Suggestions for understanding research based articles

When reading a research article, ask the following questions to help you understand the structure and argumentation of the article. If you still cannot understand it, this may be because [1] the author has not communicated his/her ideas clearly, or [2] you simply need more background knowledge of the topic to understand it - not your fault if you’re new to the field.

1. What is/are the main objective(s) of the study?
2. What previous work motivated the study?
3. Does the author state a specific hypothesis or set of hypotheses? If so, what is it / what are they?
4. If a specific hypothesis is not stated, does the author pose a clearly defined research question or questions? If so, what is it / what are they?
5. How does the author test the hypothesis or address the research question? In doing so, does the author identify the following? In your paper, you can usually identify or summarize these research methods in 1-2 or a few sentences, and focus more on the results or findings.
   a) subjects
   b) materials or stimuli used
   c) procedure for collecting the data
   d) methods of data analysis
   e) results
6. Do the results convincingly support the author’s hypothesis? Or do the results adequately address the research question? Explain why or why not.
7. In the author’s opinion, what are the implications of this study? Do the author’s conclusions here seem valid or supported by the data?
8. In your opinion, what are the implications of this study?
9. In your opinion, what are the strengths and weaknesses of this study?
10. Does this article make a good contribution to our/your understanding of the topic?
Understanding statistics in a research article

You may read papers that involve discussion of experiments, statistics and statistical data, including particular statistical procedures (e.g., ANOVAs, chi-square, regression, correlation, t-tests, factor analysis, Cronbach's alpha, and many others). For now, you can skip over all the numerical data and statistical terminology, and focus on the following:

1. Look for the big picture
   It’s important not to get too caught up with individual data points or a tiny section in a really big dataset. Focus on the big picture – the overall purpose of the study, what the researchers were trying to do, whether the data support their hypothesis, and what it means for you as a teacher or consumer of research.

2. No agendas
   This should go without saying, but approach data as objectively as possible. Researchers usually have a hunch about what they are looking for, but they should not let your preconceived ideas influence the results. Likewise, you should have an open mind as well when evaluating others’ research. If you go to length looking for some specific pattern, you’re probably going to find it. It'll just be at the sacrifice of accurate results.

3. Look outside the data
   Three things are important: Context, context, context. The context in which the researchers did their study can affect the results or validity of their findings. Sometimes this will be in the form of other research on the topic, other data, or other studies. The more you know about how the data was collected, where it came from, when it happened, and what was going on at the time, the more informative your results and the more confident you can be about your findings. For example, would the environment in which they did their research affect its validity – would it cause doubts about whether their findings would be valid in other contexts? Would there be problems in applying their findings to your teaching context or research context? What differences between your context and theirs might cause problems for generalizing or applying the findings to your situation?

4. Ask why
   Finally, and this is the most important thing I've learned, always ask why. If a researcher reports some correlation, you should think about whether it makes any sense. If it does make sense, then cool, but if not, dig deeper. Numbers are great, but you have to remember that when humans are involved, errors are always a possibility.

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1 Adapted from http://flowingdata.com/2010/03/04/think-like-a-statistician-without-the-math.
A few important numbers

In regard to the actual numbers, a few are important and worth looking at in the statistical results; we will discuss these more later.

In statistical many tests (ANOVA, MANOVA, t-tests, chi-square, logistic regression, HLM, etc.), the one number that is important is the \( p \) value, referring to probability. In simple terms, one could say that this means the probability that the statistical results are not by chance or not a fluke, in other words, the likelihood that the findings of an effect of X on Y is a strong probability and likely valid, or that the findings of a difference between X and Y are valid. We usually look for a \( p \)-value of \( p \leq .05 \). If it is at .05 or less, then the findings are probably valid statistically.

Some tests look for the degree of a relationship between X and Y, that is, a correlation (or regression analysis). You will see an \( r \) value or a \( \rho \) (Greek letter rho) value, indicating the strength of the correlation or relationship between X and Y. Usually, a correlation of \( r=0.6 \) or \( \rho=0.6 \) or above is rather strong one in social science research; a correlation of 0.4-0.6 is strong, and even in the 0.2-0.4 range is moderate. Some effects under 0.2 could be statistically valid. For correlations, one has to consider whether the relationship makes sense or is meaningful. For example, one might find a statistically valid correlation between the amount of pizza that people eat and their scores on the TOEFL, but it would not be meaningful. One must also remember that correlation does not necessarily mean causation. If X correlates with Y, that does not mean that X causes Y – unless one has other good reasons to believe that X would naturally be a cause of Y.

Occasionally, you may see a Cronbach’s \( \alpha \) (alpha), e.g., to measure how accurately and consistently two raters scored a test, or how consistently students answered a test item. A level of \( \alpha=.8 \) or above would be considered a strong correlation or level of consistency; even somewhat below \( \alpha=.8 \) might be good in some cases.

**Hint for reading experimental papers**

Often for your purposes at present, it is not necessary to read all the statistical details. Often you can skip those sections. Such papers often contain a main section devoted to explaining the experiment and the results. At the end of each experimental section of the paper, there might be a brief subsection called ‘Discussion’, which summarizes the results in less technical or mathematical language. You can focus on this, as well as the introduction to the experimental section to get the main idea of what they did and what they found. Then such papers often have a main section (often called ‘General discussion’) after that, in which they discuss in more general terms the results, what they mean, how they prove or don’t prove their hypothesis, the significance of their results, and their implications. You should focus especially on the main discussion or general discussion section of the paper, and the authors’ further discussion of the significance and implications of their findings. You can then respond to and critique what they say here.

Also, any kind of study, especially in a journal article, might be somewhat broad in scope, or lengthy. In that case, simply focus on the aspects that are relevant to the topic of your paper. Do not try to summarize or critique the whole paper in that case – just focus on the aspects that are important for your own paper.
Writing up a critique of a research article2

Introduction.
1. Begin your paper by describing the specific issue / topic that you are addressing, and maybe why it is important or interested. Do not begin with general statements about the importance of English or good pronunciation skills / grammar skills / etc., or other commonly known information. Start with a specific introduction or background information on a specific topic.
2. Also, cite the authors that you are critiquing. Summarize the main hypothesis or thesis of the paper and explain why you think the information is relevant.
3. State the main point of your paper – your thesis statements, which is the main point or idea of your critique (for shorter assignments such as a homework assignment, this could just be a dry statement to the effect that your paper is critiquing X’s paper; also, this could be combined with #2 or omitted altogether in a short assignment).

Article summary
1. Provide a brief summary of the article, outlining the main points, results, and discussion. Do not provide a full summary; just summarize the most important points that are relevant to your paper, or the most important points of the study. If the article was discussed in class, then keep this as short as possible. For the research methods and study design, you can do this rather succinctly, by simply mentioning the type of research method used, with brief mention of other worthwhile details (“an eye tracking experiment was conducted on Korean college students, who read a short fictional story on a computer screen”). This can often be done in a couple or a few sentences at most – perhaps more for a complex study. The most important thing is to summarize their results / findings and conclusions, focusing on what is most relevant to your term paper (so don’t include unnecessary details).

Your analysis
1. In this section, you should provide your critique of the article. Describe any problems, or particularly noteworthy strengths, that you noticed with the authors premises, research methods, or conclusions.
2. Your critique might focus on problems with the authors argument, presentation, or on information and alternatives that might have been overlooked.

Conclusion
1. Your critique paper should end with an overview of the articles argument, your conclusions, and your reactions. Also, you could discuss implications of the article, e.g., practical implications, pedagogical implications, implications for future research.
2. You could also discuss further questions that the study (or its findings) raise – maybe it addresses some issues, but leads to more questions. If so, what further kinds of research could be done, especially research that would be relevant to your work?

2 Adapted from http://psychology.about.com/od/psychologystudyguides/ht/critiquepaper.htm.
Format

1. Be sure to use APA style format in referring to the article(s) or other sources that you refer to. That is, you cite the source of your paper using only the authors’ last names and year of publication within the text of your paper, e.g., “according to Jones (2005)” or “as one recent study (Jones, 2005) has reported, ...”. The source should be cited at least once in your paper, the first time it is referred to, in this way, to give proper credit to the source. Full bibliographic information goes at the end of your paper in the end references section, with the author (family name first), year, article title, name of journal, volume, and page numbers of the article, e.g.:

References.

2. Avoid use of second person (the pronoun ‘you’, imperative verbs), and use little or no first person (especially ‘I’; occasionally ‘we’ might be okay for some contexts).