues concluded that the insights provided by the older adults ensured a local knee strengthening programme included specific needs and so sustained participation became more likely. The conclusions reflect how the MMR approach highlighted that: (1) participants were doing very little exercise; (2) they preferred moderate-intensity exercise; and (3) their ideas on the best type and place

for the programme to be delivered. This study reinforces how useful a MMR approach can be when developing psychological, pharmacological, medicinal or physical interventions.

(c) Embedded (or Nested) Designs

This mixed design approach is also commonly used in health science research to create new insights or more refined thinking, which can be conceptualised as a variation of convergent or sequential designs. For example, an intervention study could be conducted in which qualitative data is embedded within the intervention procedure to gain a deeper understanding of participants' experiences. Qualitative data may be collected alongside quantitative data, before the intervention (i.e. to inform how best to recruit participants or to develop the intervention); during the intervention (i.e. to investigate how participants experience the intervention process); or after the intervention, as a follow-up (i.e. to better understand the quantitative outcomes). This differs from convergent design in that the qualitative aspects are included in the quantitative measures, so collected at the same time with the same participants.

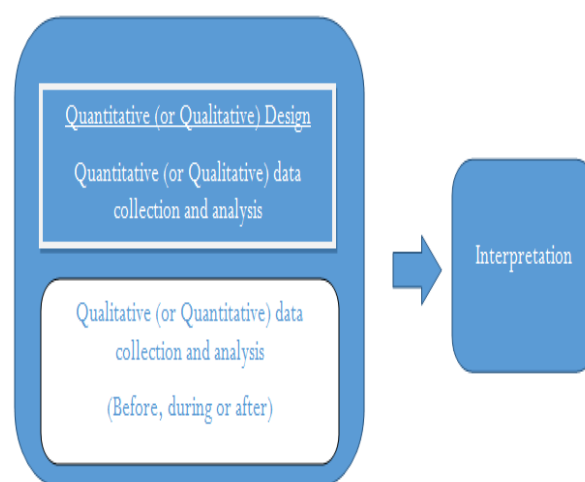


Figure 3. Embedded (or nested) design.

Case study example of Embedded Design

Cheshire et al. (2013) examined patients' perspectives and experiences of healthcare services provided by the UK's National Health Service (NHS), rather than focusing solely on outcomes. They emphasised the need to deliver services which are both clinically effective and acceptable to patients. Participants, suffering from lower back pain for longer than six weeks, evaluated their experiences of an acupuncture and self-care services. Quantitative data were collected using questionnaires which measured level of pain, interference with everyday life, coping ability, anxiety and depression, quality of life and self-efficacy for managing pain. The questionnaires also included open-ended questions, to gather more qualitative data. Participants provided details regarding their general health, what they had learned from the pre-treatment information session, what benefits they had experienced following treatment and their ideas on improvements which could be made to the services. The quality of the findings benefited from the mix of methods in that quantitative data

alone would have been too structured to capture patient experiences and perspectives fully, and qualitative data alone would have lacked the strength in numbers to be seen as generalisable to the wider population. Open-ended questions allowed for greater expression of opinions - an important aspect in this study. As well as the richness of the data, participants indicated that they appreciated having been asked for their opinions in a relatively unstructured way rather than just filling in a questionnaire. Participants, in any study, can easily feel side-lined by the rigidity of 'ticking boxes and meeting numeric targets' (Cheshire et al., 2013). The NHS's new patient-centred policy was clearly reflected in the study, and patients responded well to the 'humanistic qualities' with which they associated, such as empathy. This data, when analysed alongside all the quantitative information, allowed for far greater insight into nuances within the quantitative data.

(d) *Multiphase Designs*

A multiphase project design arises from multiple projects conducted over time, linked together by a common purpose, involving convergent and sequential elements. For example, the overall purpose might be to develop, test, implement and evaluate a health prevention programme. This type of design needs multiple projects (e.g., one quantitative, one qualitative and one mixed), conducted over time, with links in place so that one phase builds on another, with the common overall objective of designing and testing a health prevention programme. So for example, the CHARMS study (Byrne et al., 2013a&b) where a quantitative survey of GPs, cardiac rehabilitators and patients informed qualitative

interviews with GPs and focus groups with the other two key stakeholder groups prior to piloting an intervention. This intervention will then be evaluated using qualitative and quantitative methods. These data will inform a Randomised Control Trial of an intervention with the cardiac rehabilitators and evaluated again both on the processes and outcomes; data from the second quantitative and qualitative studies converging. In short an initial sequential mixed methods design informed the development of an intervention then evaluated using an embedded design, to inform the delivery of an RCT of that intervention in order to enhance outcomes for patients following a stroke.

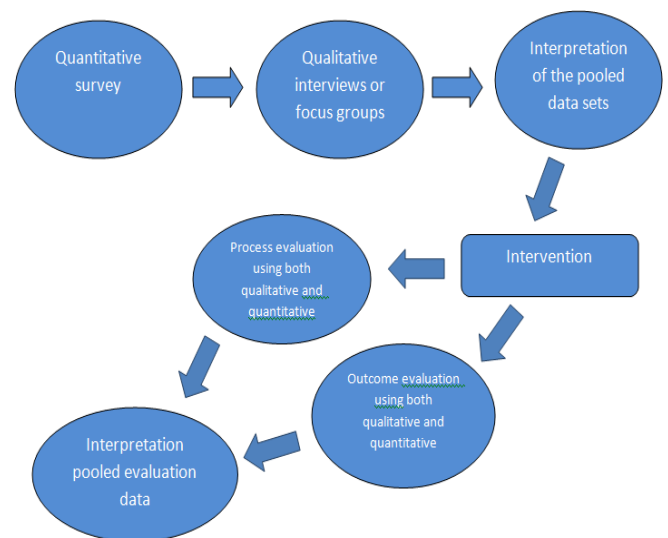


Figure 4. Multiphase design.

Case study example of Multiphase Designs

Fetters et al (2007) developed advance consent in Japan for epidural anaesthesia for pregnant Japanese-speaking women. Their explanatory, sequential mixed methods design initially involved surveys and then telephone interviews with Japanese women. An e-mail survey of health

professionals (both qualitative and quantitative) was conducted concurrently to the telephone interviews. Japanese women and health professionals were both able to express their ideas on how helpful advance consent was for them, and minor problems were also identified. Advanced consent helped lower communication barriers, and highlighted that women wanted more information about pain control. This mixed methods study of Japanese women suggested that bilingual advance consent is an innovative tool to help overcome the language barrier for non-English-proficient women who predictably needed interventions (e.g., epidurals) under unpredictable circumstances.

In the field of applied health, it is important to relate research designs not only to the generation of knowledge per se, but also to its clinical application. As a Health and Social Care Professional (HSCP), if your clinical practice does not involve formal research methods, it is still feasible to introduce MMR into service-based data collection. For example, if running an intervention programme such as an exercise class, data could be collected using either quantitative or qualitative measures, or through a MMR approach. As well as collecting quantitative data on changes in exercise adherence, changes in fitness or mobility, a qualitative component (such as an interview) could be used not only to more closely hear the subjective voice of participants but also to explore other benefits that the researcher might not have anticipated (such as increased social support) and which would therefore have been missed by the quantitative analysis. This helps to improve understanding of

the nuances of subjective experience that can be missed through purely numerical data, as patients have the opportunity to share their subjective perspective. Qualitative approaches also allow for follow-up questions to aid clarification and the opportunity to link themes from one response to another.

Clinicians could consider incorporating MMR approaches into routine clinical practice, for example by adding simple pre- and post-treatment measures supplemented by periodic focus groups with service users to hear their impressions of a treatment programme. Such data can be helpful for service improvement, resource allocation and service planning.

Summary

The process of acquiring knowledge, theorising about complexities, and understanding the impact of complex interventions simply requires a variety of methods be used (Joakim, 2010). Although the 'underpinning philosophies' (Abusabha & Woelfel, 2003) of quantitative and qualitative research methodologies are distinct, they can complement one another when they are combined and used in MMR. The success of past research using MMR in the healthcare arena, in particular, is testament to this. MMR methods offer an opportunity to produce rich sources of data not ordinarily achievable through either quantitative or qualitative methods alone.

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HOW TO CONDUCT ACTION RESEARCH IN HEALTHCARE SETTINGS

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DAVID COGLAN

Introduction

Think about a real or 'live' problem or improvement challenge in your service such as the challenge of how best to implement a policy on quality of service or simply wanting to develop and improve practice. Consider,

1. What the problem/issue is;
2. What you would like to do about it;
3. With whom you would need to work to solve it;
4. How you would try to understand what is going on;
5. If you were invited to give a talk to interested others outside of the project what would you say?

These five questions capture the core of action research: an issue to be addressed, an engagement to address it in collaboration with others and an understanding from the particulars to offer to other like projects. This chapter expands on this simple overview and introduces the theory and practice of action research. Action research has a strong tradition in healthcare and this chapter illustrates this through references to projects led by different disciplines.

As the name suggests, action research is an approach to research, which aims at both taking action and creating

knowledge or theory about that action as the action unfolds. The research outcomes are both an action and new knowledge. In this manner it differs radically from other research approaches which aim to contribute to knowledge only. Consequently it is a powerful approach to service improvement as it is concerned with both the practical improvement itself and the generation of knowledge from reflection on the experience. Action research works through a cyclical process of consciously and deliberately, a) assessing a situation which is calling for change, b) planning to take action, c) taking action and d) evaluating the action, leading to further cycles of planning and so on (Figure 1).

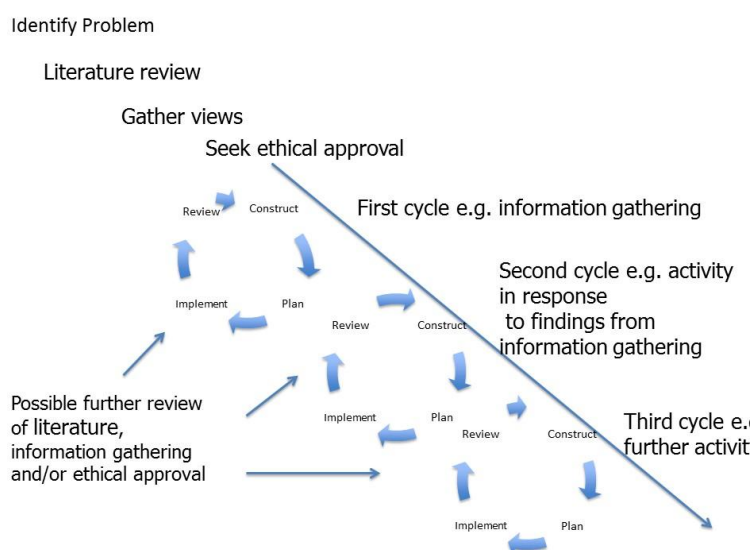


Figure 1: An example of an action research cycle

The second dimension of action research is that it is collaborative, in that the members of the system, which is being studied, participate actively in the cyclical process. This contrasts with traditional research where members are objects of the study.

Some key features of action research

- It is an *emergent inquiry process* as it engages in an unfolding story, the situation changes as a consequence of actions and where it is not possible to predict or to control what takes place. Paying attention to what goes on in the present tense as the project unfolds is central to action research.
- It focuses on *real organizational issues or problems*. The kinds of problems commonly associated with action research in healthcare include service development, addressing multiple/competing views on developing practice, and how best to establish policy implementation and quality improvement.
- It is undertaken in a spirit of *collaboration and co-inquiry*, whereby research is constructed *with* people, rather than *on* or *for* them. This can mean giving a voice to those affected by the change and actively engaging with different and perhaps, conflicting perspectives. Underpinning it is a desire to promote human, economic, and ecological values through action, collaboration and, inquiry.
- It is embedded in *action* and *collaboration*, and addresses the quality of the inquiry outcome(s). There is a clear focus on attending to the process in addition to the project outcomes. Knowledge generation can stem from process and/or outcome
- It seeks to contribute to the realm of *practical knowing* including decisions and actions by

practitioners in order to improve situations and services.

The Action Research Process

Cyclical-sequential phases may be identified that capture the movements of collaboration from planning and action to evaluation and to theory generation (Figure 1). Consider the challenge of how best to implement a policy on quality of service or simply wanting to develop and improve practice. You would identify what precisely the practice is that would address the quality issue. You would solicit other's views from their experience. You would review some relevant literature and have a sense of what research has been done previously and of the state of thinking on the topic. Having identified the issue and rationale for the action research, you would bring your idea to those whose permission is needed to undertake the project and to those who'll work on it with you and who will form an action research group. You would need to get ethical approval from the organization's ethics committee. Your action research group and you then formulate a desired outcome and a general timeline.

The group develops action plans to address the issues and begins to implement them. Action plans may range from designing surveys and holding interviews for gathering information across stakeholder groups as a complement to implementing the plan of action. Together the group evaluates the outcomes of the actions, both intended and unintended. This evaluation may then lead to further cycles of examining issues, planning action, taking action and evaluation. As the process unfolds, a whole host

of concerns may quickly surface. These may include organisational issues, local contextual drivers and challenges, negotiating various vested interests and differing perspectives, and uncertainty as to how the initiative will continue to unfold. Many action research projects involve a range of information gathering methods such as surveys and interviews to inform further actions. In these instances, the action research group needs to understand and use appropriate frameworks for viewing and interpreting the data.

As you and your group progress through the cycles (Figure 1), differences between a change management and an action research project need to be kept in mind. Action research requires a focus on knowledge generation in addition to change. Knowledge may come from attending to learning from the process and/or learning about the issue/problem being addressed. For example, in an action research project that sought to implement basic level palliative care in respiratory nursing practice (change management), Hynes et al (2014) reported that the narratives of acute care with all their attendant values, dominated those of palliative care in everyday practice. This resulted in a struggle to apply the principles of palliative care despite nurses having a strong desire to do so and illustrated some of the complexities surrounding current palliative care policy at national level (knowledge generation).

Three Types of Engagement

Coghlan and Brannick (2014) describe three types of engagement in action research each of which requires a range of skills (Table 1). The primary

engagement is with others through the action research process. We call this second person inquiry and it is illustrated in the project described by Meehan and Coghlan (2004) in which Meehan engaged with staff to evaluate an addiction counselling service (Box 1). This is about face-to-face engagement with relevant others on the project. It involves building and maintaining collaborative relationships, communicating and listening, leading the project, running effective meetings, building consensus and dealing with disagreements and conflicts and so on (Table 1).

Kane (2014) highlights the inherent philosophical differences underpinning assumptions, traditions and practices among different disciplines in healthcare. A health economist, doctor, nurse, physiotherapist, social worker, occupational therapist and administrator may all believe in but still understand and therefore, measure a patient centred approach to care differently. Yet, recognising and engaging with these differences is fundamental to a second person a multi-disciplinary enquiry. Learning to integrate different methods of inquiring and perspectives in judging the quality of evidence that both informs and emerges from the project is an important skill to develop in second person inquiry.

Table 1: Skills needed for each type of engagement

Types of Engagement	Skills
1 st person	Learning-in-action Mindfulness Self-inquiry Reflective practice
2 nd person	Interpersonal (communication, active listening, collaborating, disagreement management) Teamwork Project management Running meetings Facilitation
3 rd person	Conceptualising learning beyond the immediacy of the project

As you engage in cycles of action and reflection with the action research group and with others you are likely to find yourself learning about yourself, especially your skills and attitudes. Through attending to your own self-learning you become aware of broadening the role-based or disciplinary lens and personal experiences from which you make sense of issues as they emerge in the inquiry process. This attention to self-learning we call first person inquiry.

As an action researcher you have to deal with emergent processes, not as distractions but as central to the research process. The desire to be involved in or to lead radical change involves high hassle and high vulnerability, which requires a combination of self-reflection with vulnerability, realistic expectations,

tolerance, humility, self-giving, self containment and an ability to learn. In Box 1, first person inquiry is illustrated by Meehan's insights into his managerial role and behaviour.

Third person inquiry looks to extend outwards from single case/project inquiries towards creating greater impact. At its simplest, third person inquiry is about dissemination: action researchers bringing their projects to a wider audience or writing about action research as we are doing here. However, third person inquiry is also about enabling wider conversations and networks of inquiry to develop so that the project findings can become a part of a wider inquiry. In Box 1 Meehan disseminated his learning at his professional association's annual conference and in the article referenced above.

Diversity within Action Research

What is noticeable in contemporary action research is that there is a wide diversity, not only in practice, but in the forms that action research takes. Action research has become to be understood as 'a family of practices of living inquiry... it is not so much a methodology as an orientation to inquiry' (Reason and Bradbury, 2008: 1). See Table 2 for examples of some of these different forms. Each of these forms has its own emphasis and theoretical underpinnings. The *SAGE Encyclopedia of Action Research* (2014) presents descriptions different action research modalities of action research.

Table 2: Forms of Inquiry Associated with Action Research

Form	Emphasis	Examples
<i>Action Learning</i>	Focuses on real challenges using the knowledge and skills of a small group of people combined with skilled questioning, to re-interpret old and familiar concepts and produce fresh ideas	Edmonstone (2011)
<i>Appreciative Inquiry</i>	Focuses on envisioning the future in order to foster positive relationships and build on the present potential of a given person, organization or situation	Reed (2007)
<i>Co-operative Inquiry</i>	Focuses on the idea of co-researching with others to enquire into a shared problem. Co-researching places an emphasis on researching <i>with</i> rather than <i>on</i> people	Schneider (2012) Kidd et al. (2015) Meehan & Coghlan (2004)
<i>Photovoice</i>	<i>Combines story telling with</i> photography to work with groups in identifying and representing life and experiences often to work towards social action.	Rigg et al. (2014)

Insider Action Research

In addition to different modalities, an external action researcher might work closely with members of an organisation on a project. In healthcare, it is more common for members of an organisation to initiate and undertake action research such as that reported by Coghlan and Casey (2001) and Meehan and Coghlan (2004). Being an insider presents clear advantages in action research in that you are already familiar with structures and processes within your organisation or service that may have a direct bearing on the action research project. You will have a 'feel' for the degree of support for the project; whom to approach and in what order for support at any point and so on. For example, Meehan and Coghlan (2004) describe a project in which Meehan's insider knowledge was important in recognising and managing internal politics in his project (Box 1). However, there are potential

challenges also not least, how your perspective may be reflected in the dominant knowledge base and culture of the organisation. Even while arguing against the dominant knowledge base of, for example, biomedicine, you will need to critically examine the subtle ways that your insiderness shapes your actions. Moreover, there may be degrees of being an insider/outsider in the process. For example, if you are a physiotherapist you are an insider as a member of a large organisation and the physiotherapy service. However, if you are sitting in a meeting room full of nurses from the same organisation to discuss a change in nursing practice, you may feel yourself to be an outsider even if the change has a direct bearing on physiotherapy. Examination of your insiderness through first person inquiry such as that reported by Kidd et al (2014) is therefore important.

Box 1: Developing Managers as Healing Agents in Organizations: A Co-Operative Inquiry Approach

Meehan and Coghlan (2004) describe an action research project in which Meehan sought to evaluate an addiction counselling service. Previously, a psychiatric nurse, Meehan had a manager role in this service. While the request for an evaluation came from his superior, Meehan discovered that the counsellors felt the evaluation was futile since the organization would not accept the findings.

As the counsellors expressed their sense of alienation from the organization, Meehan speculated that if an effective evaluation was to take place the feelings of the participants needed to be heard and dealt with in some way. He was becoming aware that he was utilising his clinically honed listening and counselling skills in the process enabling the group to explore feelings they had about these issues. As time went on he became more convinced that he was working on a project that would really benefit from an action research approach and he entered into discussions with the group on the issue. His thinking in this regard was that the action research approach would both enable an effective evaluation which would be accepted and would likely to produce insights that could not be gleaned in other ways. He hoped that the process would enable the group to get new and innovative insights into the service and to take action based on them.

Following his invitation the group agreed to engage in a co-operative inquiry into issues pertaining to themselves and the service. Over a six-month period the group met eleven times and explored three themes: feelings of alienation and powerlessness, the lack of strategic direction in the service and professional identity and autonomy. They carried out a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of the service and identified areas for change, both within themselves and in the management of the service.

As he led the group through the formulation of an action plan to initiate a service evaluation, Meehan found himself confronted by a feeling of futility within the group. On one level he was getting feedback that his intervention was helpful but how it was helpful was not articulated. On another level the group was sceptical about the usefulness of the evaluation. Meehan then began to see his role as a go-between or an arbitrator between the management team and the addiction counsellors and in some way he perceived that if he could get a good evaluation of the process utilising management input, addiction counselling input and from a service users' perspective that would solve the issue. However intuitively he was picking up resistance and vibes saying that this is not going to work.

The group of addiction counsellors worked in the group to reflect on their experience and to develop new and creative ways of looking at things. They also learned how to act to change things they wanted to change and explored how to do things better. Each member acted as a co-subject in the reflection phases and a co-researcher in the action phases. They enacted the action research cycles of reflection and action in a psychologically safe environment, which enabled them to make sense of their experience and take steps to initiate change. Overall the outcomes of the cooperative inquiry process were that there was a reduction in the feelings of alienation and powerlessness in the group and this was evidenced in the enthusiasm with which the group subsequently engaged in the evaluation. There grew a commitment to work in partnership with all stakeholders and service users in evaluation and developing the service. The group was beginning to look at issues from other perspectives and this appeared to reduce hostility and fear. There were also real issues about their power in the organization, at one level they felt as victims in the process, yet it was obvious unless they agreed with changes they were unlikely to get implemented.

Meehan found the whole process difficult yet rewarding. It was an ongoing dynamic and he found he learned a lot in the process. It was the first time he had consciously bridged the gap between his role as a clinician and as a manager. It showed him how to utilise his skills as a clinician in management. He found that the action research cycles to be very useful and it produced insights, which he believed could not be gleaned other ways. The process was also a healing one and he believed it empowered the group to deal with underlying difficulties in the service.

The process enabled Meehan to explore new and interesting ways of viewing his role as a manager; it gave him an insight into potential ways of working with alienation and powerlessness in the workplace. In hindsight he was able to manage many of the political elements because as an insider he understood the process politics of the organization. He found himself as a middle manager who has to understand internal and external pressures on the organization and satisfy the personal or competing interests. The personal and emotional issues remained confidential to the group but the broader learning from the group was discussed. Changes to the management structures, issues regarding supervision, renegotiations regarding time frames were for completion were all dealt well and there was no conflict on these issues.

On doing action research in and on your own organisation, Coghlan and Brannick (2014) highlight the need to balance your organisational roles, in which you intend to continue, with the additional demands of a role of research. You need to learn to be aware of how your roles influence how you view your world as well as how you are perceived by others, and to be able to make choices as to when to step into and out of each of the multiple roles that you hold.

If you are seeking to do research in order to achieve academic certification, additional issues arise in relation to selecting a research question and area for study and how to write up such a research project, to give feedback to your superiors and peers and to disseminate the research to the wider community. Issues of ownership might arise wherein others within the research action research group view the project as yours rather than belonging to the group. This can impact the nature and quality of the participation, and the degree of shared responsibility. Handling interpretations or outcomes which would be perceived negatively by the organisation is a particularly sensitive issue. You are also likely to have access to 'external' academic supervisors who advise and support you throughout your research project.

Ethics and Ethical Approval

In general, the role of ethics committees is to avoid or prevent abusive behaviour and to protect those affected by the research. Thus, the committees act as guardians of ethical practice. By and large, the members of these committees come out of the conventional research tradition and expect that hypotheses, methods and

expected outcomes are well articulated in advance and so review of research proposals is fairly straightforward. When they are confronted with action research proposals they are frequently at a loss as to how to understand this form of research and as to how to evaluate a proposal. Given that action research is an unfolding, emergent process which evolves through cycles of action and reflection, it is not feasible to map out a detailed anticipation of ethical issues in advance which will cover all eventualities (Morton, 1999). Protocols are inadequate and are insufficient to meet the face-to-face, participative close work of action research. At the same time it is possible to articulate some ethical principles to guide your work as an action researcher. Hilsen (2006) argues that ethics in action research may be based on three pivots: human interdependency, cogeneration of knowledge and fairer power relations. Boser (2006) proposes that attention to ethics needs to:

- a. be guided by a set of externally developed guidelines that direct attention to the set of relations among those participating in or affected by the research
- b. be integrated into each stage of the action research cycle to inform decision-making by stakeholders, and
- c. be transparent to the larger community.

Quality Demands

What are the characteristics of good action research? First there must be the intention to change the organization or improve the service. Secondly, the project must have some implications beyond those involved directly in it; otherwise it is simply a project management process. Thirdly, the

project must have an explicit aim to elaborate or develop theory as well as be useful to the organization. Fourthly, theory must inform the design and development of the actions. Fifthly as rigour refers to how data are generated, gathered, explored and evaluated, in action research this means attention to the process. How events are questioned and interpreted through multiple action research cycles (Figure 1), requires a systematic method and orderliness in enacting the action research cycles, especially in reflecting on the outcomes of each cycle and the design of the subsequent cycles. The key characteristics of action research referred to earlier need to be reflected in the research process. As the process unfolds, choices are made and these need to be explicit. For example, how/when to involve others, why/when/how actions are taken. Other data collection methods such as surveys and interviews must be undertaken in keeping with the respective requirements for rigour.

Final Thoughts

Action research has a strong tradition in healthcare (Koch and Kralik, 2006; Koshy, Koshy, and Waterman, 2011; Parkin, 2009; Williamson, and Bellman, 2012). The scale of an action research project may range from a single practitioner inquiring into her practice (Kidd et al, 2014) through to large multi-centred initiatives such as that reported by Blackford and Street (2011) and (Steenbakkers et al. 2012). Multi-centred action research projects provide scope to pilot or test projects aimed at delivering on national/regional level policy changes while engaging with differences across organisational contexts including culture. Action research also provides a framework for practice-based feasibility studies and

process evaluations enabling researchers to allow those directly affected to shape the process and enable contextual and cultural influences to be made explicit and examined.

Conclusion

Action research is well suited to undertaking research for service improvement not least because of the complexity of the healthcare environment and the importance of culture and context in quality improvement and practice-based interventions. Action research aims to both take action and create knowledge or theory about that action as it unfolds through iterative cycles of action and reflection. Three levels of inquiry typically present in action research: first, second and third person inquiry reflecting the importance of situatedness, researching in the present and dialogue. Insider action research is common in healthcare and has clear advantages including insider knowledge. There are also challenges to insider action research and these can be addressed through first and second person inquiry. A number of key characteristics including the emergent nature of the inquiry process, the quality of relationships and process, and the quality of outcomes provide the basis for attending to the rigour of an action research projects.

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RESEARCH ETHICS: GUIDELINES FOR PRACTICE

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Those involved in carrying out research are expected to do so in a way which is ethical and which respects the dignity and welfare of the research participants. Most institutions involved with research, such as health and human care services and educational institutions, require researchers to seek ethical approval before commencing their research. The ethical guidelines and procedures of each institution will vary in their detail and ethics committees also have their own “culture” and norms, as a result of which requirements and practices may vary considerably. This paper aims to provide an overview of common ethical standards to assist the researcher in considering the ethical aspects of their research. In providing this overview, researchers should also be mindful of local guidelines, policies, legal frameworks and discipline-specific ethical guidelines as they apply to the profession of the principal researcher. Research projects carried out in a number of partner institutions are likely to require ethical approval from each of the individual agencies unless there is a formal arrangement for reciprocal approval.

In considering the ethical aspects of research, four key domains warrant attention: (1) the scientific design and methodology of the research; (2) the

manner in which participants will be recruited and assuring their safety (including psychological and emotional wellbeing); (3) informed consent and procedures for explaining the research in a way that will enable potential participants to make a fully informed decision; and (4) protection of research data.

Each of these domains will be considered in greater detail below. Researchers should, for each point, consider the extent to which their research proposal addresses the specific point:

(1) Scientific design and conduct of the research:

- Clear rationale and justification for the research – almost all research places a degree of burden on participants – thus there is an ethical obligation on the researcher to ensure that the burden is justified.
- The research design can realistically address the research question and has an adequate sample size to detect the variables of interest.
- Suitability of the protocol and the data collection forms.
- Justification of predictable risks and inconveniences versus anticipated benefits for participants/volunteers and the general community.
- Criteria for prematurely withdrawing participants/volunteers from the research.
- Criteria for suspending/terminating research.
- Adequacy of provisions for monitoring and auditing the

conduct of the research, including data safety.

- Adequacy of the site including support staff, available facilities and emergency procedures where applicable.
- The manner in which the results will be reported and published.

(2) Recruitment and protection of research participants

- Characteristics of the research population and justification for selection - 'non-competent' or vulnerable participants should be included only when necessary, and their inclusion must be justified. There is a special onus on the researcher to protect vulnerable participants.
- Method by which initial contact and recruitment made and appropriateness of this contact (bearing in mind that access to contact details of potential participants can in itself raise ethical issues).
- Method by which full information will be conveyed to participants and the method through which consent will be obtained.
- Inclusion and exclusion criteria with justification for same.
- The safety of any intervention used.
- Suitability of the investigator (qualifications/experience).
- Queries and complaints procedure.
- If applicable, plans to withdraw standard therapies or treatments as part of the research protocol and justification for this.
- If applicable, adequacy of support during and after the study.
- Procedure for a participant's early withdrawal (as decided by the participant) or termination from the study (as decided by the researcher).
- If appropriate, procedure for informing participant's GP or other health care providers of their involvement in the study and circumstances under which research data may be disclosed to GP or others (for example, if a health problem was detected during the research).
- A description of any financial costs to participant.
- The rewards and compensations (if any) for participants and justification for same. Rewards should not be so strong an inducement that they compromise real choice about whether to participate. [Note: many educational institutions have a 'Course credit' system for students to participate in research – this raises ethical issues in terms of voluntariness – one strategy to deal with this is to provide students with an alternative method of gaining course credit].
- Provisions for compensation/treatment in the case of injury/disability/death.
- Insurance and indemnity arrangements covering liability of investigator.
- Description of payments to researcher to conduct study.
- Who will have access to personal data?
- Measures taken to ensure confidentiality and security of personal data.
- Extent to which the information collected will be anonymised.

- How samples/data will be obtained and the purpose for which they will be used.
- How long will samples/data be kept (standard is 5 years)

(3) Consent

- Full description of consenting process.
- Adequacy, completeness and understandability of written and oral information given.
- Content and wording of Participant Information Sheet – ensure language is clear and minimises use of jargon. Most Ethics Committees have a template available.
- Procedure for informing participants who are not literate.
- Content and wording of Informed Consent Sheet and provisions for those incapable of giving consent personally.
- Justification for including individuals who cannot consent and full account for arrangements in obtaining consent from others where appropriate.
- Assurances that participants/volunteers will receive any new (relevant) information that becomes available during the course of the research.
- Careful and realistic consideration of potential risks, adverse effects, physical or psychological discomfort to participants, likelihood of occurrence, and steps taken to deal with risk.
- Provision of a “Distress Protocol” for responding to participants who may be distressed by the content of the research (bearing

in mind that support may range from direct access to the researcher to provision of contact information for support services and that some research may be done at a considerable geographical distance, for example, online survey respondents may be from other countries).

- Where indicated, there may be a safety protocol for the researcher. This includes items like:
 - The researcher will inform his/her supervisor specifically when and where interviews will be conducted and will report in on return from each interview.
 - The researcher will carry a mobile phone at all times.
 - All interviews will be conducted during daylight hours.
 - Interviews will be conducted in open areas where possible, and near domestic housing and/or populated areas.

A very good recent review paper (Grady, 2015) highlights many of the challenges and some possible solutions associated with informed consent. Although approaching the problem primarily from a clinical practice perspective, similar issues arise when conducting clinical research.

(4) Confidentiality

- Ensuring that information is accessible only to those authorized to have access to it (specified members of the research team).
- Precaution regarding the public use of audio, video, visual materials if confidentiality and anonymity were guaranteed.

- Where the research involves access to medical records – only material relevant to the study must be accessed.
- Where there are research assistants, the main investigator has responsibility to ensure that others observe the limits of confidentiality.
- When disseminating findings, care must be taken not to breach confidentiality or anonymity. This is especially important when using case studies and also when reporting qualitative data, since participant comments within small studies could be readily identifiable.

Research with Children and Vulnerable People.

Generally speaking, the primary ethical challenge regarding risk of participation in research is to ensure the protection of individual children participating in the research while making sure that the research improves the situation of children as a group (Kopelman, 2000). Children may give assent to participate – assent is defined as a child's agreement to participate in research. A child's assent needs to be complemented by a decision of a 'legally recognised surrogate decision-maker' (Baylis, Downey & Kenny 1999). This position is based on an assumption that children or adolescents are not yet fully competent to make such decisions, especially not decisions that might involve some risk of harm. This person is most likely to be a parent or legal guardian. Note that there are sometimes conflicts between the legal definition of adulthood (18 years in Ireland) and the capacity of the person to consent – many 16- and 17-year-olds are intellectually able to give informed consent but parental consent

is still required. This anomaly is very obvious in the case of University students who may be attending college, driving a car, working in a part-time job and living independently but they are still regarded as a "child" for the purpose of giving consent to participate in research activities that may be an integral element of their studies. While seeking parental consent for a 17-year-old university student may seem unnecessarily patronising, generally it is advisable to err on the side of caution and take too many safeguards rather than too few.

When working with young children or people with limited capacity for communication or understanding, the researcher needs to be familiar with the needs and characteristics of that population group (Broome, Kodish, Gellar & Siminoff, 2003; Holaday, Gonzales & Mills, 2007). It can be informative to speak to a content expert or a person representing that group of people in order to make oneself aware of any specific issues. Information and consent forms for children or people with low literacy should be in an "easy-read" format. Use of pictures and short written explanations is generally more appropriate for younger children. It is recommended to involve children themselves in the development of informed consent material (Ford, Sankey & Crisp, 2007) as this will help to ensure that the material is suitable for the intended audience. Further guidance on ethical research with children is available from Felzman, Sixsmith, O'Higgins, Ni Chonnachtaigh & Nic Gabhainn (2010) and National Disability Authority (2002, 2009a, 2009b).

Conducting research online

More and more research is now carried out using the internet, electronic surveys, phone apps and other technologies. Internet based research can be hugely advantageous in terms of reaching a wide audience, it is relatively low cost, it can enable participation at a time convenient to the participant, it can open up the possibility to conduct research on participants who otherwise would have been difficult or impossible to gain access to, and the data is automatically entered once the participant completes the online questionnaire. Similarly, the guidelines from the British Psychological Society highlight that there are many advantages to electronic data storage - it is a more compact, economical and efficient alternative given the amount of space required and cost of maintaining and storing paper records. Furthermore, many individuals may prefer to complete online questionnaires rather than paper questionnaires.

However, these methods of conducting research may raise particular challenges from an ethical point of view, particularly in relation to consent and data security.

Regarding consent, online studies may require people to self-identify as fitting the participation criteria. The researcher may not have control over who receives the invitation to participate, particularly if recruiting through an open access web-page rather than a mailing list. Thus, researchers will need to consider whether any ethical or safety concerns arise from having less control over this part of the study. Many online studies ask participants to tick a "Yes" box and this represents informed consent - a

statement to that effect must be on the Information Sheet and the Consent Form. Some software applications allow for the inclusion of an electronic signature. Local ethics committees may vary in terms of whether a signature is required. The British Psychological Society (2013) has produced a very helpful free guide on conducting internet-mediated research (listed in References below).

Conclusion

The process of conducting ethically sound research is clearly multifaceted and at times challenging, but ethical awareness must be at the centre of any research endeavour. Keeping ethical principles at the centre of research planning will help to ensure that the research activity is carried out in an ethical manner. In addition to the resources cited here, the UK Economic and Social Research Council, which funds a good deal of the social science research in UK, has published a very good free-access Ethics Framework and an accompanying online Research Ethics Guidebook with helpful case studies (see reference list below regarding access information).

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HOW TO ANALYSE QUANTITATIVE DATA

BRENDAN ROONEY
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Introduction

Statistical analysis is often seen to be synonymous with quantitative research; however Langdridge and Hagger-Johnson (2009) note that for many researchers, it is an area where they feel least confident. Developments in quantitative and statistical analysis can mean that the basic courses many professionals take during their training cannot not equip researchers with the full range of techniques used in research. However, the basic understanding of statistical assumptions and common techniques that they provide, represent an important foundation upon which to build a more developed understanding. An important starting point is to recognise that statistical techniques represent a set of tools available to the researcher, and as with all tools, success is a function of picking the right tool for the job at hand. In light of this, the aim of this article is to reflect on the analysis of quantitative data, examine some of the common methods reported in published research, and to examine the process of selecting appropriate method of analysis.

A Note on Invaluable Resources

Unless you are regularly using them, most researchers do not remember all the intricacies of quantitative and statistical analyses. However many researchers will have favourite books, which act as a key resource in the process of research and analysis. In our experience it is not unusual for

researchers to be most comfortable with the statistics textbook that they themselves studied in training. What is essential is that you are comfortable with the style of the textbook and familiar with its content. Having said that, there are some eminently useful texts that the reader might be interested in, the first of which we liberally refer to in this article: Vogt and Burke Johnson's (2011) *Dictionary of Statistics and Methodology*. With the subtitle of *A Nontechnical Guide for the Social Sciences*, this accessible text presents the reader with a literal A to Z of what can be (in articles and indeed other books) impenetrable jargon relating to research and statistics. Andy Field's humorously entitled website www.statisticshell.com/ is a comprehensive online resource which offers guides to statistics at different levels of expertise, lists of further resources and an FAQ section. And finally, various publications and online tutorials based on the work of Professor Geoff Cumming of La Trobe University, Australia, provide useful support in conducting certain types of analysis, termed "new statistics" that is mentioned towards the end of this article (See Cumming, 2014, as a useful open access resource).

General Approaches to Quantitative Data Analysis

To begin it is important to recognise that quantitative analysis is an umbrella term for a wide range of approaches and techniques. Utts (1996) captures this with her definition of statistics as "a collection of procedures and principles for gaining and processing information in order to make decisions when faced with uncertainty" (p. 4). The procedures are varied and include simple techniques for capturing the nature of a data set such as descriptive

and frequency analysis, more advanced inferential statistics, which allow for making inferences about a population based on the data collected from a sample, and meta-analyses that use statistical techniques to review and synthesis the findings from existing research.

The wide range of procedures and techniques available is the main strength of quantitative analysis; however it is also a challenge. For example, researchers may decide to conduct multiple analyses in order to identify the most relevant findings. Conducting multiple analyses like this can be problematic as it might increase the probability that you will find a significant effect in your sample, that is not true for your population. This point is about the likelihood of making Type I and Type II error (which are summarised in Table 1). Trochim (2006) makes the same point and links it with the idea of conclusion validity. Trochim describes conclusion validity as the extent to which conclusions drawn from analysis are valid.

The development of computer-based analysis programmes such as Stata, R, and the widely used SPSS (Statistical Package for the Social Sciences, IBM, 2012) have added to the ease with which researchers can conduct multiple analyses. However in this way their development has also contributed to the problems of multiple analyses. In order to minimise the challenges associated with this issue, it is essential that the analysis of any data set is driven by the research questions or hypotheses posed at the outset of the study. The research questions or hypotheses are an essential guide in the process. For example different techniques will be required depending

on whether the researcher is interested in exploring relationships, group comparisons or more complex effects or trends. Additional choices regarding analysis procedures will be driven by the specific design of the research (and we explore some of these issues below).

Table 1: Definition of Type I and Type II error.

Error	Definition
Type I (Alpha)	"An error made by wrongly rejecting a true null hypothesis. This might involve incorrectly concluding that two variables are related when they are not, or wrongly deciding that a sample statistic exceeds the value that would be expected by chance." (Vogt & Burke Johnson, 2011, p.407- 408)
Type II (Beta)	"An error made by wrongly accepting (or retaining or failing to reject) a false null hypothesis." (Vogt & Burke Johnson, 2011, p.408)

The focus of the rest of this article is on the process of deciding on the appropriate method of quantitative analysis for a study. However before considering this decision making process, researchers should initially consider the nature of their data, particularly in terms of the type of data gathered and whether assumptions can be made about the normality of the distribution.

Identifying the Nature of Quantitative Data

It is important that a researcher reflect on the nature of the data they have collected as this influences the types of

analysis procedures available to them. Table 2 summarises the four scales of measurement that are commonly represented in research data. Nominal data includes categorical measurement such as gender, handedness or political affiliation. Ordinal data is also categorical but with a clear hierarchy and includes data such as first, second and third in a race, or categorising participants as children, adolescents and adults. Interval and ratio data are similar in that they both have fixed intervals between adjacent data points. The difference here is the presence or absence of a true zero point (where zero is the absence of the phenomenon being measured). In quantitative analysis interval and ratio data are treated the same and are sometimes referred to jointly as scale data.

Table 2: Definitions of main types of data (from Vogt & Burke Johnson, 2011)

Error	Definition
Nominal Data	"numbers stand for names but have no order or hierarchy" (p. 252)
Ordinal Data	"ranks subjects (puts them in order) on some variable. The differences between the ranks need not be equal" (p. 271)
Interval Data	"the distance between any two adjacent units of measurement (or 'intervals') is the same, but ... there is no true zero point" (p. 186)
Ratio Data	As with interval data though there is a true zero point

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represented in research data. Nominal data includes categorical measurement such as gender, handedness or political affiliation. Ordinal data is also categorical but with a clear hierarchy and includes data such as first, second and third in a race, or categorising participants as children, adolescents and adults. Interval and ratio data are similar in that they both have fixed intervals between adjacent data points. The difference here is the presence or absence of a true zero point (where zero is the absence of the phenomenon being measured). In quantitative analysis interval and ratio data are treated the same and are sometimes referred to jointly as scale data.

As well as identifying the type of data gathered, the main implication of this process is the impact it has on the choice of data analysis methods (see Figure 1). Generally speaking Nominal and ordinal data are analysed using non-parametric techniques. These are techniques that do not assume a normal distribution. However, it would not be correct to assume that scale data by comparison automatically allow the researcher to use parametric analyses (which draw on the properties of a normal distribution). It is possible that scale data are not normally distributed and it is important that the researcher reflect on the assumption of normality in the population or (where the sample is large enough) test for normality in the sample. This can be done by either examining levels of skewness and kurtosis in the sample or conducting a statistical test such as the one sample Kolmogorov-Smirnov test, which determines whether a given distribution differs significantly from normal (Vogt & Burke Johnson, 2011).

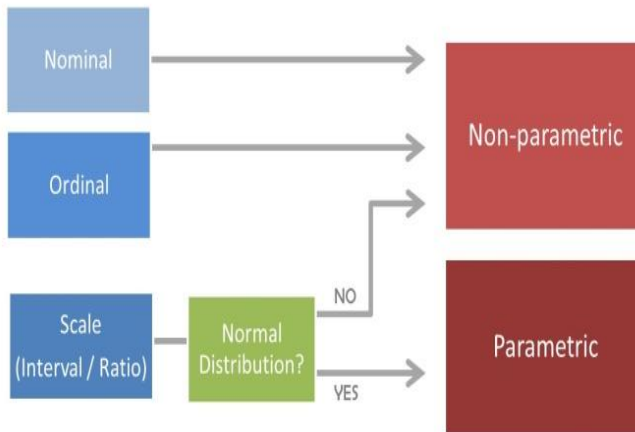


Figure 1: The influence of type of data on selection of analysis techniques.

A Note on Hypothesis Testing

As mentioned above the research questions and hypotheses proposed by the researcher have a key role to play in informing the analysis procedures used. This is particularly true with hypotheses, which can be tested using statistical analysis. Quantitative researchers will be familiar with the concept of the alternative hypothesis, which is used to capture the differences or relationships the researcher expects to find in the data. In comparison the Null hypothesis proposes that there is no difference between the parameters of the groups or no relationship between the target variables. Many statistical analysis procedures (whether parametric or non-parametric) focus on testing the researcher's hypotheses by seeking to reject or failing to reject the Null hypothesis, with Type I and Type II error representing the problematic outcomes that can occur (see Table 1 above). As Vogt and Burke Johnson (2011) summarise, when testing hypotheses the Null hypothesis is rejected if the significance level is lower than the preset alpha level, which is typically set as 0.05 in social science research.

Selecting Statistical Tests

Next, this article examines the decisions involved in selecting tests. We will consider three groupings of tests or analyses; test of relationship, tests of difference and complex analyses.

To begin, test of relationship generally take the form of correlations, and both parametric and non-parametric tests of correlation are available. One of the most widely used tests of correlation is the Pearson Product Moment Coefficient (normally called simply Pearson's correlation). This is a parametric test that examines the direction (positive or negative), magnitude (from 0 to 1, with higher values indicating stronger relationships) and statistical significance of the relationship between two variables (both scale data). The non-parametric correlation is the Spearman's Rho, which also establishes magnitude, direction and significance. However correlations are limited by their bidirectional nature and procedures such as linear and logistic regression, which examine the *predictive* nature of the relationship may be needed to move beyond the relatively simplistic findings of the correlation techniques.

Moving on to tests of difference, Figure 2 and 3 capture the main methods of comparing groups, with Figure 2 detailing the options for parametric analyses and Figure 3 non-parametric analyses.

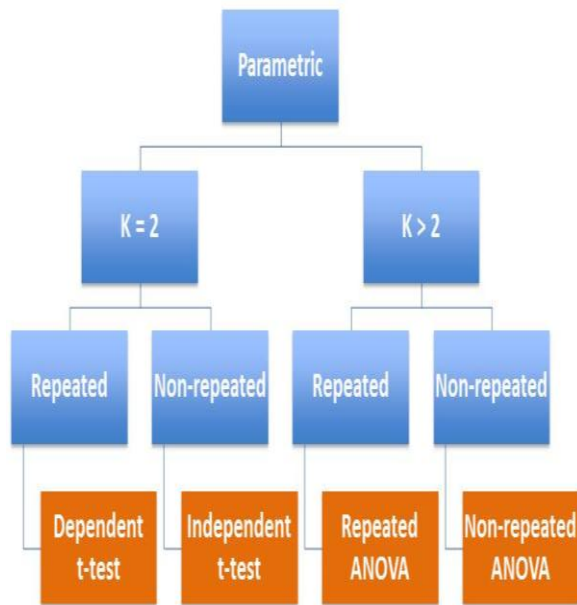


Figure 2: Common methods for parametric analysis of group differences (K = number of groups/conditions).

The key decisions highlighted in these decision trees are the number of levels of the independent variable (group or condition), which are represented by K and whether the independent variable is repeated or non-repeated. For example, a researcher looking at gender differences in IQ would note that IQ is normally distributed, thereby requiring parametric analyses, gender has two levels (male and female) and that these are non-repeated (participants belong to one group or the other). Therefore an independent t-test would be most appropriate in this instance. By comparison a researcher examining change over the course of a treatment or intervention at three time points (pre, post and follow-up) and using a non-standardised outcome rating (e.g., general acceptability of the intervention) may opt to use the non-parametric Friedman’s Analysis of Variance (ANOVA) as the dependent variable (acceptability) cannot be assumed to be normally distributed. It

is important that any researcher identifies these elements of the analysis based on the research questions that drive the research.

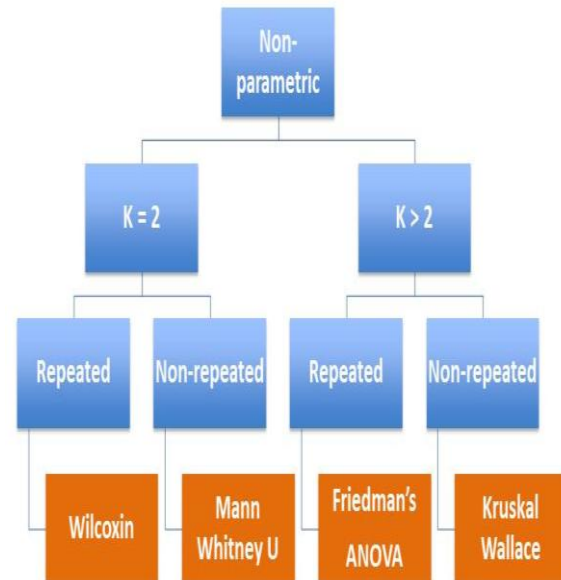


Figure 3: Common methods for non-parametric analysis of group differences.

The final category of analysis considered is the broad area of complex analyses, by which we refer to analysis techniques which move beyond the single independent, single dependent variable methods described above. We have already noted the role of regression methods as a way of building on simple correlations, and there are more complex methods available to further examine group differences. Complex ANOVA methods allow researchers to examine the interaction of multiple independent variables, for example randomised control trials comparing change overtime in a treatment and a control group may use a two-way mixed model ANOVA to look at the interaction of Time (e.g. pre and post treatment) and Group (Treatment vs. Control). Additional complex analyses using ANOVA method include Multiple

Analysis of Variance (MANOVA) which allows the researcher to examine multiple (related) dependent variables and Analysis of Covariance (ANCOVA), which “provides a way of statistically controlling the effects of variables one does not want to examine in a study” (Vogt & Burke Johnson, 2011, p.9). For example, a researcher may decide to use ANCOVA methods to control for the age of participants in an outcome study.

In addition to these methods, recent developments in statistical modelling have introduced a range of additional techniques in health and social science research. Structured equation modelling (SEM) which Vogt and Burke Johnson (2011) define as “a sophisticated statistical method for testing complex causal models in which the dependent and independent variables ... are latent” (p.384), with latent variables defined as variables that cannot be directly observed and have to be inferred from observed variables. For a further consideration of these complex techniques we recommend Tabachnick and Fidell (2007). Finally, some statistical techniques, including meta-analysis, can be used to combine data from multiple studies so as to provide more precise estimates of the size of statistical effects, than individual studies (Glass, 1976). Thus meta-analyses can make important contributions to our understanding of a large body of research, perhaps where conflicting findings have been reported in the past. Indeed these methods of synthesis are seen as being more powerful as they represent a consideration of filtered evidence (evidence that has been assessed in terms of quality) across a body of research rather than an isolated stand

along study. The move towards synthesis of research is part of the “New Statistics” movement mentioned earlier, which also includes a rejection of traditional hypothesis testing and significance values (Cumming, 2014). However the implications of this movement for research in health and social care are still to be identified.

Conclusion

In summary there are some key messages to remember. First, and perhaps most importantly, remember analysis of data needs to be **driven by your research questions or hypotheses** and this helps avoid fishing for findings from multiple analyses. Secondly, it is important that you are clear on the **effect** your question explores; ask yourself are you interested in the presence of a relationship, a group difference, or something more complex? Finally if possible, translate your question into **variables**, and, where possible, for each one identify the answers to the following questions:

- What is the nature of your data; can you identify the data as nominal, ordinal, etc?
- Can you identify elements as independent and/or dependent variables?
- For independent variables, what are the levels (K) and how many levels does it have? Is it a repeated or non-repeated variable?
- For the dependent variable, can you assume it is normally distributed in the population (e.g. what does the literature say?) and/or is the sample large enough to test the distribution for normality

This paper has considered a range of common analysis techniques used with quantitative data. We have noted the risks of multiple analyses, and indeed that the flexibility of computer-based programmes makes multiple analyses easier to conduct. The variety of methods available and the potential for multiple analyses highlights the need for analysis to be driven by the focus of a given study, and in particular by the research questions the study seeks to answer.

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HOW TO ANALYSE QUALITATIVE DATA

SUZANNE GUERIN

Introduction

Analysis of any form of data represents a key component of research, and in some ways data analysis constitutes the meaning making part of the process. For many researchers a key aspect of qualitative research is that the analysis process is guided less by the expectations of the researcher in advance of the analysis and more by their reaction to and engagement with the data during the analysis phase. However the process of analysing data is influenced by a multitude of factors including the methodological framework adopted by the researchers, the research questions that guide the study, the methods of data collection used and the nature of the data collected using these methods. It is also likely that the researchers' own background, training and preferences will be influential in how they approach this key aspect of the research process.

Recognising this, the aim of this article is to reflect on the analysis of qualitative data and to consider the nature of qualitative analysis, examine some of the common methods used in published research, and to examine use of computer programmes in qualitative analysis. The procedures for ensuring the credibility of the analysis will also be considered before the article concludes with some general recommendations.

General Approaches to Qualitative Data Analysis

The aim of qualitative research is "to understand and represent the experiences and actions of people as they engage and live through situations" (Elliot, Fisher, & Rennie, 1999, p. 216) and in adopting this methodological approach researchers use a variety of methods of data collection. The most common form of data collection in qualitative research is the interview; however as Figure 1 presents, there are a range of methods that may be used, each capturing and indeed generating data in different ways, which may have implications for the process of analysis.

Interviews, focus groups, diary entries and written communication such as letters generally result in text-based data, although both interviews and focus groups allow for analysis techniques that draw on the audio or video recordings of the data collection. The use of visual methods such as drawings and photography are becoming increasingly popular in research, particularly with children. DiCarlo and colleagues (2000) argues that drawings represent a universal activity that does not require literacy skills, while Walker (talking about photographs) argues that these methods "find ways of thinking about social life that escape the traps set by language" (1993, p. 72). The type of data generated may have implications for the method of analysis the researcher plans to use. It is particularly important to recognise the types of data you are working with when deciding on a method of analysis, particularly when a study has multiple sources or forms of data (e.g., focus groups where both the content of the

discussion and the interactions of the group are analysed).

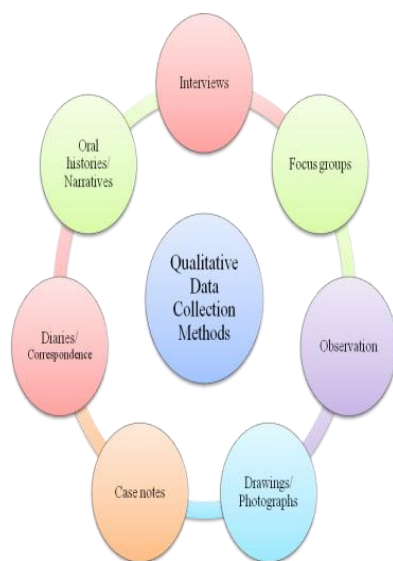


Figure 1: Methods of qualitative data analysis

Before we move on to consider some specific methods of qualitative analysis, it is possible to reflect on some of the general aspects of qualitative analysis. To begin, like the term quantitative data analysis, qualitative data analysis includes a broad range of methods, with variants reflecting different epistemological and methodological positions. However, there can be a challenge determining the exact differences between the various approaches and this can create difficulties for the researcher who needs to choose a method of analysis. Colin Robson (2002) captures the situation well saying that “there is no clear and accepted set of conventions for analysis” within the qualitative approach (p. 456). However, this process is made more complicated (and perhaps unnecessarily so) by the use of what Elliot and Timulak (2005) refer to as ‘brand names’ whereby common aspects of the methods are combined in ways that are presented as unique. Elliot and Timulak go on to describe

this practice as “confusing and somewhat proprietary” (p. 148), stressing the benefit instead of a more generic approach. Given the variation and debate in this area, the challenge is to make sure that the procedure by which the researcher makes sense of the data is systematic and transparent, to allow the reader to understand, evaluate and indeed replicate it.

Recognising the concerns of Elliot, Timulak and others, there are a number of methods of analysis regularly used by researchers. Despite the branding issue noted above, examples include Interpretative Phenomenological Analysis, Discourse Analysis, Grounded Theory, Narrative Analysis, Thematic Analysis and Content Analysis. Robson (2002) captures the range of methods using four categories, which are represented in Figure 2.

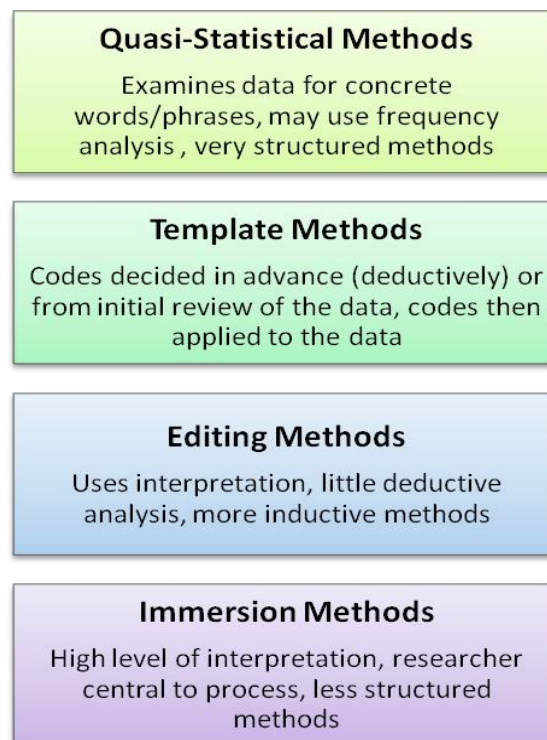


Figure 2. Framework for categorising qualitative analysis techniques from Robson (2002)

This categorisation considers whether the method uses deductive techniques (whereby the themes or codes are determined based on previous research or theory) or inductive techniques (whereby the themes are determined based on engagement with and interpretation of the data gathered). It also reflects the continuum of methods from structured techniques to unstructured techniques.

Considering Specific Analysis Methods

It would be impossible to consider all of the named methods used in published research. However, this article will examine four methods: Discourse Analysis, Grounded Theory, Thematic Analysis and Content Analysis. This section will consider the nature of these methods, and aims to highlight the similarities and differences in the techniques, before drawing on Elliot and Timulak's (2005) generic approach to highlight key elements of the process of analysing qualitative data. Specific resources will be mentioned in the sections below. However, for a very helpful introduction Howitt's (2010) 'Introduction to Qualitative Methods in Psychology' considers a number of common techniques.

Discourse Analysis

To begin with a somewhat circular definition, discourse analysis is concerned with analysis of discourses, which can be defined as written or verbal interactions or correspondences. Jonathan Potter and Margaret Wetherell have written extensively on the topic of discourse analyses (see for example Potter & Wetherell, 1994) and describe the key features of this approach such as recognising discourses as social practices and examining both the topic and the

linguistic form of the discourse. Howitt (2010) also captures key elements that include recognising that we use language to construct versions of our reality, and therefore examining the data to identify what reality may be represented in the discourse. However it is important to recognise that the term discourse analysis actually encompasses a number of discrete methods of analysis including critical discourse analysis (Van Dijk, 2001), sociological discourse analysis (Ruiz Ruiz, 2009), and discursive psychology (Potter, 2012).

Looking to some of the building blocks of discourse that can be examined by the qualitative researcher, Silverman (2001) identifies a number of elements including interpretative repertoires, which are related sets of terms that may represent idealised concepts the speaker aims to present, and scripts, which represent ways in which participants construct events they are talking about and typically reflect routine constructions of a narrative. Another key concept highlighted by Howitt, Potter and others is that of the stake. This represents the vested interest held by the speaker and Silverman argues that knowing the 'stake' a person holds in what they are saying can help us to interpret the discourse, which may be structured to minimise or maximise the stake. Looking to the mechanics of discourse analysis, Howitt (2010) captures and summarises the key steps (based on Potter, 2003). A summary of each of these stages are presented in Figure 3 below, though the reader is referred to Howitt's more comprehensive consideration.

An example of this method can be seen in Lindgren, Oster, Astrom &

Graneheim's (2012) study of interactions between women who self-harm and their paid caregivers. This study used observations and informal interviews of women in inpatient wards and their caregivers and the analysis involved the identification of interpretative repertoires. The findings highlighted different repertoires for each group: victim and expert for the self-harming group, and fostering and supportive for the staff group. In addition to providing an insight into the process of discourse analysis, this paper also provides an example of a clear description of the method of analysis presented.

Discourse analysis has become a popular method of analysis in health and psychology, with a literature search for the method highlighting its application to a wide range of subjects. It offers a clearly theory-driven

approach to understanding discourses and provides researchers with a way to examine the complexities of those same discourses. However, as with all methods, there are limitations to be considered. Landridge and Hagger-Johnson (2009) reflect on the strengths and limitations of this approach, noting criticisms such as the risk that the person at the centre for the discourse is lost as a result of the focus on the discourse itself, and the discussion regarding the individual as an 'active language user' (p.441). Nevertheless discourse analysis offers a unique method for the consideration of verbal and text-based interactions, though a researcher considering using the approach may need to reflect on the unique nature of the approach and its implications. Next, we move on to consider another well-developed method of analysis, grounded theory.

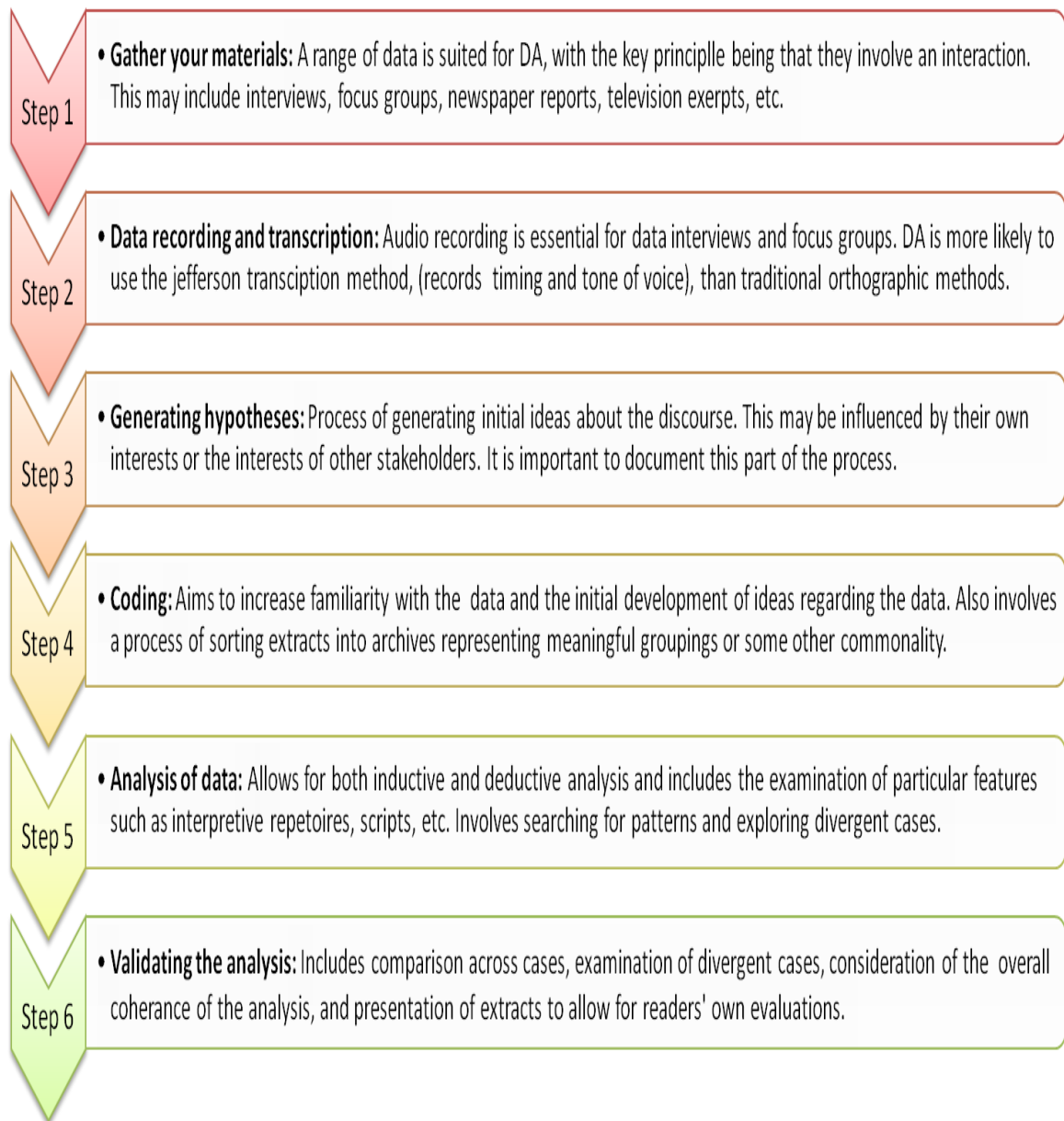


Figure 3. Key stages of discourse analysis outlined by Howitt (2010; after Potter, 2003)

Grounded Theory

Developed in the 1960s by Glaser and Strauss (1964, 1967) grounded theory was perhaps the first formal qualitative analysis technique (Howitt, 2010). Simply put, this approach “involves establishing a set of inductive strategies for the analysis of data” (Carlson et al, 2004, p.56). As with discourse analysis the term covers a range of techniques, based on variants that have developed since the 1960s. However, in contrast to discourse analysis this method is not strongly theory driven, and indeed for some proponents however the intention with this inductive, bottom up method is to develop a theory that explains the data.

The process of analysis used in grounded theory has been described in different ways, though a key component is the coding of data and a common framework for this element is presented in Figure 4 below, outlining the nature of open, axial and selective coding. In addition to these stages, the constant comparison method is a central component of this approach. According to Landridge and Hagger-Johnson (2009), this involves the examination of similarities and differences, between and within categories and cases. The researcher also aims to find negative cases, which provide an insight into the complexities of the data. Howitt (2010) also stresses the importance of going beyond the categories highlighted by the coding to test the findings against those identified in other data sets and settings so as to develop “a formal theory about a particular phenomenon” (p.206). It is interesting to note that Howitt feels that this stage of the process is not common in research using grounded theory.

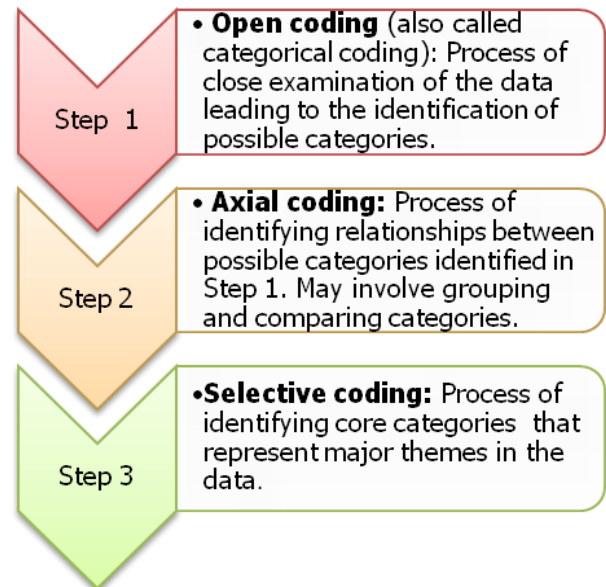


Figure 4. Key stages of coding in grounded theory as outlined by Howitt (2010)

Given its long history, it is not surprising to note the extent to which grounded theory has become part of the qualitative continuum of methods. However as noted above, there have been many developments in the approach and debate continues about its nature and application. Again, as with discourse analysis, it is important to identify the strengths and limitations of the method, to allow for an informed decision about its use. Howitt (2010) notes a number of strengths, including its contribution as one of the first well-developed qualitative analysis techniques and the fact that it presents as its foundation an approach to testing hypotheses and developing theory that is appropriate for qualitative research. In contrast, Landridge and Hagger-Johnson (2009) note that the ongoing debates about the approach represent a challenge, which may tie into the earlier quote from Robson (2002) regarding the lack of accepted conventions in qualitative analysis. Another significant limitation

noted by the authors is the failure to consider the role of language, which is a key feature of the previously considered method of discourse analysis.

Despite the ongoing debate and discussion, grounded theory *is* a very common method, and indeed in comparison to discourse analysis one might argue that the coding process is more concrete and therefore practical for the researcher working in an applied context. The preceding methods have an established identity as forms of qualitative analysis; however the same cannot be said for the following methods. The next section considers thematic analysis, which has been and continues to be the subject of debate as to its contribution to qualitative data analysis.

Thematic Analysis

Thematic analysis has been defined as “a method for identifying, analysing and reporting patterns (themes) within data. It minimally organises and describes your data set in (rich) detail” (Braun & Clarke, 2006, p.79) and the authors go on to clarify that “a theme captures something important about that data in relation to the research question, and represents some level of *patterned* response or meaning within the data set” (p.82).

In discussing this method, Howitt (2010) highlights some of the debate regarding the use of thematic analysis, noting a “lack of complexity” (p. 164), while Braun and Clarke (2006) note the lack of clarity regarding the method. However, Howitt sees its simplicity as a positive, with the method being suitable as an introduction to qualitative analysis,

while Braun and Clarke support its use as a pathway into other methods. The interested reader is directed to Braun and Clarke’s (2006) useful article, which captures the development, foundations and elements of this method. For the purpose of this article, Figure 1 captures the key stages of thematic analysis as outlined by Braun and Clarke.

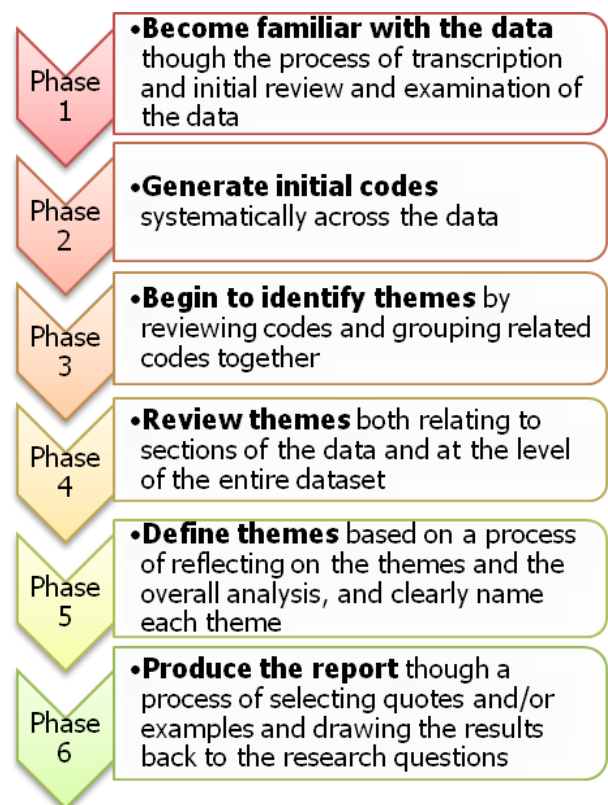


Figure 5. Key phases of thematic analysis from Braun & Clarke (2010)

There are a number of similarities and differences between thematic analysis and the preceding methods. For example both grounded theory and thematic analysis refer to the collapsing of initial codes into more refined themes or concepts. Braun and Clarke also comment on the use of thematic analysis in cases where there is a guiding thematic framework and where there is not, suggesting the use of inductive and deductive methods,

similar to discourse analysis but distinct from grounded theory.

Commenting on the strengths of this approach, Howitt (2010) notes that it is more accessible than other methods, particularly for novice researchers, the public, and indeed policy development. However, he does also note the challenge presented by variation in the use of the title thematic analysis, and particularly the variation in quality that can be seen in studies using this method. The issue of quality is one that is central to any method of analysis and Braun and Clarke (2006) provide a very helpful 15-point checklist that researchers should use to ensure that they are applying this method consistently and to a high standard. In addition the recent textbook by the same authors (Braun & Clarke, 2013) provides additional discussion of thematic analysis, helpfully situating it in the wider context of qualitative design and analysis.

Content Analysis

The final specific method of analysis considered is content analysis, yet it is interesting to note that this approach is not always seen as a method of qualitative data analysis. Indeed Elo and Kyngas (2008) provide an overview of its quantitative foundations and stress its flexibility as a method. They note that it can be used with either qualitative or quantitative data, with a range of types of data including interviews, documents and images, and that it allows for both inductive and deductive analyses. Simply put, content analysis involves establishing a set of categories/themes and applying these categories to the data (Robson, 2002). Robson goes on to stress that the

categories must be clear and precise and also mutually exclusive.

There are different descriptions of content analysis in the literature. For example, Elo and Kyngas (2008) outlined three phases; the preparation phase, the organising phase and the reporting phase. Figure 6 below outlines the stages of content analysis as used by Guerin and Hennessy (2002) in their analysis of children's definitions of bullying. Central to these steps is the consideration of sections or topics within the dataset. The aim here is to create a structure within which the key findings can be identified.

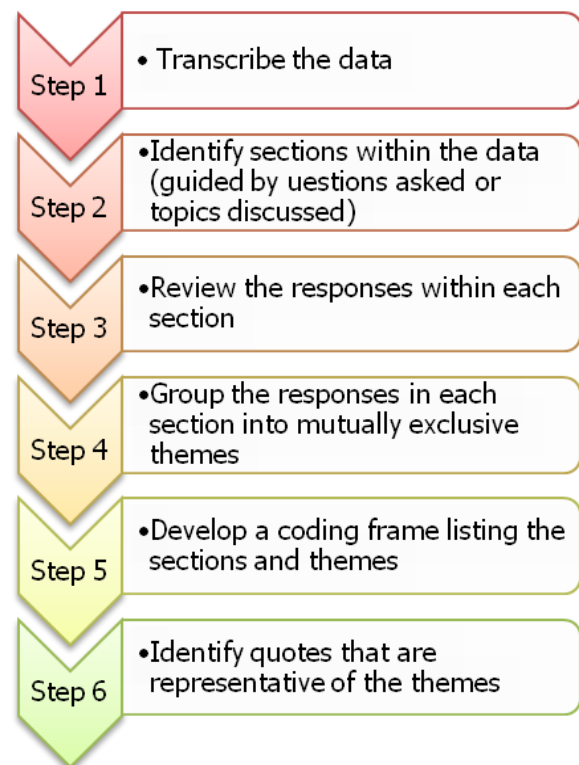


Figure 6. Key steps for content analysis from Guerin & Hennessy (2002)

Many of the strengths noted for thematic analysis can be applied to content analysis, particularly its simplicity and its accessibility. It is similar to both grounded theory and thematic analysis in the process of refining themes, and as with other methods, allows the researcher to examine the data for the presence of particular themes (deductive) and/or allows the emergence of inductive themes. However, Elo and Kyngas (2007) note that it is seen as too simplistic, and the quantity of information involved can also be challenging. A final challenge noted by these authors is the difficulty in moving beyond a consideration of categories to isolate more abstract findings. Nevertheless, the use of content analysis in many studies highlights its potential as a method of analysis.

Moving Beyond Brand Names

Having considered a number of types of qualitative data analysis, this article returns to the point from Elliot and Timulak (2005) considered earlier, the challenge of branding in qualitative analysis. As noted earlier, they stress the benefits of a more generic approach. Figure 7 below outlines the key stages of this approach.

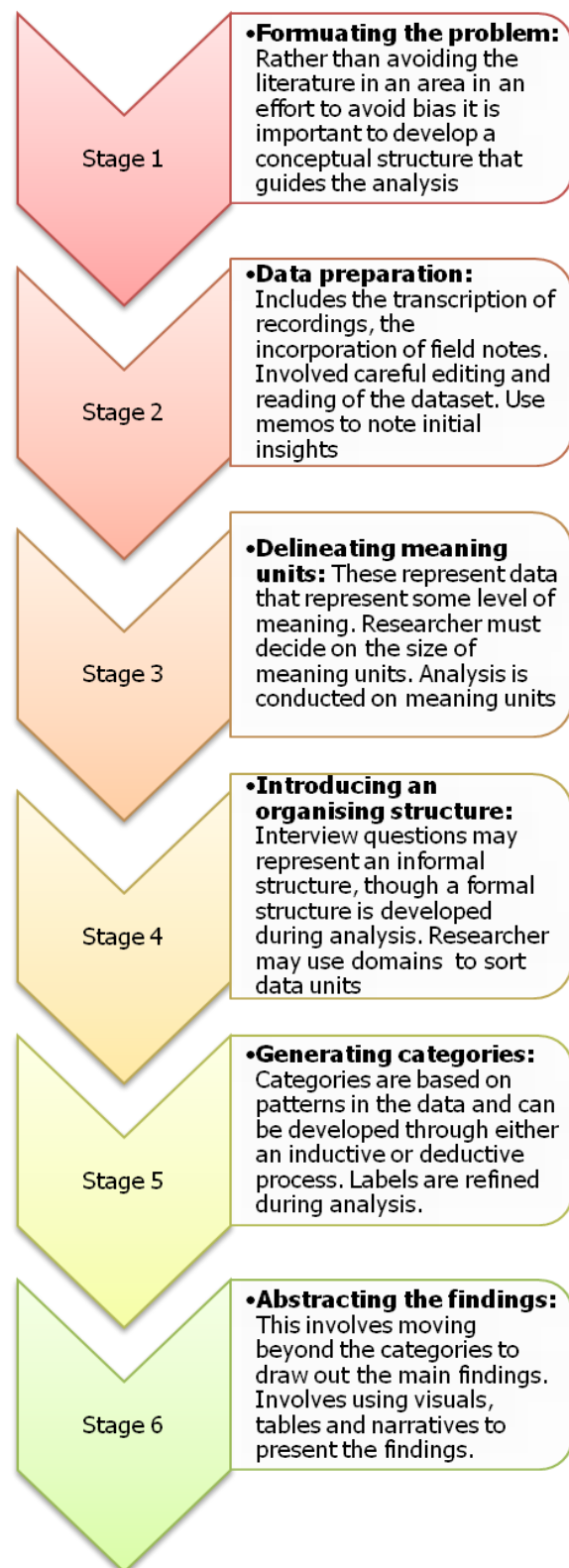


Figure 7. Key steps in qualitative analysis based on Elliot & Timulak (2005)

Reflecting on these stages in the context of the previous discussion of the different methods of analysis earlier in this article, the commonality of the stages proposed by Elliot and Timulak is clear. Clearly the preparation and initial review of data is a key aspect of analysis, as is the generation of initial codes or categories. It is interesting that this framework stresses the abstraction of findings, an issue that content analysis has been criticised for. As part of this generic approach, Elliot and Timulak stress the importance of validating the analysis, and this issue is considered in more detail later in this article.

A Note on Computer-Assisted Qualitative Data Analysis

In recent years there has been an increase in interest in, and programmes available for, conducting computer-based analysis of qualitative data. Programmes are available for analysing text and video-based data and include NVIVO, Hypertext, Atlas TI and Observer Pro. One of the most comprehensive resources for researchers interested in computer-based analysis is the CAQDAS Networking Project, which stands for Computer Assisted Qualitative Data Analysis Software (<http://www.surrey.ac.uk/sociology/research/researchcentres/caqdas/>). This project provides training and information on different programmes and issues in computer-based analysis.

A key debate in relation to the use of computer programmes is whether they represent an element of the analysis process or simply a tool to support the management. Bourdon (2002) discusses this distinction in some detail and considers some of the situations that are suitable for computer-based

analysis. Looking at the strengths and limitations of computer-based analysis, Welsh (2002) considers the example of NVIVO, a widely used programme. She notes some of the critiques of computer-assisted analysis such as creating a distance from the data, and encouraging a more quantitative approach and also notes the demands of developing competence with these programmes. However, Welsh also stresses NVIVO's contribution in terms of generating a more reliable picture of the data and the flexibility to allow for both inductive and deductive analysis. The debates regarding computer-assisted qualitative data analysis continue and it is the choice of the researcher as to whether it is appropriate or effective for a particular study.

Rigour in Analysis

Having considered a number of different approaches to qualitative analysis, the final section of this article reflects on a key aspect of analysis. Whether we refer to reliability, validity, trustworthiness or credibility, the debate regarding methods of ensuring rigour in qualitative analysis is central to qualitative research. Morse and colleagues (2002) note that some researchers have debated the relevance of these concepts to qualitative research. However Madill, Jordan and Shirley (2000) refer to the perception that "qualitative approaches can be criticised for the space they afford the subjectivity of the researcher" (p.1).

As a result of this debate many researchers have reflected on techniques which may address these concerns. Examples include the use of respondent validation (Elliot & Timulak, 2005), triangulation (Barbour, 2001) and methods for checking the reliability of coding (Guerin & Hennessy, 2002). Elliot and Timulak recommend an audit process throughout the analysis, with a major audit following the completion of the draft of the analysis. However, Barbour (2001) counsils against 'the tail wagging the dog' (p. 1115), and considers the use of coding and inter-rater reliability to be potentially problematic to a certain extent, noting concerns such as economy and resources and the tendency to focus on agreement rather than learning from disagreement.

In considering the need for checks and balances in qualitative analysis, the reader will find Elliot, Fisher and Rennie's (1999) excellent article on the publication of qualitative research studies a useful checklist. This article considers criteria that can be used to ensure the quality of research and a number are relevant to data analysis. For example, in discussing criteria for both qualitative and quantitative research, the *specification of methods* stresses the need for methods of data collection and analysis to be clear and transparent. Looking to Elliot et al's specific criteria for qualitative research, a number have implications for analysis. The need to own one's own perspective focuses on the researcher recognising their influence in the research process, and clearly the analysis process is one where this influence could be problematic. A criterion that is directly relevant to analysis is *grounding in examples*,

which stresses the need for quotes and other supporting examples. These examples help the reader assess the appropriateness of interpretations made. The criteria also stress the need to *provide credibility checks* such as triangulation with other methods or with the participants themselves. Finally researchers need to consider the *coherence of the analysis*, and this relates to the way in which the researcher balances the nuances of the data with an integrated framework or model representing the findings.

Despite the debates regarding the subjectivity (inherent or not) of qualitative research in general, and qualitative data analysis specifically, an awareness of rigour and credibility checks can only contribute to the research process. The challenge for the researcher may be to identify a method of enhancing credibility that is in line with their own approach to qualitative research and the method of analysis used.

Recommendations for Qualitative Data Analysis

Having reflected on methods of analysis and associated issues of credibility, this article concludes with a number of recommendations for researchers using qualitative research methods. A key requirement is that the analysis method chosen must be appropriate to the data gathered and the research questions posed. A method such as discourse analysis will only be suitable for particular questions, while thematic or content analysis may represent more flexible methods. Researchers should also be aware of the strengths and limitations of particular approaches, as already discussed above. For example, discourse analysis may place too much

emphasis on the interpretation of language, while the requirement for those using grounded theory to minimise expectations and biases can represent a challenge.

Perhaps the most important element of the analysis process is the choice, and indeed the informed choice, of a model of analysis. However, recognising Elliot and Timulak's (2005) concerns around brand names, it may not be a simple case of selecting a named method and perhaps the most effective model is the one that can be clearly described for the reader, whether the reader is a reviewer, an examiner, or an interested practitioner. Nevertheless, the methodological literature contains a range of resources that can guide the researcher in these key decisions.

The final recommendation relates to the challenge of subjectivity noted above. Given the nature of both qualitative research and qualitative data analysis specifically, it is essential that those taking part in research consider the factors that may undermine the research or indeed may contribute to the credibility of the process. Again there are a range of methods available to the researcher including triangulation and reliability checks. However, again the choice of verification techniques should be a considered and informed choice. One relatively simple solution may be a focus on transparency, both in conducting the analysis and reporting the findings, along with a commitment to provide examples that allow the reader an insight into the process of analysis and interpretation.

Conclusion

As stated at the outset of this article, the process of analysing qualitative data represents a complex process with few accepted conventions. Navigating the range of techniques and debates evident in the methodological literature may represent a challenge to less experienced researchers. However the solution to this challenge is informed choice and transparency.

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HOW TO APPLY SOCIAL NETWORK ANALYSIS CONCEPTS TO HEALTH AND SOCIAL CARE?

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Introduction

Social network analysis (or SNA for short) has emerged as one of the key computational social science methodologies in recent years that is increasingly applied to a wide variety of research domains and problems, and healthcare is no exception. In this paper, we will outline some of the key concepts underpinning SNA and show how they are particularly relevant to health and social care professionals working to improve services in an integrated, collaborative fashion, and in supporting the social needs of vulnerable groups. We will showcase some of the early work already done on applying SNA to healthcare in the Irish context, and provide a list of resources for people who are interested in exploring the methodology further.

Networks in Health and Social Care

Don Berwick (1998: 438), a renowned health policy expert, wrote that "the management of excellence in healthcare is the management of interdependency". The challenge posed by the management of interdependencies requires new ways

of looking at healthcare, including how we research problems in this field.

Much of health services research focus on testing interventions on the assumptions that these could be replicated in stable, formally prescribed environments, where actions and reactions could be largely and unproblematically specified. Yet organisational researchers increasingly look beyond formal institutions to focus on the dynamic interactions between individuals as the more valid ground for investigating organisational action, which may or may not take place along formal reporting structures, and operational procedures may or may not coincide with actual organisational practice. Instead of looking solely at formal structures, Allen et al (2002: 298) for example argues that an interactional view of organisations "conceptualises the division of labour in dynamic terms and makes social interaction between workers central to its concerns." In this view, "occupational boundaries are not self-evident but have to be actively established and re-established in response to the work situation."

Researchers adopting such an interactionist approach recognise that, whilst formal organisational structures, such as service level agreements, job descriptions, policies and procedures, provide the operational frameworks within which services are delivered, "much policy-making takes place at 'street level' where clients and service providers meet" (Allen et al., 2002: 298). Adopting a relational view of organisational life means that we are no longer satisfied with theories that focus solely on *attributes* – whether defined at the level of individual, team, organization or system – as the key

explanatory framework for organisational behaviour; rather, we are concerned also with the existence or otherwise of relationships between individual actors – and the patterns and quality of these relationships between them – as having important explanatory power to account for organisational outcomes.

Indeed, such networks of relationships, both formal and informal, increasingly reflect the way healthcare is organised. With integration being the driver behind much of the healthcare reforms around the world since the late 1990s (World Health Organisation, 1996; Bazzoli et al., 2001; Briggs et al., 2002), there is an increasing emphasis on re-engineering relationships and affiliations across health and social care at both individual and agency levels to arrive at better outcomes. Much of the health systems reforms under the banner of New Public Management at the end of the last century (Frederickson, 1996; Brusson & Sahlin-Andersson, 2000; Ferlie & Steane, 2002) were about re-organising discrete organisations into network structures, such as the hospital and primary care trusts in the UK (Pollock, 2001; Goodwin et al., 2004), or integrated healthcare networks or integrated delivery systems in the US (Darby, 1999; Schaffner et al., 1999; Friedman & Goes, 2001; Burns et al., 2001; Burns & Pauly, 2002).

At the service level, over the past two decades there has been a worldwide trend to develop integrated care pathways (Campbell et al., 1998; Kaltenthaler et al., 2001) to coordinate patient care across different disciplines, departments and care

settings. The rise of multidisciplinary teams in healthcare systems around the world witnessed around the same time (Cott, 2000; Scholes & Vaughan, 2002) is also a logical consequence of the decades-long trend of increasingly non-/anti-hierarchical ways of working across health and social care, which aimed to integrate services in ways that would provide seamless, holistic care to patients and public (Hunter, 1990; Heath, 1998; EQuIP, 2001; Krogstad et al., 2002; Lee, 2002).

In a review of the health management literature on organisational factors and performance, Sheaff et al. (2003: 13) assert that partnership-working between health and social care agencies involves a mode of co-ordination and decision-making that fits in with a specific type of governance structure known as “networks”, and that network analysis would be a fruitful way in which such co-ordination and shared decision-making could be explored by future researchers.

About a decade after Sheaff and his colleagues (2003) initial call for more network analysis to be conducted on the organisation of healthcare, a systematic literature review on social network analysis research on healthcare teams (Cunningham et al., 2012) found that, from January 1995 to December 2009, over half (54%) of the identified SNA studies were published between 2005 and 2009, attesting to the application of SNA in health services research as a very recent phenomenon.

However, the development of network research and network analysis methodologies is a field that traces its roots back to the 1960s, and has its

philosophical foundation in structural sociology (Watts, 2004; Kilduff and Tsai, 2009), and aided by the incorporation and development of network mathematics (graph theory, and models and theories drawn from complexity science)¹².

Network analysis techniques have been adopted by epidemiological researchers since the 1980s (e.g. Klodahl, 1985; May and Anderson, 1987), and the insights gleaned into the spread of infectious diseases from these pioneering studies helped develop what became known as “network epidemiology” (Morris, 2004; Danon et al, 2011) or the “network model in epidemiology” (Lloyd and Valeika, 2005; Luke and Harris, 2007), which reviewed the adoption of SNA methodologies in public health research particularly in the field of communicable diseases such as HIV/AIDS.

Since the 1990s, SNA is increasingly adopted by health services researchers to investigate intra- and inter-professional coordination and collaboration within and across healthcare settings (e.g. Cott, 1997; Scott et al., 2005; Creswick et al., 2009; Goodwin, 2010; Battilana and Casciaro, 2012, Uddin et al, 2013).

¹² As Lin Freeman, a key author in the SNA field, writes, “From the outset, the network approach to the study of behaviour has involved two commitments: (1) it is guided by formal theory organized in mathematical terms, and (2) it is grounded in the systematic analysis of empirical data. It was not until the 1970s, therefore--when modern discrete combinatorics (particularly graph theory) experienced rapid development and relatively powerful computers became readily available--that the study of social networks really began to take off as an interdisciplinary specialty.” (www.insna.org)

Over the past decade, social network analysis has gained increasing momentum amongst health service researchers as a welcome addition to their methodological repertoire (Cunningham et al, 2012), with introductory guides published in authoritative healthcare journals in the last few years (e.g. Blanchett and James, 2012), and increasing international collaboration on the subject (see Resources list for more information). Here we sketch some of the key concepts of SNA to show how they are applicable to health and social care professionals conducting health services research, which are based on our own research experiences, since 2006, in a series of research projects that applied SNA to a variety of Irish healthcare settings (Ackermann, 2007; Murphy, 2008; O’Doherty, 2008; Finn, 2009; Lee et al, 2009; Lee et al, 2013, Lee and Ezumezu, 2014).

What is Social Network Analysis?

The central tenet of network research is that actors are embedded in networks of interconnected social relationships that offer opportunities for, and constraints on, their behaviours (Brass et al., 2004: 795), and which in turn influence the maintenance and/or change of existing social structures. There are differing levels of analysis when it comes to conceptualizing organisational actors – at the individual level, at the intra-organisational (team) level, at the organisational (agency) level and at the inter-organisational level.

At whichever level of analysis an organisational actor is being defined, SNA is useful for capturing quantitative aspects of relational patterns and making explicit and measurable formerly tacit, informal relationships

between actors, which is helpful in exploring interactions that cross functional / structural boundaries and take place outside of formal channels within and across organisations. In this way SNA enables “managers to visualize and understand the myriad of relationships that can either facilitate or impede knowledge creation and transfer” (Parker et al., 2001: 26).

SNA supports a conception of inter-relationships between individuals as those that can enhance or constrain individuals' access to valued resources (Balkundi & Harrison, 2006; Morton et al, 2004), maximize their contacts, help them to gain skills, or optimise their chances of success (Savage et al, 2005). Network research has shown that the interconnectedness of relationships between actors can influence behaviours through providing opportunities and inserting constraints (Brass et al, 2004).

Key Conceptual Shifts Required in Social Network Analysis

SNA researchers deal in similar data collection methods as traditional researchers – they obtain information through qualitative (e.g. interviews, participant observations) as well as quantitative (e.g. survey questionnaires, extraction from routinely-held organisational data) methods, and indeed often both. The key difference between SNA and more standard social science research is in the *analysis* of the data and the assumptions they hold about the social phenomena under investigation. Here we outline several key paradigm shifts that differentiate network analysis from more standard social scientific investigations:

From Fixed, Stable Attributes to Dynamic, Relational Patterns

Network research focuses on the relations or ties between actors, as opposed to solely concentrating on the attributes of the individual actor. This means that, rather than basing our explanations solely on variables related to the inherent and/or stable properties of the individuals under investigation – be it demographics (age, gender, ethnicity), socio-economic class, physical capacity, psychological traits/ personality profiles, knowledge, skills or capabilities, length of service to an organisation, disciplinary background, etc. etc. – we examine also the position an actor occupies within their social milieu and the connections or lack thereof between them and other individuals, in order to arrive at a fuller and more nuanced view as to why an actor behaves the ways they do.

An example to illustrate the power of this shift to relational rather than attributional thinking – essentially working with nodes-and-links in our analysis rather than only with variables – is when we examine smoking behaviours of young teenagers. If our evidence points to the high incidence of smoking amongst teenaged individuals, with young age itself being the key explanatory variable as to the uptake of smoking amongst individuals in a population, it is not a factor that can be manipulated to combat smoking-related ill-health since being young is a necessary stage of the human life course. Other research may point to the socio-economic background being a factor, or gender being a factor, or certain psychological traits being a factor in the uptake of smoking amongst the young, but these

again point to stable or inherent characteristics of a population that are not possible or undesirable to change.

However, when we examine the problem from a relational, connectionist perspective, we would realise that smoking is a culturally patterned behavior amongst groups of interacting teenaged individuals, and it is in the patterning of social relations amongst teenagers that inculcate certain attitudes conducive to the uptake of smoking and induce the peer pressure on individuals to perpetuate the behaviour. Thus, the key drivers behind smoking amongst teenagers may not simply be because they have certain demographic properties (young, or from poor socio-economic backgrounds), or even that they lack knowledge about the risks of smoking-related diseases, but that smoking is deemed as an acceptable social norm between groups of interacting teenagers within their social milieus (Ennett and Bauman, 1993; Ennett and Bauman, 1994; Aloise et al, 1994; Alexander et al, 2001). Challenging these norms could involve blanket health promotion campaigns targeted at the young, but they could also involve more targeted interventions by finding out the opinion-formers amongst particular teenaged social groupings who have an influence on shaping these norms; or investigating whether subgroups exist in “smoking cultures” amongst the young; or mapping the type and frequency of interactions that are helpful to counter-act peer pressures; or identifying the type and frequency of support that are helpful to young people who wish to quit, etc. All of these latter questions could be fruitfully investigated by SNA where relational, rather than attributional

thinking, is employed, and from which “social network interventions” can be designed to complement traditional clinical interventions (e.g. Haring and Breen, 1992; Mulroy, 1997; Broadhead et al, 1998; Knowlton et al, 2003; Latking et al, 2003; Valente, 2012).

In fact, such relational thinking is crucial to tackling major public health challenges, not only in the field of infectious diseases such as HIV/AIDS as previously highlighted, but also “socially communicable” diseases such as obesity (Christakis and Fowler, 2007), with social network analysis making valuable contributions to our understanding of the spread of social norms that influence health behaviours (Luke and Harris, 2007). More fundamentally, beyond disease transmission, the network paradigm and the relational view are central to our understanding of social support networks that enables individuals to lead healthy and active lives (Berkman, 1984; Faber and Wasserman, 2002; Luke and Harris, 2007; Wrzus et al, 2013).

From Populations of Individuals to Networks of Interacting Agents

Social networks provide a direct link between individuals and the social structure they are embedded in (Berman et al., 2004: 218). Network theory, as mentioned, adopts a systemic, connectionist view of the organization, acknowledging the importance of social relations in explaining organisational behaviours and outcomes at both individual and group levels. According to the network perspective, actors are embedded within networks of interconnected relationships that influence behaviour (Brass et al., 2004).

Accordingly, instead of predicating our explanations on a predefined population of interest and sampling enough individuals to test our hypotheses that will hold in the larger population, social network analysis predicates its explanations within the context of a specific group of interacting individuals themselves. In such a framework, a sample size of 5 would provide enough explanatory power to map and quantify relationships if that constitutes the total number of individuals composing the known network, since network mathematics based on graph theory are not constrained by the usual caveats in sample sizes that underpinned standard probability sampling.

In addition to whole-network sampling (where all individuals within a known network are sampled), network sampling (also known as snowball-sampling or respondent-driven sampling) is an important sampling method in situations when there is a “hidden” population with no known sampling frame, or where the network is largely informal and dynamic with no known / predefined boundary (Salganik and Heckathorn, 2004).

Seen from the above, the network perspective allows us to unpack the “black box” of social interactions, helping us draw out precise linkages between actors as they engage in socially-patterned health behaviours, or in collaborative group activities, as will be discussed below.

Applying Network Analysis in the Context of Multidisciplinary Teams in Health and Social Care

In addition to its adoption by public health researchers, SNA is also widely

used in organisational settings to look at the nature of networks at macro, meso, and micro levels (Borgatti and Foster, 2003).

The advent of multidisciplinary teams in healthcare places an explicit demand that health and social care providers work collaboratively together in service delivery. The term “collaboration” conveys the notion of sharing and implies collective action towards a common goal in a spirit of trust. The extent to which team members from different disciplinary backgrounds are able to achieve real collective action and collective responsibility explains the various prefixes that have been attached to teamwork in healthcare organisations. “Multi-disciplinary”, “inter-disciplinary”, and “trans-disciplinary” are often used to preface “teamwork” to signify the degree to which collective action takes place in healthcare.

Multidisciplinary teams are responsible for much of the work done now in health and social care organisations, where clinical teams form the main vehicle through which services are provided (D’Amours et al., 2005, Nicholson et al., 2000). D’Amours et al. (2005: 144) points out that the success or otherwise of inter-professional collaboration in healthcare organisational settings is dependent on three groups of determinants: the interactional or interpersonal processes between the professionals; the organisational determinants; and the systemic or external determinants. Social network analysis is an excellent tool to investigate the first group of determinants: the interactional processes amongst team members.

Previous studies on multidisciplinary teams in healthcare had concentrated mainly on establishing the benefits of teamwork, conceptualised in terms of team-level performance outcomes (e.g. task completion) and individual team member outcomes (e.g. job satisfaction). Such intervention studies, where outcome measures are the key findings, commonly assumes that the intervention itself – in this case multidisciplinary teams – is a homogeneous, standardised entity that could be uniformly applied across the population of interest.

Rather than conceiving of collaboration from a structural-functional phenomenon, the relational view of organisations means that inter-professional collaboration is seen first and foremost as a process (see e.g. Liedtka & Whitten, 1998 who refer to collaboration as specifically a process of joint decision-making; and Thomson & Perry, 2006, who refer to collaboration as a long-term integrated process in which members jointly explore issues and search for solutions together). A process view of collaboration requires a research design that can adequately explore both the “hard” aspects of membership structures and task and work flows; as well as the “soft” aspects regarding advice-sharing and other informal exchanges amongst team members.

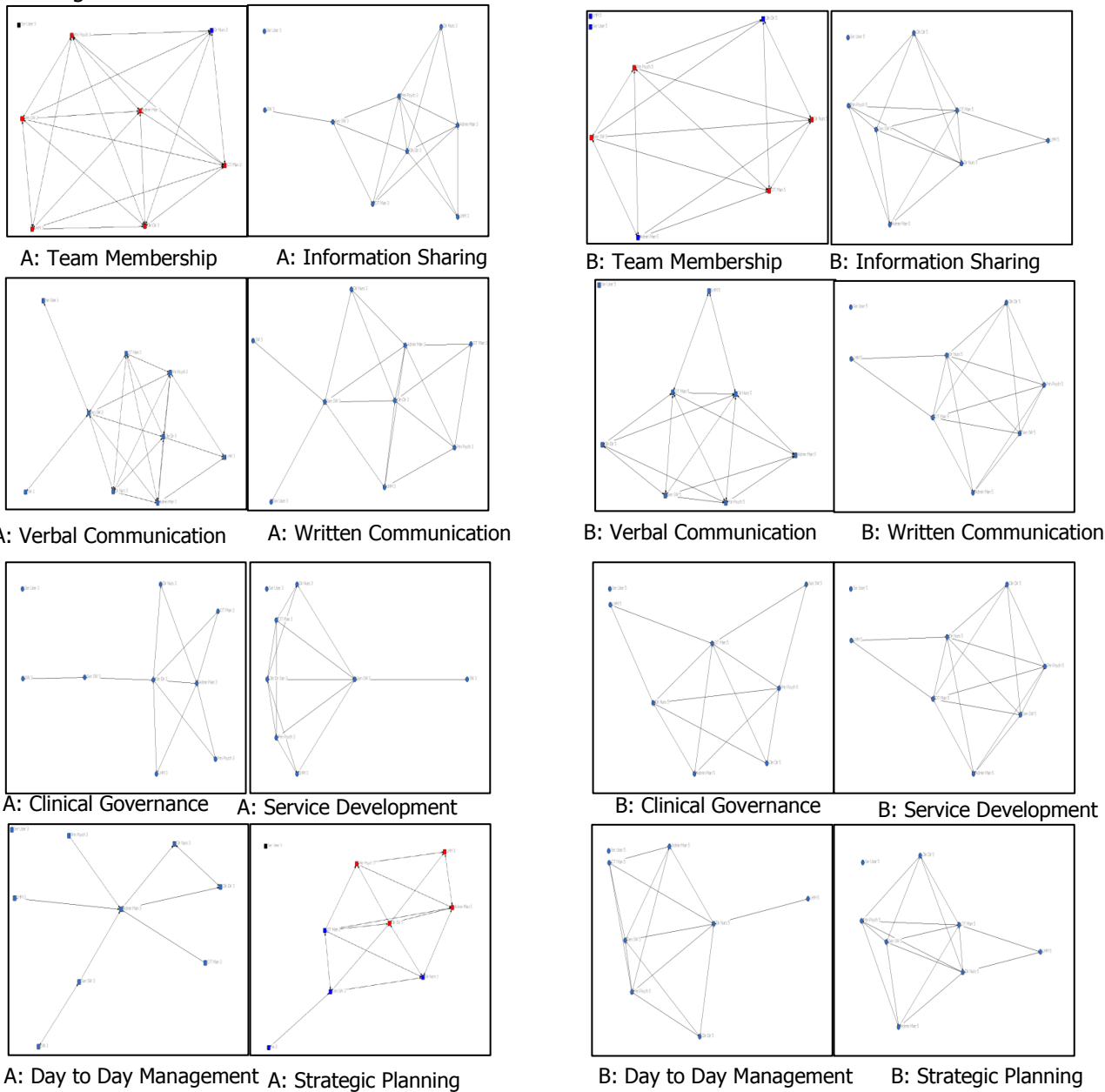
SNA is thus an important tool for understanding the nature of organisational teamwork, by revealing the structure of informal relationships amongst members unreported in standard organisational charts (Molina, 2001; Walstrom, 2003), and show how such relations facilitate or impede collaborative tasks and other team

performance outcomes. As Balkundi & Harrison (2006) suggest, the pattern of informal connections (ties) among individuals can have important implications for teams because they have the potential to facilitate or impede the flow of resources such as information between and within teams.

At the group level, the graph-theoretic visualisations afforded by SNA helps us reveal the nature of informal networks that underpin much of organisational life, and provides quantifiable evidence for the existence or otherwise of a core-periphery structure, or the existence of cliques or sub-groups (see Figure 1 and 2 for examples for these visualizations drawn from our own studies).

At the level of the individual, SNA helps to identify key players in a network, such as those occupying gate-keeping/ brokerage/ boundary-spanning roles, as well as reveal peripheral, underused or excluded members (Rosenthal, 1997; Parker et al., 2001; Parkhe et al, 2006; Lee et al, 2009; Creswick et al, 2010).

Figure 1: Different network structures underpinning the informal collaboration networks amongst multidisciplinary team members of the mental health management teams



SNA also provides a way of objectively assessing group cohesion through a variety of network measures, and allows for the identification of key players using a range of node-level centrality measures. In addition, SNA allows researchers to objectively assess the correlation between different types of informal network structures (e.g. the extent to which the decision-making network is structurally equivalent with the information-sharing network) (Lee et al, 2009).

As Cott (1997: 1412) says, when using SNA to study teams, “one is interested, not in how team members are categorised according to their professional affiliation or job title, but rather in the similarities in their patterns of relations with other team members”. Our own SNA research into multidisciplinary interactions in a variety of Irish healthcare settings (Lee et al., 2013) have found something very similar, showing not only that the actual multidisciplinary collaborative work occurs often outside of formal organisational boundaries, but also that the formal organisational restructuring of distinct disciplines into multidisciplinary teams might not guarantee that day-to-day collaboration will indeed take place amongst disciplines, and that informal, day-to-day practices need to catch up to formal structures in order to ensure genuine interprofessional collaboration to take place.

Network analysis (both visual and statistical), when combined with standard statistics as well as qualitative data, have shown us the nuances of inter-professional interactions within each team and setting, helping us achieve a much

more rounded view in the depiction of multidisciplinary teamwork than relying merely on attribute, network or textual data on their own could achieve. Such enhanced understanding of the specificities of a multidisciplinary team in an applied setting could prompt more meaningful and relevant interventions (Sparrowe et al, 2006; Van Wijngaarden et al, 2006).

Conclusion

Social network analysis is an exciting area of research and there is a growing international movement amongst researchers from all disciplines and academic fields on developing the methodology. Informed by network theory, SNA helps to reveal the structure of the informal networks that underpin organisational life, e.g. the existence of core-periphery structure, and/or the existence of cliques or sub-groups.

Through our own research studies on applying SNA to the study of multidisciplinary teams in Irish healthcare, we conclude that SNA brings to the study of health and social care with the following distinct advantages over standard variable-based social scientific accounts:

- Reveals hitherto “hidden” connections between organisational members as they engage each other in different types of activities: e.g. information-sharing, joint decision-making, advice-seeking, etc. which are seldom reported in formal organisational charts.
- Reveals in quantifiable terms the existence and shape of the structures of these informal social networks amongst organisational members, e.g. core-periphery structure, cliques or subgroups, and network isolates.

- Provides a way of objectively assessing cohesiveness of the team and its centralisation through a variety of network measures.
- Provides a way of objectively assessing individuals' importance within the team through a variety of node-level measures.
- Provides a way of objectively assessing the structural similarity or dissimilarity between members' ideal team structure and their current realities, such that individuals' (or individual disciplines') complaints regarding the lack of genuine parity of esteem can no longer be dismissed out-of-hand as purely anecdotal / conjectural / subjective.

Further SNA Resources

Introductory Texts in Popular Press or Online Primers

Barabasi, A. L. (2002). *Linked: How Everything Is Connected to Everything Else and What It Means for Business, Science, and Everyday Life*. New York: Plume.

Berkman, L. (2010). *Social Networks and Health*. Presentation to the World Health Organisation, Geneva, June 2-4, 2010. [URL: http://www.who.int/healthinfo/15_Social_Networks_Berkman_ok.pdf]

Harvard HealthBeat. (2011). *Social networks and health: Communicable but not infectious*. [URL: <http://www.health.harvard.edu/staying-healthy/social-networks-and-health-communicable-but-not-infectious>]

Recommended Academic Texts

Kilduff, M. & Tsai, W. (2009). *Social Networks and Organisations*. Los Angeles, CA: Sage Publications.

Knoke, D. & Yang, S. (2008). *Social Network Analysis*. (2nd ed.) Sage Publications.

Wasserman, S. & Faust, K. (1994). *Social Network Analysis: Methods and Applications*. Cambridge: Cambridge University Press

Morris, M. (2004). *Network epidemiology: A handbook for survey design and data collection*. Oxford University Press.

International Collaborations in Social Network Analysis Research

INSNA (International Network for Social Network Analysis)

[URL: www.insna.org]

Socnet (an online listserv operated by INSNA with methodological discussions and news about SNA meetings)

[URL: <http://www.insna.org/socnet.html>]

SNAandEthics Blog (with resources list for SNA researchers working in the health and education fields)

[URL: <https://snaethics.wordpress.com/resources/>]

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EVALUATING CLINICAL SERVICES WITHIN THE HEALTH SYSTEM: AN INTRODUCTION

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Introduction

Health services are increasingly required to provide evidence demonstrating that they are meeting the highest standards of quality while providing value for money. This evidence is required for senior managers, government departments and an informed public. A key challenge for health services is to develop the widespread capacity to gather this evidence, publish a report and act on the recommendations in a credible and authoritative way. There needs to be a transition within the health service from a reliance on anecdotal testimony to the use of formal service evaluations that provide comprehensive and reliable information. The aim of this paper is to provide a practical guide on the formulation and implementation of a service evaluation within our health service.

What is a service evaluation?

Service evaluations can be distinguished from other types of research on a number of key dimensions (Health Research

Authority, 2013; see Table 1). With regard to research aims, a service evaluation will be primarily focused on how a service is performing and will not seek to generate new knowledge that is independent of the context of the evaluation. With regard to research design, a service evaluation will examine a service without any manipulation of its routine functioning. There will be no random allocation to treatment groups or the control of third variables. Lastly, a service evaluation will only examine interventions already in use by the service. With regard to clinical audit, this form of research will have many characteristics similar to service evaluations. However, clinical audits will tend to focus on whether a specific performance indicator meets a predetermined standard, with the audit process repeating until the service reaches the required standard.

Service evaluation process

This practical introduction will discuss the stages of a service evaluation, from the initial planning and design concerns to the production of the report. The various theoretical and practical challenges that may emerge during the course of an evaluation are also discussed.

Table 1: Characteristics of research, service evaluations and clinical audits

Research ^a	Service Evaluation	Clinical Audit
<ul style="list-style-type: none"> Discover generalisable new knowledge 	<ul style="list-style-type: none"> Determine current level of service performance 	<ul style="list-style-type: none"> Determine if service reaches standard on performance indicator
<ul style="list-style-type: none"> May involve allocation to intervention or control groups 	<ul style="list-style-type: none"> Will not involve allocation to intervention or control groups 	<ul style="list-style-type: none"> Will not involve allocation to intervention or control groups
<ul style="list-style-type: none"> May involve randomisation 	<ul style="list-style-type: none"> No randomisation 	<ul style="list-style-type: none"> No randomisation
<ul style="list-style-type: none"> May involve introducing and testing a new intervention 	<ul style="list-style-type: none"> Intervention will already be in use by service 	<ul style="list-style-type: none"> Intervention will already be in use by service

^a Refers to a generic class of research distinct from service evaluation and clinical audit.

Step 1. Choose the dimensions of evaluation

There are multiple dimensions of performance on which a service may be evaluated (see Table 2). The dimensions chosen will be influenced by factors such as the initial motive for conducting the evaluation and the objectives of the service. For example, a primary care service managing a large volume of service users (SUs) may be concerned with accessibility, efficiency and equity as well as effectiveness. In comparison, an evaluation examining a specialist secondary or tertiary care service may be primarily concerned with effectiveness. A robust evaluation however will typically assess multiple dimensions and contribute to improving the quality of a service as a whole. In addition, government departments are increasingly requiring services to demonstrate value for

money, while the public are increasingly demanding services that have high acceptability (e.g., patient-centred care) and accessibility.

As a general rule of thumb, the dimensions of an evaluation will reflect a service's objectives (e.g., provide a recovery-orientated service). That is, an evaluation of a service should take each service objective and examine the extent to which this objective is being attained, and the factors that facilitate or impede attainment. Where a service has emerged organically and does not have clear objectives, experienced evaluators will often advise services to first prepare for an evaluation by developing a detailed Service Plan/Operational Plan. This document will set out specific objectives and how these objectives will be evaluated, in turn forming the reference document for the evaluation.

Table 2: Dimensions of healthcare quality (Kelly & Hunt, 2006).

Dimension	Description	Indicators
Acceptability	<ul style="list-style-type: none"> The degree to which a service provides a positive experience for SUs / carers. 	<ul style="list-style-type: none"> Satisfaction surveys; SU involvement in service planning; management of SU complaints or feedback.
Accessibility	<ul style="list-style-type: none"> The ease with which the service may be reached and treatments accessed; may relate to physical, financial or psychological access. 	<ul style="list-style-type: none"> Size of waiting lists across different care groups, socio-economic areas and geographic regions.
Effectiveness	<ul style="list-style-type: none"> The degree to which a service is achieving its strategic goals. 	<ul style="list-style-type: none"> Achievement of desired intervention outcomes; adhering to best-practice guidelines.
Efficiency	<ul style="list-style-type: none"> The system's optimal use of available resources to yield maximum benefits or results. 	<ul style="list-style-type: none"> The use of human, technological or monetary resources needed to produce a given output.
Equity	<ul style="list-style-type: none"> The extent to which a system deals fairly with all concerned. 	<ul style="list-style-type: none"> Distribution of SUs based on factors such as their socio-economic, geographic, or diagnostic profile.

Step 2. Determine level of service performance to evaluate

Once the objectives of the service and the dimensions of evaluation have been clarified, there is need to determine the level of service performance to evaluate. In this respect the *Program Logic Model* provides a useful framework, profiling the causal pathway from service resources to service effects (McLaughlin & Jordan, 1999; See Table 3).

Evaluating inputs

Inputs are the first level of the program logic model and refer to the resources available to the service including staff, financial resources and technological resources. Evaluating inputs can be valuable to the evaluation in two main ways. First, inputs can provide an insight into the achievement or non-achievement of service outputs. For example, are there enough staff to keep the waiting list below a specified level? The second value of inputs with regard to evaluating efficiency is their use in calculating cost-effectiveness and cost-utility. Cost effectiveness can be calculated by comparing the costs of the service (e.g., staff, technology, administration) with the potential cost savings of the service (e.g., medical cost-offset, employment facilitation). Cost utility may be evaluated by calculating the projected cost needed to achieve an increase of one standardised unit of health, typically a Quality Adjusted Life Year (QALY; Twomey, Byrne & McHugh, 2013).

Evaluating outputs

Outputs refer to the services provided and the level of service activity achieved. For example, a service may

seek to offer an assessment to all referrals within a certain time period or achieve a specified caseload level. Services may often have standards for output that may be identifiable through an operational plan. Where no standards exist, they can be agreed upon at the outset of the evaluation through consultation with stakeholders, funders and service providers, and/or via a review of the literature (Worrall et al., 2002). Alternatively, the chosen standards may be based on the performance of other services (i.e. benchmarking; Hermann, Chan, Provost, & Chiu, 2006).

The service outputs that are evaluated should be specific (i.e., clearly defined); measurable; achievable; relevant (e.g., aligned with strategy); and time-framed (SMART; Armstrong & Baron, 2005). Nonetheless, it is important not to bias the evaluation towards outputs that are easy to measure but that may not be particularly meaningful in the context of the service. For example, an excessive focus on administratively convenient factors to measure, like waiting times, may lead to a distortion of clinical priorities and excessive rigidity in organisational routines (Goddard & Smith, 2001).

Table 3. Level of service to evaluate performance.

Level of service	Description	Examples
<ul style="list-style-type: none"> • Inputs 	<ul style="list-style-type: none"> • The resources available to the service 	<ul style="list-style-type: none"> • Are resources sufficient to achieve outputs? • Cost-effectiveness & cost-utility
<ul style="list-style-type: none"> • Processes 	<ul style="list-style-type: none"> • The factors that contribute to, or impede, the attainment of outputs and outcomes 	<ul style="list-style-type: none"> • Level of teamwork • SU-centred care
<ul style="list-style-type: none"> • Outputs 	<ul style="list-style-type: none"> • The services provided and level of activity achieved 	<ul style="list-style-type: none"> • Care plans developed for each SU • Case throughput • Interventions provided
<ul style="list-style-type: none"> • Outcomes 	<ul style="list-style-type: none"> • The direct benefits for Sus 	<ul style="list-style-type: none"> • Proportion recovered • Improvements in well-being
<ul style="list-style-type: none"> • Impacts 	<ul style="list-style-type: none"> • The long term effects for the health service and the wider community 	<ul style="list-style-type: none"> • Cost-savings for health service • Improved shared care • Reduced stigma

Evaluating Outcomes

Outcomes refer to the direct benefits of the service for users. This may involve the proportion of SUs showing clinical recovery, enhanced wellbeing or increases in everyday functioning. As with service dimensions, it is important to examine a range of outcomes in order to more comprehensively assess the range of benefits for SUs (Hansson, 2001). For example, there is a growing need within our mental health services to examine those outcomes associated with the recovery approach, including the achievement of personal goals and increased community engagement (Anthony, 2000). When evaluating the outcomes observed, comparisons may be made with previous performance, or with the benchmarks of other services (Delgadillo et al., 2014). Furthermore, there is an increasing need to evaluate outcomes in terms of

the inputs that were needed to achieve them (i.e., whether outcomes are achieved in a cost-effective way).

Evaluating processes

Evaluating service processes can provide a valuable insight into how outputs and outcomes were achieved (Robson, 1993). For example, in seeking to provide a multidisciplinary care plan for all SUs, the quality of communication and decision making procedures at team meetings could be evaluated. While processes are often thought of in terms of how outputs are achieved, they can also provide an insight into how outputs translate to outcomes. For example, the way staff communicate with a SU about their treatment (e.g., simple, respectful) may have a significant impact on their treatment outcome. Evaluating processes can have particularly utility when outputs or outcomes are not as expected (McNamara, 2002). For example, poor service protocols may

explain why performance outputs were not achieved and can provide a basis for targeted service improvements.

Evaluating Impacts

In certain contexts it may be of interest to examine the longer-term, broader effects of a service, referred to as impacts (Knowlton & Phillips, 2013). For example, a primary care service with high accessibility may reduce the number of SUs seeking more specialist treatment, thereby enhancing the capacity of such services through reducing inappropriate referrals. It should be noted that impacts can also be cultural, such as a service helping to reduce stigma around mental health through community talks and activities.

Step 3. Decide if prospective or retrospective

A service can be analysed either as it functioned, or as it is currently functioning. These two types of approaches are respectively referred to as retrospective and prospective evaluations. Retrospective evaluations involve looking back at the performance of the service between two specified points in time. Here the evaluator is reliant on the quality of the data routinely held by the service, and the ability of providers to accurately report events within that time period. With a prospective evaluation, the data is collected as the service operates. Here the quality of the evaluation can be increased by the evaluator and the service agreeing on a number of prior goals, including the method of data collection, the type of measures administered and the time frame. Due to the higher level of quality, funders are increasingly

requiring prospective evaluations, as with many EU-funded projects.

Step 4. Decide scope

While a comprehensive service evaluation will look at numerous dimensions and levels of performance, the scope of an evaluation may be limited by a range of factors. For example, the type of service performance evaluation will often be based on data that is easiest to access (Gilbody, House, & Sheldon, 2002), such as that which is available in local and comparative databases (i.e., routinely collected data). If the available data cannot meaningfully answer whether the service is meeting its objectives, a prospective evaluation may need to be conducted with a wider data set. Other limiting factors can include the time clinical staff can spend assisting the evaluation (e.g., collecting data) and funding pressures that will limit the technological resources or external supports that can be accessed. When faced with such limiting factors, the complexity of the evaluation may need to be reduced, with a focus on a narrow set of performance indicators most relevant to the goals of the service (U.S. Department of Health & Human Services, 2010).

The target audience may also influence the scope of the evaluation. For example, if the goal of an evaluation is to inform a few key decision makers (e.g., a HSE National Director or Divisional Team member), it may be beneficial to consult with that individual when designing the evaluation. In such cases this individual may request a short report from the evaluator based on a narrow suite of performance indicators. Alternatively, an evaluation targeting a

broader audience will likely cover a wider range of dimensions. For all evaluations, it is important to seek input from the various stakeholders in determining the scope and content. This will additionally help to promote ownership of the evaluations.

Service Evaluation Example: Access to Psychological Services Ireland

Access to Psychological Services Ireland (APSI) is a primary care adult psychological service provided in County Roscommon (McHugh, Gordon & Byrne, 2014). Ease of access to this service is provided through a "Walk-in Clinic", a next-day assessment for all new referrals and the location of mental health practitioners in each of the six primary care team areas in Roscommon. Using a stepped care model, a range of low-intensity, high throughput psychological therapies are provided including guided self-help, computerised cognitive behavioural therapy (cCBT) and psycho-educational groups.

The objectives of APSI are to provide a service that is accessible, effective and cost-efficient. APSI evaluates whether it achieves these standards in the following ways:

1. **Accessibility:** The ease with which members of the public can access the service is measured by the output of whether all new referrals are offered a next-working day assessment.
2. **Effectiveness:** The clinical effectiveness of the interventions provided is evaluated by calculating the recovery rate for each intervention, with this outcome defined as the proportion of SUs achieving reliable and clinical change on the Clinical Outcomes in Routine Evaluation – Outcome Measure (CORE-OM; Evans et al., 2000). Reductions in depression and anxiety symptomatology are also examined by evaluating pre- to post-treatment changes on the Patient Health Questionnaire-9 and the General Anxiety Disorder-7 respectively.
3. **Efficiency:** The degree to which APSI provides a cost-effective service is evaluated by comparing the costs of service inputs (e.g., salary of mental health practitioners, administrative costs) with the projected financial savings for the health service and exchequer (e.g., reductions in secondary care mental health service use, increases in employment). The caseloads of individual practitioners are also routinely measured to ensure that the service is cost-efficient in each primary care team area in Roscommon.

Although APSI is in its pilot phase, one of the desired long-term impacts of this service is to enhance the integration of community mental health services, through coordination with other primary care services (e.g., Counselling in Primary Care) and secondary care mental health services. Such long-term impacts could be evaluated by examining the quality of shared care working (e.g., agreed referral protocols, shared management of SUs) and reductions in the number of inappropriate referrals to secondary care mental health services.

Step 5. Consider the service context

There may be a number of contextual factors within the service that need to be considered when planning an evaluation. These may include whether the evaluation will impact funding and resources, and whether it will raise politically sensitive issues (e.g., whether some staff are underperforming). In such contexts, staff may be reluctant to openly discuss potentially controversial topics such as caseloads or relationships with management. In order to manage such resistance, the planning of the evaluation needs to be as inclusive as possible, engaging as wide a range of stakeholders as possible (e.g., managers, staff, SUs). Doing so will help to clarify any misrepresentations regarding the purpose of the evaluation, increase transparency and assure confidentiality of participation.

Step 6. Decide who evaluates

Staff and management can successfully conduct an evaluation of their own service where they have evaluation experience and can objectively interpret evidence. The advantage of such an 'internal' evaluation is that staff will have a greater understanding of service processes and it may facilitate the subsequent implementation of evaluation recommendations (Gosling & Edwards, 2003). However, there are some contexts where an external evaluation is more appropriate. For example, where the evaluation may bring up politically sensitive issues, an external evaluator may be better positioned to objectively critique the service and produce a balanced, evidenced-based report (U.S. Department of Health & Human Services, 2010). Furthermore, the complexity of the evaluation may

require a level of specialist expertise that is not available within the service. Where an external evaluator is used, it is critical that they engage with staff during the planning stage so as to minimise anxiety around being criticised by an 'outsider' and to facilitate increased staff ownership of the evaluation process (Gosling & Edwards, 2003).

Step 7. Formulate methodology

The methodology chosen will be influenced by the level of service performance evaluated. For example, given the importance of selecting definable and measurable indicators, the methodology for both outputs and outcomes will tend to be quantitative. However, in certain cases where the outputs or outcomes require experiential analysis (e.g., 'Were SUs communicated with respectfully?'), a mixture of quantitative (e.g., satisfaction questionnaires) and qualitative data (e.g., interviews) may be used. The measures chosen also need to be appropriate for the type of service under review (Berghmans, Berg, van den Burg, & ter Meulen, 2004). For example, a measure of disorder-specific symptomatology may be appropriate for evaluating a service that primarily uses pharmacotherapy, while a measure of psychological distress and well-being, such as the CORE-OM (Evans et al., 2000), may be more appropriate for evaluating a service using predominantly psychological therapies.

A qualitative methodology will typically be required to evaluate the subtleties of a service's processes and procedures. Through various methods such as interviews, focus groups, diaries and case studies (see Table 4), the operation and evolution of a

service in its natural context can be examined. Qualitative methods can also be useful in examining SUs' perspectives on the process of service delivery. Their perspective may provide insights into the quality of communication from staff and the degree of collaborative working. In using qualitative methods however,

evaluators need to be aware of the associated limitations, such as the potential for researcher bias. In this respect, the need to analyse qualitative data in a highly systematic way is key to enhancing the validity of the findings (Gosling & Edwards, 2003).

Table 4: Examples of methodology for evaluation types

Outputs and Outcomes	Processes
<ul style="list-style-type: none"> • Surveys (hard-copy / online) of SUs, staff or the broader public to measure satisfaction with service, perceptions of service etc. • Standardised questionnaires measuring clinical outcomes 	<ul style="list-style-type: none"> • Interviews or focus groups can help understand factors that impact on satisfaction with a service (SU) that lead to attitude formation (broader public) or promote job satisfaction (staff).
<ul style="list-style-type: none"> • Analysis of data held on Information Management System (IMS) – potentially providing information on the profile of SUs, numbers of SUs entering and exiting the service, referral pathways etc. 	<ul style="list-style-type: none"> • Interviews with service staff, to aid interpretation of service processes like referral pathways. • Case studies
<ul style="list-style-type: none"> • Work logs/work activity profiles – providing information on time spent on various clinical, research and administrative tasks 	<ul style="list-style-type: none"> • Interviews with staff and management can help interpret how work is allocated to staff members, and how this impacts on service provision.
<ul style="list-style-type: none"> • Financial accounts (for evaluating cost-effectiveness) 	<ul style="list-style-type: none"> • Interviews with service managers to understand resource allocation, financial decision making, and evolution of service
<ul style="list-style-type: none"> • Other data held electronically or in hard copy – activity logs of staff, pre- and post-intervention clinical data etc. 	<ul style="list-style-type: none"> • Diary analysis or prospective diaries

Step 8. Consider ethical issues

The ethical considerations for research will also apply to service evaluations. However, not all service evaluations may require ethical approval (Brain et al., 2009). For example, ethical approval is typically not required for those evaluations that do not in any way affect routine service provision and practices, and where the results are internally disseminated for quality improvement. Also, some Research Ethics Committees (RECs) may not review service evaluations (HSE Research Ethics Committees Review Group, 2008). However, where the

evaluation may impact SUs beyond the routine delivery of care, ethical approval may be needed (see Table 5). Furthermore, ethical approval should be sought where it is the intention to publish the evaluation, both to ensure that procedures will adequately protect the data of SUs/participants and to allow the evaluation to be submitted to those journals that require ethical approval. Where there is ambiguity about whether a service evaluation requires ethical approval, advice should be sought (e.g., from a member of the local REC).

Table 5. Situations where ethical approval should be sought for a service evaluation (Quality & Patient Safety Directorate, 2013)

<ul style="list-style-type: none"> • Poses a risk or burden for the SU beyond that of routine care • Involves any significant departure from usual care • Gathers information from SUs other than that which is routinely collected 	<ul style="list-style-type: none"> • Involves an external evaluation team collecting data directly from SUs • Involves an individual accessing identifiable SU records that they would not routinely access • Involves evaluating a newly-introduced intervention or new system of service provision
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Regardless of the need for ethical approval, evaluators need to avoid complacency in identifying the potential ethical risks. For example, the evaluation team needs to be aware of their responsibilities should they encounter an instance of malpractice, or a SU in need of immediate treatment. With regard to the issues of consent, best practice is to advise all SUs at their point of entry that their anonymous data may be used for evaluation purposes. When the evaluation involves non-routine contact with SUs or staff (e.g., interviews), the standard procedures

for gaining expressed informed consent will apply. With regard to data protection, SU data can be assigned anonymous codes, or where identifiable coding is used, these codes may be only traced back to the SU with their consent. In cases where an external agent is conducting the evaluation, staff working within the service should code the data before allowing access. Where an evaluation team has concerns about issues of consent or confidentiality, advice should be sought from the Office of the Data Protection Commissioner (www.dataprotection.ie).

Step 9. Develop report

A draft report needs to be initially disseminated to key stakeholders to establish the report's factual accuracy and identify other potential limitations. As evaluations are primarily designed for the decision-making community (rather than the scientific community), the need for clarity of communication is paramount. It is good practice to include an executive summary to profile the important findings and recommendations. In instances where the report is directed at a key decision maker, a short report with multiple tables and graphics of key performance indicators may be appropriate. A more descriptive report with a detailed interpretation of the results may be more suitable for a wider audience.

The recommendations of a report need to highlight the specific objectives for improvement (both short- and long-term goals), as well as aspects of the service in need of further evaluation. The recommendations need to be aligned with the strategic aims of the service and be strongly grounded in the evidence of the evaluation. Speculative recommendations must be avoided, particularly for politically sensitive topics such as funding or resource requirements (Robson, 1993). Furthermore, recommendations of major changes to a service (e.g., staff redeployment) should only be made where the data conclusively suggests substantial benefits.

Step 10. Disseminate report

The medium chosen to communicate evaluation findings needs to reflect the target audience. For example, if an evaluation is aimed at management-level staff, it may be useful to submit

findings to a management journal provided it can be published within an appropriate timeframe. If the goal is to communicate findings to a broader audience within a short timeframe, open-access databases such as *Lenus* (www.lenus.ie/hse; Lawton & Byrne, 2015) may be appropriate. In addition, it may be beneficial to communicate the evaluation results on staff websites such as *HSEland* (www.hseland.ie; McHugh, Byrne, & Liston, 2015) or staff newspapers like *Healthmatters*.

Step 11. Implement recommendations

Once an evaluation report and its recommendations have been accepted, a service needs to convene an implementation group comprised of key stakeholders that has the power to oversee the implementation of these recommendations. Their work will invariably include addressing potential barriers to change. Here the degree to which staff members were involved in the evaluation process will be an important facilitator of change. A follow-up service evaluation may need to be conducted to assess the effectiveness of any implemented changes. This will ideally involve methodological improvements as identified by the original service evaluation. This follow-up evaluation is not just necessary for re-examining service performance, but also in supporting and motivating the efforts of staff involved in enhancing service quality.

Conclusions

The objective of this paper was to present an overview of clinical service evaluation from an applied perspective (see Table 6 for a summary of each step). What is evident from the process is that there is no rigid model

of evaluation. Rather each evaluation will involve a series of key decisions that are made based on the underlying motivation for the evaluation and the service context. Furthermore, engagement with staff throughout the evaluation process will play an important role in facilitating changes recommended by the evaluation report.

As the nature of our health service evolves, the monitoring process needs to adapt to our changing services (Clarkson & Challis, 2002). For example, within mental health services there has been an ongoing shift from institutional to community care. Clearly, evaluating community care based on the traditional priorities of institutional care will provide somewhat of a distorted picture. Furthermore, as the need for care co-ordination and integrated service provision increases, processes related to multidisciplinary teamworking and shared care need to assume greater priority.

Table 6: Steps to conducting a service evaluation

Step	Description
1. Determine dimension(s) of evaluation	<ul style="list-style-type: none"> Effectiveness, acceptability, accessibility etc.
2. Determine the type of evaluation	<ul style="list-style-type: none"> Goals, outcomes, process or a combination of these
3. Decide if prospective or retrospective	<ul style="list-style-type: none"> Collect data as service functions, or as it functioned
4. Decide scope	<ul style="list-style-type: none"> What data collection do resources permit? Will collected data answer the evaluation question? What information does target audience require?
5. Consider the service context	<ul style="list-style-type: none"> Competition for funding, defensive evaluation etc.
6. Decide who evaluates	<ul style="list-style-type: none"> External or internal evaluator
7. Formulate methodology	<ul style="list-style-type: none"> Adapt methodology to type of evaluation
8. Consider ethics	<ul style="list-style-type: none"> Ensure appropriate procedures for gaining consent, confidentiality, data management etc.
9. Construct report	<ul style="list-style-type: none"> Recommendations need to be grounded in the evidence
10. Disseminate findings	<ul style="list-style-type: none"> Medium needs to reach target audience
11. Implement recommendations	<ul style="list-style-type: none"> Ensure follow-up evaluation to assess the effect of changes

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HOW TO WRITE AN ABSTRACT

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What is an abstract?

The dissemination of research is a necessary process for ensuring that research has impact and contributes to scientific advancement. Dissemination is typically done via an oral presentation at a conference or through a research manuscript published in a scientific journal. The *abstract* is a summary paragraph that describes the key information from your research and accompanies the submission of your work to a conference for an oral presentation or to a journal for publication of an article (Beins, 2004; Cozby, 2004).

The structure of the abstract typically follows the structure of the research article (Harris, 2008). In a research article, there are four main sections:

1. Introduction/background – What is the context and objectives of the present research?
2. Methodology – How did you conduct your research?
3. Results – What did you find?
4. Discussion – What are the implications of your results?

The abstract, whether it is for a conference presentation or for an article to be published in a scientific journal, should provide a brief but clear description of each of these areas.

What is the purpose of an abstract?

The abstract has three main purposes. First, as mentioned previously, the abstract is a summary of your research. As such, the abstract should provide readers with an overview of the research conducted. Second, when a keyword search is conducted using a library collection or electronic database, the result will present titles and abstracts. These parts of the paper will be read in order to ascertain if your research is relevant (Dunn, 2013). Finally, on a practical level, when submitting your research article for publication or for presentation at a conference, the abstract is the first piece of text the journal editor and reviewers will see. Thus, the abstract provides the reviewers with the first impression of your research and needs to be written in a way that convinces them that your research is relevant for their journal or conference.

Where is it positioned and how long should it be?

Before you write the abstract make sure you have checked the submission guidelines for the specific journal or conference to which you are submitting. The word count of the abstract depends on the parameters set by each journal or conference. The length of an abstract usually ranges between 150 and 250 words. Journal and conference guidelines are strict so you need to be selective about what information you choose to include while making sure that you accurately represent the content of your research within the short word count. When deciding what information to include/exclude, consider again the important role of the abstract in presenting a positive first impression of your research.

Writing the abstract

Although the abstract is the first section to appear in the research article, it should be the last written and its contents should follow a similar sequential order as the presentation of content in your research article (Beins, 2004; Dunn, 2013; Harris, 2008). In certain journals (e.g., Bio Med Central: Public Health), a template of the abstract structure is provided (i.e. Background; Method; Results; Conclusion) and it is the researcher's responsibility to fill in each section accordingly. In the following paragraphs, we outline the contents of each section of the abstract. To demonstrate these recommendations, we have included an example abstract of a fictitious experiment examining the effects of sleep deprivation on medication adherence:

There is much evidence to suggest that sleep deprivation negatively impacts medication adherence in children. Sleep deprivation is defined as prolonged periods without sleep and medication adherence is defined as the extent to which patients take medications as prescribed by their health care providers. The aim of the current research was to examine the effects of sleep deprivation on medication adherence in an adult sample. A between groups design was employed (sleep deprived versus non sleep deprived). A simple random sample of 40 Irish university students (20 males and 20 females, $m = 22.3$ yrs, $SD = 1.4$ yrs) took part and were randomly assigned to the sleep deprived and non-sleep deprived groups. Those in the sleep deprived group received two automated wake up calls at 0200 and 0430 on the night of the study while those in the comparison group did not receive wake up calls. Participants in both

groups reported their number of hours sleep. A medication adherence report scale was used to assess adherence. The number of people who adhered to their medication was lower in the sleep deprived group ($m = 24\%$) versus the non-sleep deprived group ($m = 82\%$). Results from an independent t -test, $t(38) = 2.70$, $p = .01$, indicated that sleep deprivation had a statistically significant effect on medication adherence. The present data supports the contention that sleep deprivation negatively impacts upon medication adherence. Recommendations for best practice are discussed, including the development of adherence interventions for the sleep deprived.

Sentence excerpts from this abstract, along with each of their corresponding sections, are included below to give you a further idea of what to write and where to write it. These sentences are denoted via an asterisk (*) and are presented in italics.

Sections in the abstract

Background

The opening sentences in an abstract provide the context for your research (Dunn, 2013; Harris, 2008). When you are writing this section, bear in mind that the content follows a similar structure to the introduction in the research article, moving from the more general to the specific. Begin with a one or two sentence summary, introducing the topic of interest. Specifically, outline the research area to be studied, provide some background theoretical information and state (operationally define) the experimental variables of interest. We have included the terms 'operationally define' in brackets here because it is not always possible due to word counts to define the variables of

interest in this manner. By operationally defining your variables, we mean providing the definition of your variables as they were measured in your study (Cozby, 2004; Shaughnessy, Zechmeister, & Zechmeister, 2014). For example, if you were looking at the impact of sleep deprivation on medication adherence, you would have to define, in the context of your study, what you meant by sleep deprivation and medical adherence. Next, state the primary research question(s) and hypotheses in one sentence. The research question should include the variables that you previously described in the opening sentences.

** There is much evidence to suggest that sleep deprivation negatively impacts medication adherence in children. Sleep deprivation is defined as prolonged periods without sleep and medication adherence is defined as the extent to which patients take medications as prescribed by their health care providers. The aim of the current research was to examine the effects of sleep deprivation on medication adherence in an adult sample.*

Method

The method will describe in detail how you conducted the study (Dunn, 2013; Harris, 2008). Once again, there is a standard and structured progression to this, which follows the prescribed set of guidelines used in the method section of the research article. First, you need to describe the design of the research study (Dunn, 2013). For example, was your research descriptive (e.g., case study), correlational (e.g., cross-sectional or longitudinal), quasi-experimental or experimental (i.e., randomised control trial); was it a review of other research

(e.g., basic literature review, systematic review or meta-analysis) or was it a qualitative piece of research (i.e., focus groups, interviews or participatory methods). If your research was experimental, you will need to describe each experimental condition; whether the sample was related or unrelated; and/or a mixed design. For example, if examining the effect of sleep deprivation on medication adherence, we could have at least two conditions: one participant group that gets normal levels of sleep and another participant group that gets low levels of sleep. As we have two conditions (sleep deprived sleep versus non-sleep deprived), we can say we have a between groups (unrelated) design.

**A between groups design was employed (sleep deprived versus non sleep deprived).*

Next, describe the sample of participants in your study. By sample, we mean the people who participated in your research. In particular, outline the selection process for your participants (i.e. how they were recruited and the sampling method such as simple random, convenience, stratified, cluster etc.) and any details of their key demographic features (Harris, 2008). Typically, you would provide a breakdown of gender, mean age, age range, and any other information pertinent to your research question. For example, it would be important to note the proportion of individuals suffering from insomnia if examining the effects of sleep deprivation.

In an experimental design, describe how your participants were assigned to the *conditions* of your research (Dunn, 2013). By conditions, we

mean the participant groups associated with different levels of the independent variable (e.g., control group, treatment groups). For example, if you had an intervention with two conditions (e.g., control v treatment group), then we need to know how you decided to allocate participants into each group (i.e. random or non-random assignment). In the case of our example study, we could say that participants were randomly assigned to the sleep deprived group or non sleep deprived group. It is very important to detail accurately the key features of the sample, both to allow readers to judge the influence of third variables associated with participant characteristics (e.g., higher socioeconomic status of college students) and to allow readers to judge the generalisability of your research.

**A simple random sample of 40 Irish university students (20 males and 20 females, $M = 22.3$ years, $SD = 1.4$ yrs) took part and were randomly assigned to the sleep deprived and non-sleep deprived groups.*

Next, briefly describe the apparatuses and/or materials used and the procedure that was followed in your research. Apparatuses and materials may refer to items such as questionnaires, scales, intelligence tests or electronic equipment (e.g., fMRI) that were used during the research process. The procedure may describe how participants progressed through the research phases and will typically detail what measures were administered at the different research timepoints.

** Those in the sleep deprived group received two automated wake up calls*

at 0200 and 0430 on the night of the study while those in the comparison group did not receive wake up calls. Participants in both groups reported their number of hours sleep. A medication adherence report scale was used to assess adherence.

Results

The results component of the abstract can vary widely depending on the nature of the research question, the type of research design employed and the statistical techniques used to analyse the collected data. The key steps to this procedure are to (a) report statistical outcomes in a way consistent with the associated referencing system and (b) *only* report the key findings that directly relate to your main research question. For example, if we found that the variables of weight and gender had an effect on medication adherence in our example study, we would not report this effect in the abstract as it does not inform us of whether the main hypothesis was confirmed or rejected (i.e. does sleep affect medication adherence). These secondary results can be described and elaborated upon in the discussion of your research article or when presenting the results at a conference. Though what you report in the results section of the abstract largely depends on the nature of your analyses, you will typically report: (1) the descriptive statistics of the key variables relevant to your research question; and (2) the analytical method used and the associated statistics or findings (Dunn, 2013; Harris, 2008).

**The number of people who adhered to their medication was lower in the sleep deprived group ($m = 24\%$) versus the non-sleep deprived group ($m = 82\%$). Results from an*

independent t-test ($t[38] = 2.70, p = .01$) indicated that sleep deprivation had a statistically significant effect on medication adherence.

Conclusion

In the final section of the abstract, the aim of the conclusion is to summarise the overall implications of your research and its findings (Dunn, 2013; Harris, 2008). First, interpret or contextualise your main finding. The manner in which this is completed depends on the goal of your research (i.e., to examine a theory, change best practice, inform social policy). For example, if the goal of the research was to explore a particular theory, then you can relate your work to the existing literature (i.e., *do your findings support or contradict previous research and theories*). However, if your research focused more on practical applications, you may state whether your findings support or challenge current practices or policies. The last sentence of your abstract focuses on the implications of the research findings and may examine directions for future research (Cozby, 2004; Dunn, 2013; Harris, 2008). With respect to the implications of the research, you may describe how an established theory needs refinement, or how existing practices are not evidenced-based and require change. These implications are not isolated to

the abstract, but will have been discussed in your research article or conference presentation. With regards to addressing future research, you may describe an area for future investigation based on the implications of your research findings. In our example study, areas of future research may include a replication study with a bigger sample, or research evaluating the success of adherence interventions for those sleep deprived.

**The present data supports the contention that sleep deprivation negatively impacts upon medication adherence. Recommendations for best practice are discussed, including the development of adherence interventions for the sleep deprived.*

Concluding points

First and foremost, if you are submitting an article to a particular journal or research conference, ensure that you are familiar with the author guidelines as each will have their own criteria for the abstract. For example, the abstract sections of journals may differ (e.g., conclusions versus practical implications) as well as the referencing system used (APA versus Harvard). Below is a brief checklist to help you through the writing process of an abstract:

Table 1. Abstract checklist.

Checklist	Length	Key feature 1	Key feature 2	Key feature 3
Background	1-3 sentences	Previous research	Define variables	State research question
Method	1-3 sentences	State design	Describe participants	State measures and data collection procedure
Results	1-3 sentences	Report key descriptive findings	State method of analysis and what was found	Do not interpret findings here
Discussion	1-2 sentences	Contextualise findings	Implications	Future research

In summary, the abstract is a synopsis of your research and acts as a 'front page' to capture your target audience. The content of the abstract should be sufficiently detailed, allowing readers to make an informed decision on whether your research is relevant. Finally, your abstract should be engaging, encouraging readers to examine your findings and consider their implications.

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WRITING FOR PUBLICATION: A PRACTICAL GUIDE FOR THE HEALTH AND SOCIAL CARE PROFESSIONS

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MARY COFFEY

Introduction

HSCPs have extensive clinical knowledge which has a sound academic basis usually underpinned with basic research skills that is valuable to the advancement of their professions and should be widely disseminated. Writing for publication can seem a somewhat daunting prospect for health and social care professionals (HSCPs) and is often only seen as possible for those HSCPs working in higher educational institutes (HEIs). This is an unfortunate perception as case reports and original research articles from current clinical practice can often be the most interesting and tangible for the clinical reader.

HSCPs strive to achieve the best possible outcomes for their patients or clients by adhering to evidence-based practice. As part of this process, it is incumbent upon our HSCPs to add to the body of knowledge underpinning their specialist areas. Examples include the development of novel treatment techniques in radiation therapy, physiotherapy, speech and language therapy and occupational therapy; the development of advanced imaging practice in radiography; and the increasing emphasis on patient involvement and how this can be

supported. Therefore, perhaps the question that should be posed at the introduction to this paper is not 'why publish?', but rather 'why *not* publish?'

What format should potential publications take?

There is a myriad of publication types that HSCPs can consider. The empirical research article is one such format, but as there are currently a limited number of full-time researchers in the HSCPs in Ireland, alternative formats that can be considered include systematic reviews of the literature; articles based on educational theses; empirical publications; case reports or reviews; and reports on the implementation and facilitation of clinical trials or new clinical techniques from the health service professional perspective. Regardless of publication type, the two most pertinent questions that should be considered at the outset of the writing process are:

1. **What** message do I want my publication to convey?
2. To **whom** do I want to convey this message?

Identification of both the key message of your publication and the target audience are critical steps in the publication process. Hall (2011) summarises this succinctly by stating that you should have something to say before considering publishing. The message should be clear, concise and represent a significant addition to the body of knowledge on the topic in question.

Which journal should be targeted for publication?

Selection of the journal to which your paper will be submitted is an important choice and requires due consideration. It is to be commended when HSCPs aim to publish in a high impact factor journal; however such ambition should be tempered with realism surrounding the quality and nature of the work. The impact factor refers to the average number of times papers in a journal have been cited in other peer-reviewed publications in the previous two years (Kuo, 2003). If the target audience is fellow HSCPs employed in clinical practice, it would be prudent to select a journal most likely to capture this audience, even if more academically-based journals have a higher impact factor. Whether the journal's readership contain your target audience will be far more important than the size of the journal's readership.

Adhere to your target journal's submission guidelines

Strict adherence to the journal's author submission guidelines is strongly advised. Each journal will clearly state the type of papers it accepts for publication as well as the format the paper should take (although most follow the IMRAD format – Introduction, Methodology, Results and Discussion). Word count, line spacing, page numbering, font size and style margin settings as well as specific criteria for the presentation of tables and figures must all be adhered to. Your paper also needs to adhere to the referencing system used by the journal. Most medical journals use the Vancouver system while those in the social care professions tend to use the Harvard style. While not a necessity, it is advised to use a referencing tool

such as Endnote, Zotero or Refwork to make the referencing process easier. Available online, these are industry standard software tools for publishing and managing bibliographies, citations and references on the Windows and Macintosh desktop, and they will manage your references in a logical format from the beginning of your writing process. Along with the referencing system used, formatting of your paper may be best left until your paper is just about ready to submit.

Getting started

Once you establish that the message you want to convey is suitable for publication and you know your target audience, you can begin your writing process. If this is the first time you have considered writing for publication, you may consider finding a suitable mentor to assist you. This mentor may be a colleague who has previously published or a past supervisor in a HEI who publishes regularly. Having the experience of a mentor to guide you can be beneficial in avoiding some of the potential pitfalls of the publication process. If you have worked with multidisciplinary team colleagues on a piece of research, they may be in a position to provide help and support you in the writing process.

Authorship

Remember that if more than one author is contributing to your paper, the subject of authorship should be considered at the outset. To be named as an author on your publication, an individual should have made a significant contribution to the writing of your paper or to the research being reported in the paper. In the interests of fairness, regardless of one's qualification or relative

standing in one's profession, the author who has contributed most to the study (e.g., design, data collection and analysis, write-up) should be cited first. However, some supervisory authors will insist on their being noted as first author, and for some disciplines, it is usual to cite the principal investigator last. Other individuals who may have contributed to a lesser degree should be cited as second, third, fourth authors etc. It is common to acknowledge individuals who may have helped with more minor areas of the work (e.g., facilitated data collection) and not cite them as full authors. The corresponding author is usually the first or last author and should provide their name, address, phone and fax numbers and email address. Remember that all authors should sign the covering letter accompanying the paper to avoid delays in the review process; again this will all be detailed in the submission guidelines.

How do I make time to write?

Writing for publication can be difficult, as is finding the time to write. There is also a common misconception that you need to wait for a particular mood, idea or inspiration before you can start to write. This is not the case. Writing is an active process that you must fully engage in. You must be highly organised in your time management if you are to be successful in getting your paper started and finished.

You should not underestimate the level of commitment and effort that is required to take a body of research or topic to publication. Unless you are prepared to accept this commitment, it will be difficult to complete the process successfully and in a timely fashion. The writing process is unique for every

writer but there are useful tips that can assist you in getting the process started.

Plan, revise and plan

There is a certain level of organisation and discipline required in designating a time period dedicated to writing. To get your writing started and to build your confidence as a writer it can be useful to write in short 'bursts' of 15-20 minutes where the focus is on generating text only. You should create a timeslot in your diary each day or week that you assign yourself the task of writing, for example 20 minutes each morning before work. By limiting the time of your writing session, it can help sharpen the focus of your writing. When creating your plan, take each section and subdivide it into sub-sections; allocate each one a time slot of its own; and do what you can in each time slot. You need to set specific and achievable goals for each session (e.g., 300 words in 20 minutes). In this way you know exactly the focus and outcome of each session. Allocate the last time slot of the period to read through, assess and revise the content and plan your goals for the next period. As you progress with your writing you will learn what timeslot, goals and plan works best for you. Perseverance will be necessary at all stages of the process as your plan may often break down.

The writing process

Although most under- and post-graduate degree programmes incorporate a range of modules on research methodology and statistics in their curricula, the skill of scientific writing is often overlooked. It can be incorrectly assumed that writing skills do not have to be taught or practiced.

However, with practice, these skills can be learned and developed.

One method of improving your scientific writing skills is to read papers in highly ranked journals and examine the writing style adopted by successful contributors (Hall, 2011). Scientific writing should make use of careful word choices, which aid clarity, simplicity and accuracy (Fahy, 2008). Do not feel that you have to use different words to describe the same action. Keep it simple and clear.

Your paper has a message that you want to convey to the readers of the journal. How you write the paper can have a significant influence on whether or not you succeed in achieving this. To achieve clarity in a paper, use the simplest and most accurate terms to describe the ideas of the paper. This may be in contrast to creative writing styles where superfluous language may be used for dramatic effect. Like any form of writing however, the use of correct grammar and punctuation cannot be overstated.

Section headings identify discrete areas within your paper and are helpful to the reader. The paragraphs within a section should be related to the section heading. Along with possibly providing a concluding statement on the content of a paragraph, the last sentence of each paragraph should provide a link to the following paragraph.

Paragraphs can be considered as 'a unit of thought' (Fowler, 1926) and should be clearly defined with one topic per paragraph. Moving from one topic or idea to another in any one paragraph makes the paper difficult to follow and conveys a lack of

coherence. It is also useful to introduce the topic of the paragraph in the first sentence, immediately capturing and focusing the attention of the reader. Individual paragraphs should not be excessively long and end with a concluding statement on the content of a paragraph. Reading a paragraph aloud may give you a sense of where it should end.

Sentence length is also important – too long (e.g., trying to include too many points) and you may lose the attention of the reader; too short and it can be difficult to read. Punctuation also impacts on the readability of your paper. Poor grammar and/or punctuation will impact negatively on the reading of your article and the editor of the chosen journal may view this as carelessness, which will also call into question the care to which the work underpinning the paper was carried out. Use punctuation to indicate a natural pause or stop in the flow of a sentence, making it easier to read and understand. It is often valuable to read your paper aloud to identify where the natural pauses occur and to evaluate the sense of your message and whether you are conveying it effectively. It is also useful to ask someone else to read it for you from this perspective.

Be careful with the use of capitals. Capital letters are used at the beginning of sentences and to denote proper names. Job titles are not capitalised unless they are directly related to a person as part of their title. If in doubt, a good rule is to not use capitals. If you are quoting from a book or another paper you may not want to use the full text. In these instances you can use an ellipsis, which is three full stops (...) and

indicates that something has been left out of the quote.

When you are using acronyms or abbreviations they must be defined the first time they are used in the paper. Acronyms are a compilation of the initial letters of a string of words, often the title of a group or company and can be particularly useful if the original name is long. However they should be used carefully and sparingly. It can be distracting to read lists of acronyms or abbreviations in a paper that are not immediately understandable. For non-journal papers, a section at the front of your paper should give the acronyms used.

Bullet points can be useful as they are easy to read, attract attention and remove excess text. When using bullet points, you must have an introductory sentence or statement and all bullet points should flow from this statement. As numbers may be used to indicate rank or sequences of action, ensure numbered bullet points are used appropriately. Bullets points should be consistent in length and structure. If your bullets are phrases or brief statements, there should be no punctuation, but if they are sentences, use full stops. Ideally bullets should not be full sentences as they are designed to be short summary points. Always end the bullet list with a concluding sentence.

Structure of the paper

Each section of your paper should include only material pertaining to that particular section. Dixon et al. (2001) suggest writing a complete outline of the paper from why you set out to do the work described in the paper through to asking what the benefits of the paper are for key stakeholders.

They then suggest basing the paper around these completed sentences within their discrete sections.

Introduction

The introduction should not just 'set the scene' of the paper but should bring the reader's attention to the message of the paper almost immediately. A good introduction does not include unnecessary or irrelevant background information. For example, if discussing a novel radiotherapy treatment technique in head and neck cancer, it is important to introduce the technique early on in the introduction instead of providing basic information on head and neck cancers, with which the reader will already be familiar.

Methodology

It is essential that your paper (if an original research article) contains an indication that your research was granted approval by the relevant research ethics committee prior to conducting the research process. Indeed, many journals require same. More generally, clarity in the methodology section is critical. The methods used should be described in simple terms to ensure complete transparency. The reader of the paper must understand the methodology used to put the results into meaningful context. The methodology must be consistent with the type of study, the data to be collected and the method of analysis. In essence, the methodology should be detailed in such a manner that if the reader were to conduct the study him or herself, they would be equipped with the information to do so from this section.

Results

The results section should contain only the results of the paper and should not

refer to the implications of the results (reserved for discussion). The results will typically be presented using both text and tables or graphs as appropriate. Charts and tables are useful means of presenting data. They should be clear and easy to understand. The main findings should be described in the text but it is important not to duplicate everything presented in the table or chart. You should take care with colour differentiation in charts, as the majority of journals will reprint in black and white. Charts that look very clear in colour may be completely lost in black and white and become meaningless to the reader. Use different shades between white and black and clearly identify the elements of your charts or graphs.

Discussion

Here, the implications of the results are evaluated and put into context by discussing them in terms of the existing literature. Presenting or repeating results in the discussion section is to be avoided and can be a common mistake of many novice authors. It is also worthwhile to acknowledge any limitations of your paper in this section.

Abstract

While the abstract is the first section of your paper to be presented, it should not be written until all other sections have been completed. Ensure that the abstract is simple and to the point, brevity is key. The purpose of an abstract is to present the main work of the paper and to encourage the editor/reader to read the manuscript itself. Journals will usually provide criteria on the structure of the abstract, most often in the form of

background, methodology, results and conclusions.

Title

Selecting an appropriate title for your paper is essential. The title must be indicative of what is to follow. Use of bold or unusual titles is permissible but remember that the title must be based on the research question/topic. This is also important as readers searching for papers in this field may use certain key words in their search and you may want your paper to be included in the search results.

Proof reading

Check spelling carefully when proof reading and do not overly rely on electronic spell check. Spell checkers literally check the spelling and grammar but may miss errors like typos which results in new words (e.g., 'form' instead of 'from'). The computer spell check may be programmed for United Kingdom English or American English and it might be useful to check which the journal uses. It can be useful to ask someone else to read your paper as they may be more sensitive to identifying mistakes you have initially missed.

Justification should ideally be left sided for the publishers and this also makes it easier for anyone to read. Left-sided justification is recommended to address issues such as dyslexia.

Reading and re-reading your paper is useful and has several purposes. Reading the paper straight through from beginning to end helps you to clarify whether you have achieved your aim and whether your message is clear to the reader. However, when you are reading to check for errors, you need

to read line-by-line. When you read your paper you should consider unnecessary words, sentences or paragraphs, do remember that many journals have a maximum page limit. Do they add anything to the paper? If they were removed, would anything be lost? If the answer is no, then delete them, as this will make your paper more focused, easier to read and more likely to be published.

Some additional tips on formatting include:

- Do not adjust margins to try and keep the manuscript shorter (if given guidelines on the number of pages permissible). This only serves to condense the material and make it difficult to read and edit.
- Use double spacing (typically); number your pages, figures and tables; and ensure all are correctly labelled.
- Check that your citations and references match.
- Recheck that your use of the referencing system required is correct.
- Follow the journal's submission guidelines in relation to formatting.

Be prepared for numerous drafts and re-drafts of your paper; it is highly unlikely that the first draft will be that which is submitted for peer review. It is not uncommon to go through five or more drafts before deciding that you have reached a version that is of adequate standard for submission. Before submitting, ensure that the manuscript is formatted correctly.

Suggesting Reviewers

Some journals will ask you to suggest reviewers for your paper at the time of

submission. It is preferable not to suggest a reviewer with whom you have worked previously or know on a personal level. It is best practice to suggest reviewers who are perceived experts regarding the topic of your paper; who may have recently published on the topic of your paper; or who have recently published in the journal you are submitting to.

Publication Ethics

'Dual publication' (i.e. publishing the same data in more than one paper) is considered unethical and should be avoided as a matter of principle. It is detrimental to your own curriculum vitae, your professional reputation and the reputation of your discipline to engage in same. If found to have dually published, you may be censured from publishing in the future.

What happens after I submit my paper?

Returned to you by your target journal's editor, there are many different types of responses you can expect from the reviewers including:

1. A rare occurrence, your submitted paper may be accepted without any requested amendments.
2. More commonly, your paper may be accepted subject to your responding to, and integrating into your resubmitted paper, recommended amendments from the peer reviewers, and/or your responding satisfactorily to their queries or comments. Whether the former are minor (e.g., specific queries around the theoretical basis of your introduction; more detail related to your data analysis or methodology) or major (e.g.,

further data analysis; a re-write of significant sections of your paper) will influence whether you decide to undertake the additional requested work and resubmit. While this process will be invaluable in terms of increasing the quality of your paper, you can choose not to integrate specific recommendations and instead provide a rationale for your decision not to do so. To minimise the work of reviewers in considering your resubmission, along with the tracked changes that you have incorporated into your resubmitted paper, it is beneficial to post (in bullet point fashion) all the reviewers' feedback into a single Word file and then provide a response to each feedback point.

3. Rejection of your paper on the basis of feedback from reviewers. While disappointing, you can use this feedback to improve the quality of your paper, and then try to resubmit to another journal (adapting the paper to that journal's submission guidelines).
4. Rejection of your paper on the basis of editor review (who does not even proceed to asking the recommended external reviewers to review your paper). Such a response may be due to your paper not matching the content area of the target journal or your paper being significantly below the accepted norm for same. If so, consider lower impact journals to submit to.

Conclusion

HSCPs have a wealth of extensive clinical knowledge that can substantially add to the body of knowledge of their respective professions. This paper has highlighted some of the practical aspects that should be considered prior to embarking on the dissemination of this information through publication.

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APPENDIX A: EMBRACING LENUS - THE IRISH HEALTH REPOSITORY

AOIFE LAWTON

MICHAEL BYRNE¹³

Abstract

Of relevance to healthcare professionals engaged in research and those who want to deliver evidence-based clinical care, this article describes the Irish health repository called 'Lenus' (www.lenus.ie). While managed by the Health Service Executive (HSE), it is freely accessible on the World Wide Web. The benefits and functionality of the system are outlined and an appeal for content submission is made to all Irish health professionals, and in particular to psychologists and other Health and Social Care Professionals (HSCPs), who are engaged in research and/or publishing their findings.

Introduction

At best, there is a weak health research culture in Ireland with the 0.06% spend on health research being only approximately half that of the OECD average (Health Research Board [HRB], 2009). Among practitioner psychologists it is also debatable whether the much vaunted scientist practitioner model has ever been enacted at the level of the profession. This model describes how professionals draw on and contribute

to the research knowledge-base in their routine clinical work (Milne et al., 2008). In harvesting a myriad of health-related resources that are accessible via the user-friendly interface that is Lenus, it has the potential to provide a platform to embed such a scientist-practitioner culture.

Initiated and managed by Dr. Steevens' Library and Information Centre, HSE, Dr. Steevens' Hospital, Lenus is the national Irish Health Repository. It takes its name from the Celtic God 'Lenus' of health and well-being. This duality sums up what Lenus is about – it is Irish and it hosts information on healthcare. It is unique in the scope of its coverage. Materials include current official Irish health publications, policy evaluations and clinical research. It also contains an archive of previously unavailable digitised content including department of health reports and former health board minutes. In drawing on historical documents and the latest health-related publications, it is an invaluable resource for researchers and those who want to deliver evidence-based clinical care. Lenus also has a preservation function. It makes available and preserves the corporate memory of the HSE and former health boards before it. The intellectual output of the organisation is made available in the form of published output for future generations to learn from and improve upon.

Website structure and scope

The Lenus Home page provides a number of functions. All publications are made available and do not require a login. There is a registration process

¹³ This paper is largely based on 'Lawton, A, & Byrne, M. (2012). Embracing Lenus – The Irish Health Repository. *The Irish Psychologist*, 38(6), 163-165' and has been reproduced with the permission of the Editor of the Irish Psychologist.

which consists of entering a valid email address and thereafter accessing additional functions of the site using a password. Additional functions include setting up a researcher’s page and submitting research. Requests to authorise submission of healthcare-related materials are sent to the Lenus Administrator (regionallibrary@hse.ie) who then posts materials. Alternatively health professionals may directly submit their published research through the Lenus homepage by using the button marked ‘submit’. Uncompleted research may be submitted using the ‘ongoing research’ button as shown in Figure 1 below. There are the standard ‘Search’ and ‘Advanced Search’ functions. The ‘Browse by’ function facilitates field-specific searching e.g., by ‘Communities & collections’, ‘Title’, ‘Author’, ‘Date published’, ‘Date submitted’, ‘Subject’, and ‘Researchers’. Inputting a surname followed by a forename under the ‘Author’ field accesses whatever materials an individual has submitted. The resultant list provides the issue date (or year of publication), the title of the material, and names of the author(s). As well as opening up either abstract (i.e. some publishers only allow abstracts to be posted) or full text material, details of how many times the material has been viewed and downloaded is available, complete with a colour-coded world map indicating the geographical locations (by city and country) of those viewing and downloading the deposited material.

Registered users can also set up a ‘Researchers’ page. In addition to providing personal contact details, this page profiles research interests, links to published research and details of ongoing research. A benefit to the

researcher is that his/her research activity becomes more visible. In so doing, these pages can facilitate inter-researcher communication.



Figure 1. Lenus Homepage demonstrating ‘Submit’, ‘Ongoing Research’ buttons and ‘Researchers’ page.

The ‘Communities’ function allows searching and browsing by ‘Health and Social Care Professionals’, ‘HSE’, ‘Hospital research’, ‘Other Irish Health publications’, ‘Research articles’, and ‘Special collections’.



Lenus, the Irish health repository

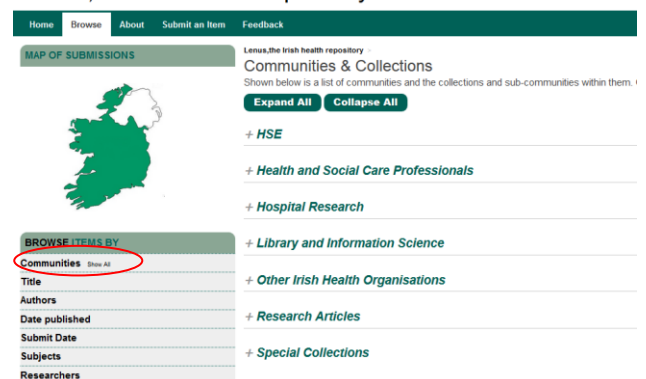


Figure 2: Communities and Collections available in Lenus

Registered users can subscribe to individual collections to keep up to date with what is being published.

- **HSE**
 - Children & Young People 105
 - Corporate 231
 - Crisis Pregnancy Programme 71
 - HSE Board & Directorate Minutes 11
 - Health Promotion 75
 - Health Protection Surveillance Centre (HPSC) 271
 - Health and Well Being 13
 - Hospitals (Acute Services) 123
 - Mental Health 72

Figure 3: Individual Collections in Lenus (e.g. Mental Health).

For example, a psychologist could subscribe to the 'HSE Mental Health' collection as well as the 'HSE theses', 'Psychologists' and 'Research articles' collection. This means that each time a publication is added to any of these collections within Lenus, the psychologist would receive an email with an updated list and links to those publications either in fulltext or abstract format. Additionally, there is a 'Latest submissions' function that lists the most recently submitted materials to Lenus.

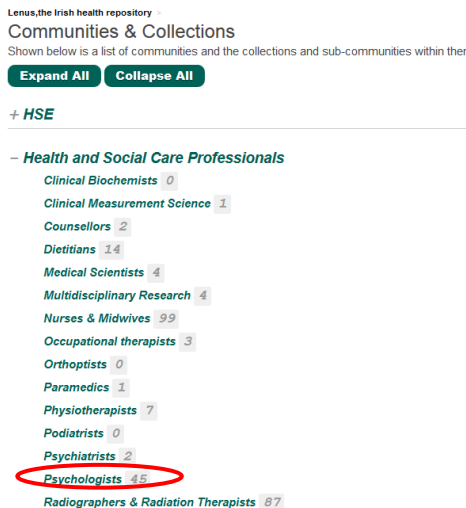


Figure 4: Psychologists collection in Lenus

Under the HSCP community there is a listing for 'Psychologists' as well as other HSCPs. The 'Psychologists' collection comprises of published abstracts and fulltext papers authored

by psychologists working outside of a hospital setting in Ireland. Any research undertaken by health professionals affiliated to a hospital is found under the individual hospital collection.

Accessibility

The current information climate is a challenging one due partially to the speed of technical developments in the information sphere (e.g. the Internet). For any database to be visible and accessible, it needs to tick some boxes such as integration with other portals, interoperability and indexing. Lenus ticks all of these. It is fully integrated with two other research portals: namely RIAN¹⁴ and the World Wide Science Alliance¹⁵ run by the Office of Scientific and Technical Information (OSTI), an element of the Office of Science within the U.S. Department of Energy. Better still, it is OAI (Open Archives Initiative) compliant. This is an initiative to develop and promote interoperability standards to facilitate the efficient dissemination of content and means that it is fully indexed and retrievable via big search engines such as Google and Google Scholar. Hence, psychology-related research deposited on Lenus provides impressive exposure to the significantly large customer base of the big search engines.

Democratisation of information

The advent of the second version of the web, known as 'Web 2.0' has brought significant changes to the way the Internet works and more significantly the way people use the Internet. When the Internet was launched in the 1990's websites were

¹⁴ See <http://rian.ie/en>

¹⁵ See

<http://worldwidescience.org/alliance.html>

primarily static pages of text and information. As technology advanced, the Internet upgraded to a newer version. This second version of the web encourages social networking, collaboration and active participation. The web has emerged into a social space. Participation ranges from authoring a blog to posting homemade videos for the world to see. The Internet has grown into a community of online social users. In line with Web 2.0, Lenus includes features such as LinkedIn, Citeulike, StumbleIt, Facebook, Twitter, Digg and others. Both organisations and individuals are currently contributing to Lenus to keep the content enriched and up-to-date. This assists with the democratisation of information as multiple authors and multiple institutions are invited to submit content and to provide feedback on the repository. A critical success factor for the continued success of the repository is 'continued dialogue with researchers within the healthcare system' (Lawton & Manning, 2014).

Promoting research

Lenus aims to promote 'open access' material so that its content is free from embargos and fees. Many journal editors and publishers have given permission to host full text articles. These include the *Irish Psychologist*, *Clinical Psychology Forum* (of the British Psychological Society), the *Irish Medical Journal*, and others. Any article published in an open access journal (see Directory of Open Access Journals; <http://www.doaj.org>) is free to be hosted in Lenus. The types of content that would be suitable to submit include: theses, published articles, conference presentations, small scale research projects, systematic reviews, book chapters,

official reports, and position papers. Where permission is not forthcoming to post full text articles and/or abstracts, individuals can still submit brief article summaries that can then serve as a signpost for accessing the original articles.

The potential benefits of Lenus will only materialise if our HSCPs actively contribute to it. Their doing so will also increase the visibility of, and accessibility to, HSCP-related research. This is important as our HSCPs can demonstrate 'added-value' by disseminating high quality research output that appropriately reflects their typically well-advanced (though not necessarily well-practiced) research competencies. An increased volume of healthcare research (e.g., population health research) may also protect against reductions in funding in this area (Department of Health & Children, 2009).

Until such time as research becomes a competency that is assessed independently in national recruitment campaigns or research activity becomes a quality metric in future evaluations of health service providers, our HSCPs may receive minimal reinforcement for engaging in research. However, in profiling one's work to a global audience, Lenus may provide some means of reinforcement for the research efforts of our busy practitioners.

That research by HSCPs tends to be isolated predisposes to it being weak (e.g., limited external validity). That Lenus has the potential to connect researchers provides opportunities for the development of preferably inter-professional research clusters or communities that draw on the unique

strengths of both academics and clinicians, as proposed by McHugh and Byrne (2011). Such clusters are well placed to constructively address the 'research to practice gap' (HRB, 2009) and to consequently attract increased research funding. For example, an international online community among psychologists would ease collaboration and help to bridge the scientist-practitioner divide (Walker, 2008).

Conclusion

Lenus is of benefit to researchers, to the HSE and to the Irish population at large. It is valuable to any researcher to have freely and openly available information via www.lenus.ie and affords them the opportunity of submitting research and setting up a Researchers page. It facilitates interdisciplinary working and encourages the exchange of information between researchers. Lenus brings benefits to the HSE as an organisation as it provides a return on investment in its employees who have produced theses and research by capturing it in one place and preserving it for future generations. It benefits Irish society at large because it is making public domain information available in an easily accessible interface. This leads to a more informed citizenry.

Nurtured by conducting multiple types of research including effectiveness research (e.g., small-scale research projects) and more rigorous, efficacy style dissertations (e.g., Milne et al., 2008), HSCPs' research competencies are typically highly developed. However, it is debatable whether they are consistently engaging in research activity (e.g., Dowd, Sarma, & Byrne, 2011). We would ask individual HSCPs and their line managers to re-consider investing in research activity and

posting their findings onto Lenus. Doing so will increase the visibility of our HSCPs and position us in leading efforts to embed a scientist-practitioner culture in our health services.

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APPENDIX B: WHAT IS HSELAND?¹⁶

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TONY LISTON

MICHAEL BYRNE

Introduction

HSEland is an online resource designed to support the training and professional development of staff working in the Irish health sector. This resource can be accessed by registering at www.hseland.ie and is available to all health professionals working with the HSE, the voluntary sector and Non-Governmental Organisations (NGOs). Launched by the Health Service Executive (HSE) in 2007, HSEland has become the dominant online medium for developing e-training initiatives for health service staff in Ireland. The focus for HSEland continues to be on the on-going development of learning facilities that promote self-directed learning in a way that is reflective and supportive of HSE strategic and operational priorities. This is achieved by working closely with services at both national and regional levels.

There are currently 77,000 active users on HSEland, with 40 million hits recorded during 2014. The level of engagement across the HSE regions is relatively similar, although hospital staff tend to show higher levels of usage than those in the community

¹⁶This paper is largely based on 'McHugh, P., Byrne, M. & Liston, T. (2012). What is HSEland? *The Irish Psychologist*, 38(7), 188-192' & has been reproduced with the permission of the Editor of the Irish Psychologist.

sector. The success of HSEland is illustrated by a number of awards it has received in recent years. One of the most prestigious of these was the Gold Brandon Hall Excellence in Learning Award. Competing with online learning initiatives from around the world, HSEland was singled out for its positive impact on the health service and its learners and the efforts of the HSEland team. In 2011, HSEland received the top award in the 'Education' category of the National e-Government Awards and was a finalist for the best E-Learning Project at the E-Learning Age Awards 2014.

Advantages of online learning

Before discussing the features of HSEland, it is important to first consider some of the more generic benefits of online learning. It has been proposed that the increased accessibility and flexibility provided by e-learning is one of its greatest benefits to users (Childs, Blenkinsopp, Hall & Walton, 2005). Staff can engage in learning at a time that is most convenient for them, which may be particularly useful for those with limited opportunities for attending training events (e.g., those working irregular shifts). The constant accessibility also allows staff to learn the material at their own pace. This can sometimes be in contrast to face-to-face learning which may overload individuals with excessive information in a short time period. Online learning also avoids many of the traditional costs of learning (e.g. trainer fees, building expenses, administration costs etc.). It should be noted however that the initial set-up costs of an online learning resource can be substantial.

Online learning allows staff to develop skills as they require them. This 'just-in-time' method provides for a more effective learning process by reducing the time between the learning of knowledge and its application. Furthermore, online learning ensures a more consistent learning environment for staff across various locations and organisations. It should be noted however that there are some limitations of online learning compared to traditional face-to-face learning. For example, e-learning may not be suited to the development of advanced skills which require more direct or practical training (Welsh, Wanberg, Brown & Simmering, 2003). Furthermore, some learners may struggle to maintain a disciplined learning structure (Borstorff & Lowe, 2007), while others may struggle with the lack of social interaction and social support associated with online learning (Anstine & Skidmore, 2005). Thus, while online learning is an effective form of training in itself (Chumley-Jones, Dobbie & Alford, 2002), it may be best delivered as part of a range of other training modalities.

Structure of HSELand

The key features of HSELand will be briefly discussed in order to provide new users with basic guidance on how to best use the site for professional development.

My PDP

For users looking to reflect on their development needs and utilise HSELand in a strategic way, My PDP (Personal Development Planning) will be an appropriate starting point. Users may begin with an assessment of their competencies on various dimensions (e.g., managing the service). Results from this assessment

will be automatically generated and will specify whether this is an area of strength or an area in need of development. Assessments can also be carried out by work colleagues, which may be useful in areas that are difficult to self-assess (e.g., leadership). Based on a reflection of the results of their assessment, the requirements of their professional role and their personal goals for professional development, the user is encouraged to develop a learning plan. Users will be asked to specify short and long-term goals and can review and update their plan as their developmental needs change.



Figure 1. My PDP section of HSELand

Learning Programmes

Users of HSELand have access to over 100 online learning programmes, the majority of which have been developed within the HSE with the aid of subject matter experts. These programmes range from a mix of generic modules that are relevant to the majority of health care workers to more bespoke modules targeting certain professions or professional grades. Examples of the former include those programmes related to administrative skills (e.g., Healthcare Records Management), interpersonal skills (e.g., Communication), and IT skills (e.g., Excel Formulas and Functions). Examples of more

bespoke programmes include 'Understanding the Mental Health Act Administrator Role' aimed at mental health staff and 'Service Planning' aimed at those with organisational and management roles within the health service. Some programmes have gained a mandatory status within services, such as 'Hand Hygiene'. Completion of any of the programmes is formally recognised by the awarding of a certificate, which can be used as evidence from continuing professional development. A total of 117,000 e-learning programmes have been completed to date, with over 51,000 in 2014 and 20,000 during 2013. The top four most commonly completed e-programme during 2014 were 'Hand Hygiene for Clinical Staff' (12,657), 'Medication Management' (8486), 'Manual Handling Awareness Programme' (6220) and 'Non Clinical Hand Hygiene (3794).

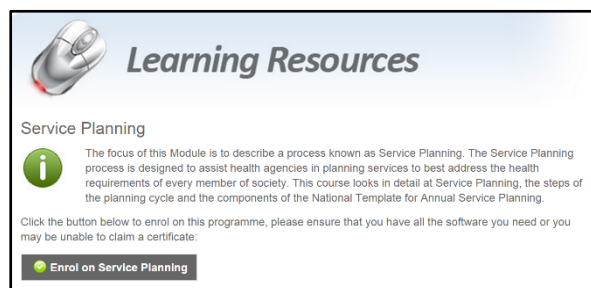


Figure 2: Example of e-learning programme from HSELand

Practice Development Hubs

HSELand has a number of discreet learning hubs that provide educational resources and facilitate knowledge sharing between healthcare staff. Many of these hubs may be described as micro-sites with a multitude of educational resources including e-learning programmes, case studies,

interviews, policy documents, and news/announcements. There are currently thirteen online learning hubs with content relevance to a diverse range of staff. Each hub has defined membership criteria and some are password-protected to provide a secure environment in which to exchange information. As of the end of 2014, the most popular hubs were that of the Change Management Hub (6814 members), St James' Hospital Learning Hub (4416 members), Health & Social Care Professionals Hub (3410 members), Leadership Development Hub (2794 members), and the Medical Education Training Hub (2347 members).

HSELand Developments

The HSELand team will continue to develop the website in order to maximise the quality of the learning resources and enhance the learning experiences of users. For example, HSELand hopes to benefit from a technology and server upgrade to cloud computing to improve its capacity, capability and performance. Furthermore, learners will soon be able to complete an e-portfolio online, with an initial rollout envisaged for medical interns, nurses and midwives.

Table 1. Description of HSELand hubs

<p>Health and Social Care Professionals' Hub The HSCP hub was developed by a subgroup of the HSCP Education and Development Advisory Group and is managed by the HSCP Education and Development Unit. A wide range of resources are available on this hub including access to relevant health service publications, examples of positive practice initiatives, information on practice placement education and guidance on reflective practice. In addition, the hub also seeks to support the research capacity development of HSCPs. Resources include access to articles from this guidebook, presentations from previous HSCP conferences and the most recent survey of HSCPs (McHugh & Byrne, 2014).</p>	
<p>The Change Hub This supports all staff to gain the knowledge, skills and confidence to approach change with their service or organisation. Practical tools are available on planning, managing and sustaining service improvement.</p>	<p>Quality and Patient Safety Hub This hub provides a resource where healthcare staff can access policies, protocols, procedures and guidelines that have been agreed nationally for use within HSE</p>
<p>Improving Quality Exchange Hub This hub has been developed as an information repository and exchange platform for quality improvement initiatives and related resources. It also provides a networking platform for staff involved in quality</p>	<p>The Leadership Development Hub Supports leaders and managers as the HSE moves towards an integrated service. Resources are available in the areas of management development, performance management and coaching and mentoring.</p>
<p>St. James's Hospital Learning Hub An online learning environment commissioned by SJH for staff of this hospital. It provides education & training resources, online e-learning programmes and the ability to collaborate with other members online.</p>	<p>The Learning And Development Specialists Network Hub This hub was developed to support networking, development and sharing of best practice amongst learning and development specialists within the Irish Health Sector.</p>
<p>Mental Health Services Learning Hub Provides high quality educational and training resources to support mental health staff. Resources include mental health e-learning programmes, a learning repository and discussion forums.</p>	<p>The Medical Education Training Hub Users of this hub can learn more about medical training in Ireland and the work of the Medical Education and Training (MET) Unit, including the programmes and scholarships which are supported by the Unit.</p>
<p>Nursing and Midwifery Leadership Hub This hub is designed to support the development of nurse and midwife leaders throughout their career, so they actively participate in leading change and improvement within the health service.</p>	<p>The Integrated Discharge Planning Hub Designed to support healthcare staff who have a responsibility for implementing integrated discharge planning. Membership is restricted to those involved in the National IDP Implementation Group and the Joint Implementation Group.</p>
<p>National Ambulance Service College e-learning Hub The hub provides training resources for Ambulance Personnel, the Irish Coastguard, the Defence Forces, Gardaí, Health Care Professionals and members of Voluntary Organisations.</p>	<p>The SMe Learning Hub In seeking to advance the learning programmes of HSELand, this hub is aimed at people who have developed expertise in subject areas that are relevant and beneficial to the delivery of health services in Ireland.</p>

Another recent innovation is the application of online teaching. Developed by the HSElanD team in collaboration with colleagues from the HSE Finance Directorate, a five week Foundation Programme in Financial Management for HSE Managers combines a virtual classroom environment, e-learning modules, reflective blogging and online resources within the Leadership Development Hub. This represents a new approach to training within the HSE and has received an 'outstanding achievement' award from the Irish Institute of Training & Development under the 'best use of technology' category. In the future HSElanD seeks to create innovative teaching strategies that best utilise the expertise of trainers and subject matter experts.

Conclusions

HSElanD provides healthcare staff with a wide array of opportunities for professional development and allows users a more personalised approach to learning. This online resource removes many of the traditional barriers to training and brings staff from different locations together to engage in collaborative learning. HSElanD provides a key resource for documents on best practice with the Irish health service, thereby helping to ensure evidence-based practice and the achievement of high standards of healthcare. Based on the current success of HSElanD and the commitment to continually enhance the learning experience of users, this online resource will likely play an increasingly integral role in the ongoing professional development of staff within our health service.

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APPENDIX C: RESEARCH AND OPEN ACCESS PUBLISHING

PADRAIG MANNING

Introduction

Open Access (OA) publishing is undoubtedly one of the most significant and far-reaching developments to have taken place in academic research in the last 50 years. It has stirred up controversy, debate and change in both the research community and the scholarly publishing industry, and become an inescapable part of research publication. Many academic institutions and research funding bodies require consent to OA publishing by their researchers, while many others (including the HSE) strongly encourage it. So what is OA?

The term 'Open Access' seems to have been first used in the Budapest Open Access Initiative (BOAI) in 2002. The initiative was the work of a group of academics, researchers and publishers, and its mission statement was bold:

'An old tradition and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment, for the sake of inquiry and knowledge. The new technology is the internet. The public good they make possible is the world-wide electronic distribution of the peer-reviewed journal literature

and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds. Removing access barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge' (BOAI, 2002).

This was followed a year later by a more detailed statement issued at Bethesda, Maryland, following a meeting which featured many of the same participants. The Bethesda Statement went into considerably more detail about what the advocates of OA had in mind for their emerging model, specifying that in an OA publication 'the author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a licence to copy, use, transmit and display the work publicly...subject to proper attribution of authorship'. Furthermore, 'a complete version of the work...is deposited immediately upon initial publication in at least one online repository...that seeks to enable open access' (Bethesda, 2003).

While the Budapest and Bethesda statements crystallised and clarified the underlying concepts, OA had in fact already been around in various forms for a number of years. Cornell University's ArXiv repository was established in 1991 to store pre-prints in the fields of physics, astronomy and computer science. These were made available without charge or restriction.

Two main factors may be said to have driven Open Access publishing – technological developments (specifically the internet), and subscription journal prices. The transformative effects of the internet have of course been witnessed in many fields, but we are dealing here with its capacity to digitise and distribute, rapidly and at little cost, information which could previously only be made available slowly and at considerable expense.

The seemingly inexorable rise of subscription journal prices has long been a source of friction between researchers, publishers and librarians. According to BOAI signatory Peter Suber, 'for four decades, subscription prices have risen significantly faster than inflation and significantly faster than library budgets. Subscription prices have risen about twice as fast as the price of healthcare, for most people the very index of skyrocketing, unsustainable prices. We're long past the era of damage control and into the era of damage' (Suber, 2012). Suber was not alone in his view. 'Subscription rates to scholarly journals continue to increase annually by 8-10%, far exceeding inflation rates as measured by the Consumer Price Index' (Ahmed, Tran, Langdorf, Lessick & Lolfipour, 2008, p. 240). Another study calculated that 'journal prices increased 215% between 1986 and 2003, while the consumer price index rose just 68%' (Albert, 2006). This is in striking contrast to one publisher's claim that between 1998 and 2003 'the unit price of journals increased by an average of just under 1%' (Robinson, 2006), but even allowing for discrepancies involved in measuring different samples using different methodologies over different

periods, it seems that subscription price rises have been steady, significant and perhaps unsustainable, forcing libraries to cut back on their subscriptions.

According to Stevan Harnad, another of the BOAI signatories, 'here is a simple but extremely important consequence of this state of affairs: most research findings are only accessible to a fraction of their potential users' (Harnad, 2011). Since research is largely (though by no means exclusively) funded from the public purse, an ethical issue also arises: should the public have to pay twice for publicly-funded research?

As these factors have coalesced, the pressure for a new research publishing paradigm has increased. That paradigm is Open Access publishing which allows for free, unrestricted, immediate and online availability of high-quality scientific research results (Laakso et al., 2011).

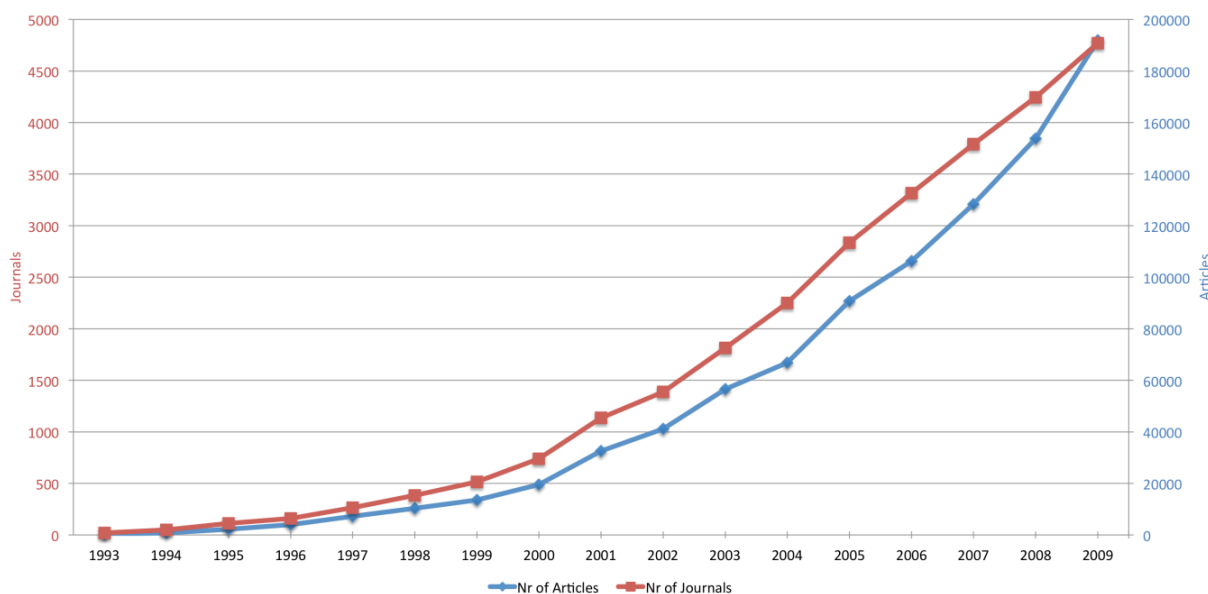


Figure 1. The development of open access publishing 1993-2009 (Laakso et al., 2011).

Green OA

'Green Open Access means self-archiving of the author's work, be it a manuscript, a pre-print version of a manuscript accepted to be published in a scientific journal, or the actual published paper itself' (Laakso et al., 2011). Many subscription journals allow authors to archive these 'author-accepted' manuscripts, that is, the version of an article which has been peer-reviewed but not undergone final type-setting and formatting for publication.

The archiving can be via a personal website or an institutional or subject repository. Repositories are increasingly common in educational or research institutions (these are known as institutional repositories), while others are subject-based. The HSE has its own repository, called Lenus, which operates in conjunction with a number of other Irish health organisations. The advantages of this are summarised by Peter Suber: 'For scholars, repositories are better at making work OA than personal web sites because repositories provide

persistent URLs, take steps for long-term preservation, and don't disappear when the author changes jobs or dies' (Suber, 2012).

Against this, Martin Hall has cautioned that 'While access to the green version of a research paper is very useful in scanning a field for new work, only the version of record has research results corrected after review, final forms of diagrams, tables and photographs, and the final pagination for the purposes of citation' (Hall, 2012), adding that technical limitations might pose problems for text and data mining, thereby hindering the discoverability of researchers' work. Nevertheless, Green OA (also known as self-archiving) of a postprint can provide significant early access advantages to research (Gargouri et al., 2010). Researchers should also be aware that most journal publishers allow for this (Suber, 2012), and that in most cases Green OA availability does not preclude taking the Gold OA route (if in any doubt, researchers can check a journal's terms and conditions – see

below). Finally, it is important to remember that a 'postprint' or 'author-accepted' manuscript *is a peer-reviewed piece of research*

Gold OA

In Gold OA, an author submitting research for publication pays what is known as an Article Processing Charge (APC) to the journal in which they wish to publish. This is intended to cover the editorial and peer-review costs traditionally funded by subscriptions. Upon payment of the APC, the author's research immediately becomes freely available to all. The Gold OA route has proven popular with both authors and publishers, and in 2012 the British government's Finch report (2012) recommended that higher education institutions and research bodies in the UK should adopt this approach.

Under the Gold OA model, the 'burden of payment' shifts from reader to author, and many commentators and researchers have noted that Gold OA, with its requirement to pay an APC of between US\$500-US\$5000 (Elsevier's rates at the time of writing) discriminates against unfunded researchers.

The economic sustainability of the OA model has been hotly disputed. Publishers (Morris, 2005; Robinson, 2006; Seaman & Stewart, 2013) have been at pains to emphasise the material importance of their contributions to the research process, and have questioned how OA publishers will provide equivalent services in the absence of subscription income. For true OA journals - that is, those that offer full and free access to readers, running costs have to be met somehow. Technological advances may have eliminated paper, printing

and postage costs, but repositories, servers, maintenance and staff still cost money.

As seen above, Gold OA is currently the most widely-applied funding model, where authors, or more commonly, their funding institutions – one study found that just 12% of authors personally paid (Dallmeier-Tiessen et al., 2011, p. 9) - pay Article Processing Charges (APCs) to cover the cost of publication. The often high cost of these (see above) has led to their enthusiastic adoption by both OA and subscription-based (so-called 'hybrid' journals) publishers. As Suber observed of the latter, "the publisher has subscription revenue for the conventional articles, publication fees for the OA articles, and sometimes both at once for the OA articles" (Suber, 2012).

The sometimes high costs of the Gold OA model have come in for considerable criticism, not least from Stevan Harnad, who accused the publishing lobby of influencing the British government's decision to support Gold OA (Harnad, 2012) and maintained (2011) that moving to full Green OA would render the subscription model unsustainable and obsolete, leading to Gold OA by default. Suber (2012) on the other hand suggests that this stance may be unrealistic and that Green and Gold OA can be seen as complementary, each having certain strengths and weaknesses.

A number of authors have proposed mechanisms to address the funding issue, arguing that 'some countries might transfer parts of current subscription budgets to the research sector, earmarked for publication

costs' (Vigen, 2007), although Harnad noted that institutions would not have the money to pay their authors' gold OA publishing costs while those funds were still tied up in paying for journal subscriptions (Harnad, 2011). The Gold OA model is still evolving, as are mechanisms to sustain it.

Scientific impact in OA

Since Open Access journals began to appear around 15 years ago, many researchers have attempted to measure their scientific (or citation) impact. This after all is one of the key drivers behind researchers making their work freely available – to increase citation and recognition of their work (Antelman, 2004, p. 373). Many of the early studies into citation impact demonstrated an advantage to publishing in OA journals, although these findings were challenged on a number of grounds, notably self-selection bias, where authors make available only those papers which have already achieved some degree of recognition. In other words, one could argue that the articles are online because they are highly cited, rather than being highly cited because they are online – effectively as 'trophies' (Eysenbach, 2006, p. 0697). Other studies supported this 'self-selection bias' argument, using statistical analysis to demonstrate that OA-published articles enjoyed no discernible advantage in citation impact (as cited in Xia & Nakanishi, 2012, p. 41).

The claim by OA proponents that OA offers impact and citation advantages has been contested by some researchers (Davis, Lewenstein, Simon, Booth & Connolly, 2008), while others – though admitting that moving to an OA model can increase usage figures – contend that spiders, bots and other automated web-crawling mechanisms actually account for much of the increase in 'readership' (Nicholas, Huntington & Jamali, 2007, p. 13-14). However, more recent studies do appear to indicate a definite citation advantage for papers published in OA journals (Bjork & Solomon, 2012; Gargouri et al., 2010), and the weight of evidence now strongly supports the OA citation advantage. It also appears that one fear of traditional journal publishers – that OA publishing will result in increased citation of low-quality, otherwise unusable papers – has not so far come to pass (Gargouri et al., 2010). Interestingly, a 2013 study by Archambault et al. confirmed a citation advantage of 19% - 34% (for health sciences and clinical medicine respectively) but found that the advantage was concentrated in the Green and hybrid journals (Archambault et al., 2013, p.16); the authors attributed this in part to the relative newness of Gold OA journals, which take time to establish themselves.

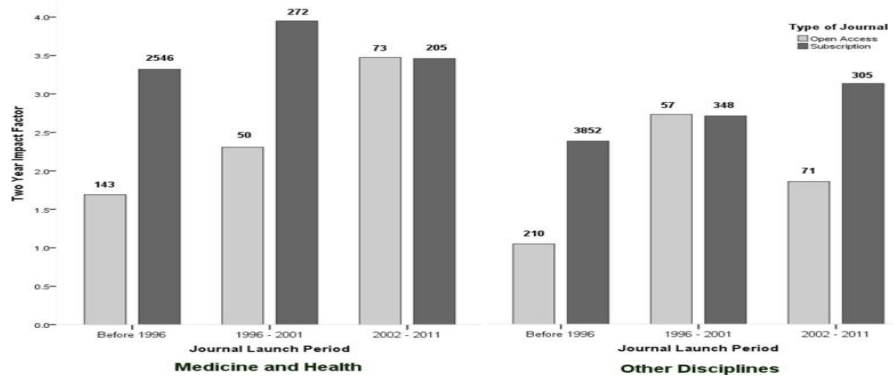


Figure 2: Citation averages as a function of the journal start year for medicine and health versus all other disciplines (Bjork & Solomon, 2012).

Quality control

Open Access is a new, dramatic and disruptive paradigm in scholarly publishing, and it has not been without its critics and opponents – nor without resistance from established interests. The publishing industry’s response to OA has been predictably unenthusiastic, if not hostile. Objections to Open Access publishing have tended to focus on either economic sustainability or quality control. From quite early on, publishers have been concerned at what they saw as a potential loss of income and influence. They argued that the Open Access model made insufficient provision for expert publishing tasks as proof-reading, reference checking, managing the peer-review process and archiving (Morris, 2005). Seaman and Stewart (2013) pointed out that ‘...copy-editors and proofreaders do much more than correct grammatical and spelling mistakes – detailed quality control is by far the greatest expenditure’. And they noted (with a perhaps understandable note of frustration) that ‘Green OA repositories may be ethically desirable, but they undermine the subscription-based system by taking a value-added service provided by the publisher (e.g., organisation of

the peer review process) and then dodging the bill for it’.

Coherent and transparent editorial policy and ensuring rigorous peer review – quality control, in other words – are the basis of any serious scholarly journal (Driscoll, 2010), and subscription journal publishers have made this point repeatedly. Andrew Robinson, Director of Medical Publishing at Blackwell suggested a scenario where ‘the end result [of Open Access] will be an undifferentiated pool of unreviewed research which will, because of its lack of structure, not only halt the diffusion of innovation to the same vital research organs, but also challenge the viability of the whole body by affecting other systems such as peer review’, and arguing that under the traditional paradigm, ‘researchers have never had it so good’ (Robinson, 2006 p. 1454-5). Robinson rejected the ethical and economic arguments made by Open Access proponents, and issued a dire warning about the potential damage that Open Access might wreak upon research publishing: ‘if you think that mass extinction of journals is an overstatement, then think again’ (p. 1458).

Although publishers often overstate their contribution to the peer review process (the bulk of which is carried out by external reviewers and referees who receive no payment for their work), they are responsible for coordinating a complex and time-consuming process. This requires dedicated staff. Open Access publishers have been accused of downgrading peer review, or even omitting it entirely. Seaman and Stewart (2013) expressed particular concern, asking 'Will publishers that invest heavily in quality control be able to compete with 'cheap' OA providers that forego strict peer review, as well as copy editing and typesetting, i.e. producing what is almost 'grey' literature, and providing no more service than any 'green' OA repository?' While this arguably misrepresents the services provided by repositories (which have nothing to do with peer review or editorial practices), it raises a fair point about the challenges faced by OA publishers – to maintain quality control and overcome accusations of low standards.

Copyright

A brief point needs to be made regarding authors' copyright. While policies vary from one publisher to another (and from one journal to another), standard practice in subscription publishing has been for the author to sign over copyright to the publisher, who exercises exclusive rights to its re-use. Robinson (2006, p. 1455) saw no problem in this, claiming that authors attached little importance to copyright issues. There is a degree of truth in this, but in a world accustomed to online information sharing it can lead to awkward (to say the least) situations. In December 2013, Elsevier issued

thousands of takedown notices to researchers who had posted copies of their articles (to which Elsevier owned the copyright) on the U.S. academic social network Academia.edu (Swoger, 2013). Elsevier's action was entirely legal – which is precisely the point. The authors had signed away their right to share their work with others, in exchange for the prestige of publishing in a high-ranking journal, but had not realised the implications of doing so. Given Irish researchers' practice of sharing their published work on similar sites like ResearchGate, there is every likelihood of a comparable occurrence here. When publishing in an OA journal researchers retain full rights to their work, which they can then licence to one or more journals under a Creative Commons type agreement (see below).

Predatory journals and dubious publishing practices

Jeffrey Beall, a librarian in the University of Colorado, is a noted critic of Open Access publishing, and the compiler of 'Beall's List' (<http://scholarlyoa.com/2014/01/02/list-of-predatory-publishers-2014/>) of predatory journals, a website devoted to challenging the standards and ethics of Open Access journals. As Beall (2012) notes, many self-proclaimed 'Open Access' publishers do not identify an editorial board or provide information about review board members, they lack transparency about their operations and they make unsolicited 'spam' requests for submissions. They exist to make money from APCs, despite providing little in the way of peer review or quality control. Beall's charge is that such publishers are effectively running scams, targeting gullible or

unscrupulous researchers and operating as vanity presses.

Admittedly, Beall's opposition to OA goes beyond concerns over sustainability or quality his rather vociferous assertion that 'the open-access movement is a Euro-dominant one, a neo-colonial attempt to cast scholarly communication policy according to the aspirations of a cliquish minority of European collectivists'. Early funding for the open-access movement, specifically the Budapest Open Access Initiative, came from George Soros, known for his extreme left-wing views and the financing of their enactment as laws' (Beall, 2013) is both intemperate and inaccurate, (as well as somewhat ironically being published in an Open Access journal) and was equally forcefully rejected by OA advocate (and signatory to the BOAI) Michael Eisen (2013). Nevertheless, his criteria for determining quality in OA journals are valid, and he has played a key role in highlighting the threat of predatory journals and in holding OA journals to the same rigorous standards as their subscription-based counterparts.

The phenomenon of predatory OA publishing is a salutary reminder of the potential pitfalls of online life. From dating sites to phishing to the ever-present '419' banking scams and offers for prescription drugs, internet users always need to be vigilant about the bona fides of those they deal with in cyberspace. This is as true for researchers and journal publishers as it is for anyone else, and Beall's List is an excellent guide to the frauds and charlatans who seek to make easy profits from the work of researchers.

It is worth remembering, though, that fraud and lapses in quality control are not the sole preserve of the OA model. Seaman and Stewart (2013), while stoutly defending the editorial services provided by publishers, acknowledge that peer review 'does not guarantee a scientifically accurate report'. The now-notorious 1998 study by Andrew Wakefield, suggesting a link between autism and the MMR (measles, mumps and rubella) vaccine was published in the *Lancet*, a traditional, peer-reviewed subscription journal. More recently it was discovered that the medical publishing giant Elsevier had effectively published a fake 'journal' of articles selected to emphasise positive findings about drugs manufactured by Merck (Masnick, 2009a). While Elsevier protested that its publication was not a journal as such, it went to great lengths to create just that impression in the minds of its readers. Elsevier also conceded that the publication was not a one-off; six such 'journals' had been published (Masnick, 2009b). As it is, while attention has naturally focused on the problems encountered in the new and still-evolving OA model, the existence of the same problems in the subscription model has tended to receive less attention.

OA Resources

While scholarly publishing continues to develop in both its subscription and Open Access forms, and while the latter is still maturing as a platform, it now seems clear that Open Access is here to stay, and that it offers considerable advantages to researchers. The following are some of the OA resources they should be aware of.

Creative Commons

Creative Commons (CC) is a U.S.-based non-profit organization dedicated to facilitating the sharing of content on the internet, while permitting the creators of that content to retain full copyright and intellectual property rights. CC does this by providing a suite of standardised licences which content creators can attach to their work, and which allow for varying degrees of sharing and re-use. As CC emphasises, these licences do not replace existing copyright. Rather, CC 'work[s] with copyright experts around the world to make sure our licenses are legally solid, globally applicable, and responsive to our users' needs' (www.creativecommons.org/about). By using a CC licence, researchers can stipulate the degree of access and re-use which they are willing to grant.

Sherpa/RoMEO

Maintained by the University of Nottingham, SHERPA / RoMEO (<http://www.sherpa.ac.uk/romeo/>) is an invaluable database detailing the self-archiving (Green OA) policies of journal publishers. If you wish to make your pre-print available in a repository but are unsure whether your agreement with a publisher allows this, RoMEO is an easy way to find out.

Open Access Scholarly Publishers' Association (OASPA)

OASPA (www.oaspa.org) is an alliance of OA journal publishers. It sets quality standards for OA journals, advocates for Gold OA and engages in awareness-raising activities.

Beall's List

As noted above, Beall's list of predatory journals is a vital tool for those wishing to publish in an OA journal. Beall provides a list (updated periodically) of publishers who fail to meet the ethical or scholarly criteria which would safeguard publishing quality.

Directory of Open Access Journals (DOAJ)

The DOAJ (www.doaj.org) is a comprehensive list of OA journals (at the time of writing it has indexed an impressive 10,228 journals in 136 countries) that should be an essential part of any researcher's toolkit. Importantly, given the ongoing controversies and misconceptions surrounding OA and scholarly quality, the DOAJ has a strict set of criteria to be met by any journal seeking inclusion in the list – notably, that the journal should be scholarly, peer-reviewed and fully OA (i.e. there should be no embargo period for articles). The DOAJ also has an article-level search facility, allowing for searching within and across journals.

Lenus

Lenus (www.lenus.ie) is a multi-institution health repository, established and maintained by the HSE since 2009. It indexes grey literature and academic / clinical research relating to health in Ireland. Researchers can deposit their published work quickly and easily, making it immediately accessible to a wide audience. Lenus is Ireland's largest health repository, containing more than 20,000 items as of February 2015. Health and Social Care Professionals have a dedicated collection within Lenus to house, preserve and disseminate their research. Research deposited in Lenus is also made available in RIAN (www.rian.ie), which gathers together the research output of the main Irish third level education institutions. RIAN is a portal for Irish Open Access research.

Open Access and the Irish health services

A coalition of 20 Irish organisations – the National Steering Committee on Open Access Policy - backed the National Principles for Open Access Statement launched in October 2012 by Minister of State Sean Sherlock (National Steering Committee, 2012). This reaffirmed the principles espoused in the Budapest Open Access Initiative back in 2002 and was swiftly followed by the HSE's Open Access publishing statement in 2013 (Lawton, Morrissey & Sayers, 2013), which gave real impetus to Open Access publishing within the Irish health services and provided strong encouragement for making Irish health research available via OA.

Conclusion

With the increasing success of OA publishers like BioMed Central and PLoS, high-quality OA peer review is an established reality according to the study by Archambault et al. (2013 p. 18). Ireland is one of eight EU countries to have reached the 'tipping point' where 50% of its published research is OA. OA publishing has demonstrated impact and citation increases over non-OA research. It is a viable professional and ethical alternative to traditional subscription-based publishing. It is not flawless, "but the larger picture is clear: we are headed for an open access world that will replace traditional subscription publishing with systems of distributing new knowledge that are far more appropriate to the immense opportunities of new digital technologies' (Hall, 2012, p. 239). As such, Irish researchers should not hesitate to embrace it.

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