Saddle Research Trust

A Horse Owner's Guide to Interpreting Research

Part 7: Sourcing and Reading Scientific Research

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Research is the systematic investigation of a topic or question in order to discover new information, establish facts, and reach new conclusions. Within scientific research, of the type we have been discussing in this series, researchers will follow the **scientific method** to formulate and test their **hypotheses**. They will design **experiments** to address the given hypotheses, and these should be **valid**, **reliable**, and free from **bias**. They will ensure that experiments involving animals are conducted **ethically** and gain ethical approval before they start. They will then collect their **data** and **analyse** them using the most appropriate techniques before drawing **conclusions** which address their original hypotheses. Once this process has been completed, researchers then need to write up their findings, usually in the form of a full scientific paper or a shorter conference paper to share them with others. In this final instalment of this series, we will talk about the academic publishing process, the structure of a scientific paper, and where to find reliable sources of information on equine research.

Researchers have two main choices when considering where to publish their research. Small or preliminary projects can often be presented as a **conference paper**, and longer, more developed projects are typically submitted as a full research paper for an **academic journal**. Both options usually require the work to undergo a **peer review** process. This means that two (or sometimes three) other researchers in the same field have read and commented on the paper, and often requested changes, before it is published. This process is intended to ensure the quality of the research presented in the journal or conference.

Figure 1: A selection of journals which cover equine science topics.

A research paper which reports directly on a project conducted by the authors is referred to as **primary research**. Articles of this type tend to follow a defined structure. The main body of the article starts with an **introduction** which includes a review of the existing research in the area to set out what is currently known and explain the knowledge gap that the paper is aiming to address. The introduction usually closes with a statement of the aims or hypotheses of the study. The second section is the **methodology**, sometime referred to as materials and methods. This is where the researchers explain what they did; a well written methodology should allow another researcher to repeat the study exactly. This should include details on the sample population (horses or humans in the study), the equipment used, the process of collecting the data, and how the data were analysed. After this comes the **results** section, where the researchers set out the results of their analysis of the data. This is typically followed by a **discussion** section, where the researchers will aim to explain what their results might mean, how they fit into the existing body of research in the field, and how they might be applied in practice. This section will usually include discussion of any **limitations** of the study; this is things that may affect the application of the results and should be considered when interpreting them. For example, if a study used only Thoroughbred ex-racers, it may not be generalisable to other breeds. The discussion will then close with an overarching **conclusion**. This may have its own subheading, or just be the final paragraph of the discussion. Here the researchers will highlight the take home messages from the discussion. Research articles also contain an **abstract**. This is a summary of the key points of the paper across all sections and is typically displayed at the top of the paper. The abstract allows you to see the main messages of the paper to see if it is worth reading the full text, i.e. does the paper address the issue that you are interested in?

It can be time consuming and often confusing to read a lot of primary research on a topic, especially if you are new to the topic and want to get an overview to pick up the key points quickly. This is where good quality **secondary sources** can be helpful. A secondary source is written based on primary sources. Good quality secondary sources are **review articles** and **academic book chapters**. A review article is something that is published in a peer-reviewed journal and meets all the same standards as a primary research article, but their goal is to bring together existing research in the area rather than to add anything new. There are a few different types of review article, but they can be broadly split into **systematic reviews** and **narrative reviews**. A systematic review requires researchers to follow a set process to identify all the existing research that meets certain criteria relevant to their research question or aim, and to extract and present the information from all the papers in the same way. A nice example of this can be seen in a 2011

study by Wylie et al. which pulled together the evidence from 69 studies on laminitis prevalence [1]. A narrative review is usually written by an established expert in the field and allows them to select and communicate the research and ideas that they feel have most value. This is not too dissimilar from an academic book chapter on a topic, which again are written by experts in the field and will contain many references to research. However, expert review articles can be made freely available to the public, whereas academic textbooks tend to be quite costly.

A good place to start in looking for academic research is **academic specific search engines**. If you have a university affiliation there are many of these to choose from, but even if you don't anyone can search specifically for scientific literature using Google Scholar [2]. Here you will be able to read the abstracts of any papers that meet your search terms. Some academic journals and articles are what is known as **gold open access**, which means that anyone can read the full research paper. However, many are behind a **paywall**, so you will be able to read the abstract, but not the full paper unless you have a subscription. These subscriptions are expensive, and most researchers rely on university library subscriptions to be able to access these journals. Sadly, researchers do not get paid for publishing their articles in academic journals. In fact, if an article is gold open access this usually means that the researcher has had to pay the publisher, as the journal will be unable to collect fees from the readers. Many researchers cannot afford these publishing fees, which makes it difficult to disseminate research to the wider public. However, many journals have a **green open access** policy, which allows researchers to publish their own version of the article (not using the journal's layout or formatting) on a repository after an embargo period, which is usually 12 or 24 months. Google Scholar will often pick up these repository versions of an article, so it is worth looking at all the available versions of an article to see if there are any that you can read for free. If you are spending a lot of time looking for and reading research, you may want to set up a ResearchGate [3] account. ResearchGate acts like social media for research; researchers can set up a profile and upload their work, you can follow researchers whose work you are interested in, and you can contact them to request private full-text versions of their paper if it is not open access.

We have talked a lot about journal publications, but I also mentioned that researchers can present their work as a **conference paper**. These are shorter papers which are either presented as a short talk, usually of 10-12 minutes, or an academic poster at a conference event. These conferences are costly to attend, but it is often possible to access the abstracts of all the work presented. Some conferences such as the International Conference on Equine Exercise Physiology (ICEEP), will publish their collection of abstracts as an open access article within a journal [4], while others, such as the International Society of Equitation Science will publish these **proceedings** on their own website [5].

Hopefully this instalment has given you some ideas of how you can access information on equine research if you want to look at it. Really getting into the scientific research is time consuming, and it's not for everyone. There are also lots of organisations and publications that aim to communicate scientific information in a way that is easy to read and understand. Here at the Saddle Research Trust, we send out regular newsletters with articles about new research publications and we publish articles on our website [6]. You may also see articles related to the horse in other mainstream science magazines and web sources [7]. Remember that any magazine or online article that is talking about a research project should include a reference which gives details on exactly where to find the original research paper so you can read it if you wish. If this is not present, then you should question the validity of the evidence presented in the article.

I hope that you have enjoyed this series, and that it has given you the confidence to read some of the growing body of research in this area, and hopefully to start thinking about how we can apply some of this knowledge in practice to enhance the welfare and performance of the ridden horse.

References

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