**Learning activity 2. Critically analysing a research paper**

The aim of this learning activity is to develop skills in what to look for in a typical research paper.

***This worksheet can be used to guide your own personal reading of research papers. It is also very useful to work in a group, or become a member of a journal club, where several people read and then discuss the same paper. Different people see different things in the same paper – no matter how closely you have analysed a paper, you will find that other will pick up on details and issues that you have not noted.***

***A valuable strategy, either when reading a paper on your own, or as a group, is to read a paper first from an ‘affirmative’ position, looking for all the useful knowledge and insights that are in the paper, and then from a ‘sceptic’ position that focused on the limitations, ambiguities, potential biases, errors, etc.***

For the purpose of this exercise, a research paper is defined as a journal article with method and results/findings sections, that provides an account of a specific research study.

The structure of a typical research paper (i.e., sections and sub-headings, and what they mean) is explained in Chapter 2 of *Doing Research in Counselling and Psychotherapy* 4th edn.

An initial reading of a paper operates at the level of developing knowledge and awareness: building an appreciation of how different research approaches are used, how research questions are formulated, procedures for data collection and analysis, etc. Initial reading also generates ideas about how the ideas or findings in that paper might influence one’s practice as a therapist.

***The following questions provide a basis for a more searching critical analysis, that identifies the strengths and limitations of a study and a more fine-grained understanding of what it offers and how it can be used.***

When critically analysing a research paper, it is essential to retain a sense of *appreciation*. It s always possible to find flaws and limitations in any piece of research – the perfect research study has never been, and never will be, conducted. At the same time, any study that is published in a reputable journal, will have undergone a process of review, and should have achieved an acceptable level of methodological rigour. Even if a study has not been published in a journal, or ha clear flaws, it is worth reading – if someone has made the effort to collect and analyse information, and has done this with integrity, what they report will have something useful to add to our stock of knowledge.

It is very unlikely that any specific research study will have much significance in itself. The significance of a study always lies in its relation to the broader picture. A research study can be viewed as a piece of a mosaic – the pattern only emerges when standing back and looking at the mosaic as a whole.

There are three key questions to keep in mind when critically analysing a research paper:

1. **What can I learn from this paper, about the substantive topic that it has investigated?** **What is the ‘news value’ of the paper - what does this study add to my/our stock of knowledge?** How can I summarise the addition to knowledge that it represents? (Often, this is a fairly easy question to answer, because the paper itself will make knowledge claims, in the abstract and elsewhere. However, as a discerning reader, it is necessary to come to a view on the extent to which you agree with the authors’ conclusions, or have a more nuanced understanding of the value of the paper. Also, there are different levels of complexity of statements of ‘what I have learned from this paper’, depending on the context in which the statement is being made. For example, if you are writing a literature review and the paper is included in the coverage of background literature, you might want to make a brief statement of what it signifies. By contrast, if you are looking closely at the study as a guide to practice, or as a source of ideas about how to conduct your own study you will need to carry out a more detailed point-by-point itemisation of what you have learned from it.
2. **What are the limitations of the paper?** How can I get the knowledge claims of the paper into some kind of perspective? What are the aspects of the paper that may be ambiguous and open to different interpretations, and point toward a need for further research? (Again, the authors themselves will provide the reader with a starting point for this, by providing their own critique of the weaknesses of the study. However, the authors obviously believe in the value of what they have found, and so their own critique is likely to oriented toward presenting their work in a positive light). When considering the limitations of a study, there are many questions that can be asked. However, there are some key question that any critical reader **always** needs to consider:
   1. **The literature review.** How has the researcher chosen to contextualise their study, in terms of the literature summary at the start of the paper? Are there any important issues, themes, or previous studies, that are absent from the review? What is the story that the researcher is trying to tell? How adequately does the researcher explain the rationale for their study in relation to previous knowledge?
   2. **The sample.** Any research study is based on a *sample* of the total population. What are the implications of the sample for how the results of the study can be understood? What are the biases that are associated with the specific sample that has been achieved? To what extent, and in what ways, is the generalisability, meaning and significance of the study limited by the sample that was used? Examples: A survey questionnaire is sent out to members of the public, and achieves a 30% response rate – are the people who responded typical of those who did not reply, or could there be some kind of meaningful difference between them? A therapy outcome study is based on results from clients who have been carefully screened in terms of specific symptoms – can the results be generalised to routine primary care clients? When commenting critically on sampling, it is important to try to get beyond simple statements such as ‘the sample may not be representative…’ and try to think through the possible ways in which the sampling procedure may have influences the results. For example: ‘the survey questionnaire was quite complex, and so the people who completed it may have been from a higher educational level – the results may therefore fail adequately to reflect the views of less educated people’, and ‘in recruiting clients who only reported symptoms in one area of symptomatology, the outcome study may be over-estimating the effectiveness of this intervention, because many clients seen in routine practice are likely to report multiple problems/co-morbidity’.

* 1. **The research procedures.** What actually happened to participants in the study? To what extent, and in what ways, were the results of the study shaped and influenced by the procedures that participants went through? This phenomenon has been observed many times in experimental psychology research, and has been labelled as the ‘experimenter effect'. The classic example in therapy research is when clients are randomly assigned to a treatment condition or a waiting list condition – the clients in the latter group realise that they are missing out, and may possibly convey their irritation through their response to questionnaires they are asked to complete. It is always worth imaginatively reconstructing the experience of a participant in a study (‘what would it have been like, to have taken part in this study?’), and reflect on how this experience might have led these people to answer the researcher’s questions in a particular way.
  2. **Operationalisation.** Do the measures, instruments or interview questions reflect the actual phenomenon being studied? A familiar example here is the old issue of the nature of intelligence – is it ‘what intelligence tests measure’, or is there more to it? In therapy research, the researcher cannot directly or comprehensively assess the participant’s attitude to counselling, level of anxiety, or perception of the helpfulness of a therapist statement. Instead, the researcher must construct a series of operations through which the phenomenon of interest can be described and /or measured. So, in therapy research, a person’s attitude to counselling is ‘what the attitude scale measures’ or their depression is ‘what the Beck Depression Inventory measures’. But – how adequately does the instrument measure the actual factor or phenomenon? It is useful to imagine being a participant in the study – if you had been completing the attitude questionnaire yourself, do you think that it would fully capture what you thought? Some of the big debates in psychotherapy research hinge on matters of operationalisation. For example, the studies that report the best results for CBT in depression use a questionnaire that is highly sensitive to CBT outcomes (the Beck Depression Inventory), while the studies that report good results for anti-depressant medication tend to use other depression measures, such as the HAD scale (which has more questions on physical symptoms). In qualitative research, the investigator probably has no more than a one-hour interview to try to collect a detailed account of what has in all likelihood been a complex and ambiguous set of informant experiences and memories. It is therefore necessary to use an interview schedule that probes for aspects of experience that the researcher believes are central – inevitably, potentially significant themes may be downplayed, or missed completely.
  3. **Data analysis and reporting.** If a study has been published in a journal that uses an anonymous peer review process, it is unlikely that there will be any overt errors in the data analysis (e.g., mistaken choice or use of statistical procedures, or application of a qualitative methodology that glaringly departs from standards of good practice). Driven by a constant effort to improve research techniques, it is possible to find debates within the research literature about the pros and cons of different approaches to data analysis. However, on the whole it is reasonable to assume that the general approach to data analysis deployed in a paper is within the bounds of what was considered as appropriate at the time that the study was carried out. Nevertheless, there are two questions around data analysis and reporting that should be considered in a critical analysis of a study:
* What might the findings have looked like if data had been analysed using a different approach? For example, outcome studies based on symptom questionnaires completed by clients and the start and finish of therapy often conduct complex statistical analyses of factors that contribute to change. What would the findings look like if simple proportions of clients who had recovered, improved, stayed the same, and deteriorated have been reported? Or, most qualitative studies report themes that emerge across the whole sample of participants. What might the findings have looked like if patterns in individual cases, or groups of cases, had been reported?
* Given the data that were collected, is there any information that you think would be potentially interesting, that have not been reported in the results section of the article? For example, in a quantitative study using symptom measures, you might be interested in seeing the range of scores recorded by clients (and average/mean scores), so that you can think about the similarities and differences in symptom severity between the study participants and the clients you work with in your own practice (or clients in other research studies). Or, the interview schedule in a qualitative study may include interesting questions, but the kinds of things that participants said in response to these questions are not reported.
  1. **Bias.** Do the researchers have an axe to grind? Are they consciously or unconsciously biased? Is the researcher’s stance, pre-understanding or potential source of bias explained in a transparent manner? Very few researchers are consciously biased (i.e., fraudulent). However, almost all researchers are unconsciously biased, in so far as they have a particular stance in relation to the topic. The careful, detailed reporting of research procedures, operationalisation, analysis of results, etc, and then the process of peer review of articles, are all intended to address this issue. Nevertheless, some bias always remains. The big example of this in psychotherapy research is Luborsky’s analysis of ‘researcher allegiance’ in therapy outcome studies – researchers trained in CBT tend to fund that CBT is more effective than other therapies, researchers who are psychodynamic practitioners tend to find that psychodynamic is more effective….etc. In considering possible bias, it is important to think about what might be missing from a study, and why it is missing. It is also worth looking closely at the detail of the results, and thinking how you would yourself interpret what they mean, and then compare this with the conclusions drawn by the researchers – for example, in their discussion and conclusions, authors often gloss over ‘findings’ that do not fit the story they are trying to tell.

1. **What can I learn from this paper, about the method that has been used to investigate the topic?** Competent users of researcher, and researchers, are not only interested in what a study tells them about the topic/phenomenon that is being studied – they are also interested in the methods that have been used. In what ways has the approach taken by the researcher appear to have been effective in yielding a good understanding of the topic? Are there innovations in method that seem noteworthy? In what ways does the method have limitations, as a means of exploring this particular topic? When I reflect on the research-based knowledge I have accumulated on this topic, is there a tendency for certain methods (e.g., qualitative) to be associated with certain types of conclusions, while other methods (e.g., quantitative) produce contrasting or even contradictory findings? Each paper that you read adds to your appreciation of method, which in turn helps you to be more critically sensitive in relation to the next paper that you read. Sometimes the method is more interesting than the results. For example – a study of different therapy styles of making empathic responses to clients did not come up with any striking new insights – but way that the researchers defined and classified these styles, and the rating scale they developed, might help a reader to grasp the meaning of these styles, and might be a valuable tool to use in training and supervision.
2. **Next steps.** No single research studyis ever sufficient in itself – to build a reliable knowledge base it is necessary to refer to other studies. If a study is relevant to the development of your practice or your own research, it is necessary to connect it up to other studies on the same topic, or that have used the same (or similar) methods. The reference list of the study you have read should provide some clues to further reading. Entering the details of the study into Google Scholar, or its key words into a library search engine, will yield other potentially useful sources.

**Finally**

Critically analysing a research paper is a skill, that can be learned. It is helpful to look at how other people perform this skill. If you are new to this skill, you will almost certainly find it hard at first – research papers will appear obscure and boring. But, as you become able to read papers quickly, and are able to ‘fillet’ them for the information you need, you will find that research papers will become an increasingly valuable point of reference for your practice as well as your research.

With any study that is particularly relevant to your practice or research, it can be useful to read it more than once. If you read a paper, make notes on it, and then come back to it some time later, you will almost always find important information and insights that you missed first time round.