Tips for Writing a Research Manuscript for the *Journal of Strength and Conditioning Research*

According to Dr. William J. Kraemer, Editor-In-Chief of the *Journal of Strength and Conditioning Research*, the following points should be noted when preparing a manuscript.

The final stage of a research project is the writing of a manuscript which ultimately allows your work to become part of the “body of knowledge.” Development of a manuscript involves the careful inclusion of all of the relevant information so that your research can be understood as well as replicated by others. It is important to be concise and clear. Remember any ambiguity creates confusion in the reader’s mind. The purpose of this article is to give some basic “tips” for authors intending to develop a research manuscript for the *Journal of Strength and Conditioning Research (JSCR)*.

A research manuscript has specific sections which are stipulated in the “Guidelines for Authors.” Each section has a specific purpose as part of the whole manuscript. Understanding the symmetry of the different parts of the manuscript and how they relate to each other is important for development of a cogent publication. Carefully read the “author guidelines”, examine several recent articles in the JSCR, and format the paper properly. This will save time, allow for a more efficient processing of your manuscript, and show the reviewers that you are careful in your work and respect the requirements of the journal’s format.

Make sure that you carefully check your functional writing composition, style, and syntax. Make sure you have proper paragraph structure; each paragraph should start with a topic sentence and end with a transition sentence to the next topic. Make sure that there is logic and symmetry to all of the parts of your paper. Make sure that your submission is not a first or second draft. Undertake internal review for both content and language, and develop a document which has been thoroughly reviewed by co-authors and colleagues prior to submission. Submit only a polished product after you have gone through a draft sequence and review process within your own scientific team.

**Introduction**

The primary purpose of the introduction is to develop your hypothesis that will be tested by your research design. It is also important that the question your research is addressing is clear. This section ends with the obvious purpose statement if the author has been attentive to its development. The introduction can be a challenging part of the paper as it sets up the entire project in its context and importance.
Carefully think about how your words relate to the ideas and images you create in the reader's mind. Clarity is of vital importance throughout the paper and getting off on the right foot with the introduction is essential for a solid paper.

**Important Points to Consider:**
1. In general, the introduction should be kept to about three to five paragraphs and the author must remember that this is not a review paper.
2. There should be a logical sequence of ideas leading to the purpose statement. Ultimately the question that is being addressed needs to be evident to the reader as well.
3. Within these introductory paragraphs the context for the problem should be clear and its importance underlined.
4. Support for a specific hypothesis(s) should also be obvious to the reader.

**Other Features of a Solid Introduction Include:**
1. A focused narrowing leading to purpose of the research.
2. Support is created for the need and importance of the research.
3. Implications as to how the problem can be solved or the question answered.
4. Address the potential criticisms and major debates that might surround your problem, hypothesis, methods, and/or question. Show you are aware of what we know.
5. Carefully check the logic of the introduction and that it relates to the other parts of the manuscript. Do not discuss topics in the introduction that will never be addressed by your research project. Remember to make sure that your introduction fits together with the other parts of the paper.

**Methods**
The methods section is important for other scientists to understand what you did and be able to replicate your study. Thus you must be very specific as to the equipment you use, its source, and provide direct references to methods. Make sure to avoid excessive use of subheadings and try to achieve a logical flow of your methods section as it relates to the actual flow of the experiment.

It is vital that you include appropriate statements as to informed consent and Institutional Review Board or Ethics Committee approval of your project relative to human or animal research. Make sure that you are clear as to having briefed all
human subjects as to the risks of the research prior to being given the opportunity to provide written informed consent.

In this section you need to start with the “Approach to the Problem” section which tells the reader how your experimental design will be able to test the hypothesis developed in the introduction. You need to give your rationales for selection of your independent and dependent variables and then further develop such concepts throughout the methods section.

**Important Points to Consider:**

1. Describe your procedures to the point where someone can replicate your work (e.g., provide names and model numbers for instruments, city, state, country).

2. If you use a reference to a method make sure that you tell the reader it was done exactly in that way as readers are frustrated in trying to replicate work in which one reference leads to another reference which leads to another reference and so on ultimately making the replication of the method almost impossible to understand or use. This is often the case with many biochemical methods and should not be done. Give the reader the actual methods and/or modifications of methods used.

3. Present methods in the order the measures were obtained so as to recreate the actual flow of the experiment.

4. It is sometimes important to use a flow chart to give an overview of the experimental design and sequence. This will save words as well as help the reader better understand the flow of the experiment. Make sure that any table, flow chart or figure used in the paper can stand alone.

5. Make sure that your subheading on Statistical Analyses is clear and correct. Include your statistical power for your experiment and your P value which you use to define significance (e.g., \( P \leq 0.05 \)). Give the reader a narrative rationale for the statistical approach to your data analysis and justify its approach to the extent needed for clarity.

**Other Features of a Solid Methods Section Include:**

1. Use the appropriate major subheadings of Approach to the Problem, Subjects, Procedures, and Statistical Analyses. Any other headings should be used with care so that the reader is not overwhelmed with a myriad of subheading breaks which interfere with fluent reading style.
2. Make sure there is a logical flow of procedures.
3. Use appropriate system international units (SI units).
4. Tell the reader in the statistical section if you are using standard deviations or standard errors around your mean.
5. Do not present data twice (e.g., in methods and again in results).
6. Descriptive subject data is placed in methods not in the results.
7. Be consistent with all symbols and group names in the paper.
8. Limit the number of acronyms to about five.

Results
The results section is where the paper comes alive. You should make a decision as to which data are the most important and present data in a hierarchical manner with the most important data in Figure Form, the next important data sets in table form and least important data in paragraph form. This will allow the reader to see the major findings of your paper in a clear manner.

Important Points to Consider:
1. Distinguish between results and data related to methods. Dependent variables arising from the experimental design are what constitute results. Descriptive data should be placed in the methods section as it relates to subject characteristics, environmental conditions, etc.
2. Make sure that any data presented arises from the methodological descriptions given in the introduction.
3. Make sure that your data flow reflects your basic methodological flow.
4. Use an opening paragraph to stress and emphasize the most important findings of the investigation and then take the reader though your results.
5. Make sure that you relate or link in some manner the findings to your hypotheses.
6. Check all numbers for accuracy and proper units.
7. Make sure you emphasize the primary findings that you want the reader to remember.
8. Make sure that you formally present each Figure and Table in the results section of the paper.
9. If a result is only an obvious internal control or gives validation to your methods and is not directly related to your hypothesis (e.g., of the effects of
an exercise on some variable, heart rate or lactate production), you can limit its need for direct discussion by stating its utility and meaning in the results (e.g., defining the lactate, RQ, RPE that defined a maximal oxygen consumption test etc.). This will allow only those data which relate to your hypotheses to be addressed in the discussion section and not detract from the focus of the paper yet showing the reader the needed validation for conditions surrounding the testing used.

10. Do not do excessive discussion in the results section—only that which is needed to clarify your data or put in context for understanding it in the reader’s mind. Such statements may include, “As shown many times before, lactate concentrations were elevated after maximal exercise...”, “Supporting the classical findings of many investigations, power output in the second phase of the pull was higher than the first phase...”, “Unique to the literature, we observed...”, “Such findings to our knowledge are the first to demonstrate that...”. Such words allow the reader to see context and novelty.

11. Remember that data are not important just because it is the first time someone has presented it or it has never been shown before. Importance relates to the context of question and hypothesis that has developed in the introduction.

12. Try to make it easy for the reader to remember what is important in the results as they get ready to read the discussion.

13. Continue to examine your paper for symmetrical development with the other sections of the paper in it logic of flow and presentation.

**Discussion**

The discussion section of the paper is where you are given the opportunity to show the paper’s importance, interpret the results and relate it to the hypotheses you set out to test. It is important that you link each paragraph to your results, how it relates to the current literature, its physiological meaning, and its transition to the next finding in your paper.

**Important Points to Consider:**

1. Again, hit home the primary finding in the first paragraph of the discussion section.

2. Do not just report results again!
3. Be consistent with the introduction and results and further underscore and show what and how your findings are novel.

4. Make sure your introduction and question/hypothesis are answered in the discussion section of the paper.

5. Place your findings in the context of the literature as you see it.

6. Make sure you are getting at the real interpretation of your data.

7. Check paragraph flow and logic.

8. Conclude with what might be your final statement of what your research showed and what is still unknown or needs to be investigated in general.

**Practical Applications**

This section is unique to the *Journal of Strength and Conditioning Research* and should present to the coach or practitioner how your data can be used by them. Do not include suggestions for further research etc. as those statements if needed can be placed in the introduction for other scientists to contemplate if not already obvious. This section relates to the actual use of your data. Although not typical of studies published in the journal, if it is a basic study then tell the coach how it sets up further studies which will lead to better practice. Again, it is important to stress how this helps the end user apply what you have found in the context of the area of study that you are examining with your research. It truly provides the information related to the NSCA’s mission of “Bridging the Gap” between the laboratory and the practitioner so it is important to carefully think about what your research says to the end user.