Psychology 205: Research Methods in Psychology
Writing the Research Paper
Communication research findings to the broader community

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UNIVERSITY

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Why do it?
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The APA article
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General Style comments
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LaTex
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Bibliographic data bases
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Outline

Writing a research paper: Purpose

1. To add to scientific knowledge
   - as it relates to prior knowledge
   - as it provides new knowledge
2. To convey information clearly and concisely
   - clarity of presentation
   - conciseness of presentation

Why do we bother to teach this style?

1. Because scientific articles are written in a standard style, learning that style helps you, the educated reader, be a better consumer of science.

2. Scientific writing is different from the "five paragraph" essay you might have learned in a history class.

3. If you go on in a scientific career, you will need to write like a scientist.

4. This does not mean being boring, but exciting in an understated way.

Types of articles and representative journals

1. Theory development
   - Psychological Review
   - Psychological Inquiry
   - Brain and Behavioral Sciences
2. Reviews of prior findings
   - Psychological Bulletin
   - American Psychologist
   - Current Directions in Psychological Science
3. "Archival data"
   - peer reviewed studies that are worth publishing
   - because of new findings or methods

Types of journals

1. Broad Band
   - Interest to all fields
     - Science
     - Nature
   - Interest to all psychologists
     - Journal of Experimental Psychology: General
     - Psychological Science
2. Interest to a narrower field
   - Journal of Personality and Social Psychology
   - Journal of Abnormal Psychology
   - Cognitive Psychology
   - Developmental Psychology
3. Methodological
   - Psychological Methods
   - Multivariate Behavioral Research
   - Psychometrika
   - Psychological Assessment
   - Applied Psychological Measurement

Conventional Styles

1. Science/Nature/Psychological Science
   - Emphasis upon problems and conclusions
   - Methods and detailed results last
2. APA journals (and those using APA style)
   - APA manual of style
   - Intro – Method – Results - Discussion – Conclusion
3. Chapters
   - Stand alone content – usually a broad review
   - Integrative structure
4. Books
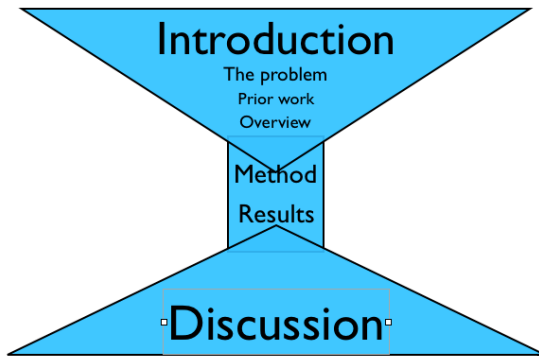   - Edited chapters about a central theme
   - Monograph

Sections of an APA article

1. Title page (separate page)
2. Abstract (separate page)
3. Introduction (but don't say introduction)
4. Method
5. Results
6. Discussion and Conclusion
7. References (Start a new page)
8. Tables (Start a new page for each table)
9. Figure Captions (Start a new page)
10. Figures (Start a new page for each figure)

Structure of a paper is an hourglass

Title page

1. Title
2. Author(s)
3. Affiliation
4. Running Head

See examples in 'Doc Scribe's APA Lite' and in Research Methods Textbook: online text

Abstract

This is the advertisement for your paper. It is perhaps the only
thing people will read. Make them want to read your paper.

1. In less than 100-150 words, tell:
   - What was the problem (broad problem – construct level)
   - What was done (narrow problem – variable level)
   - How many participants
   - Gender of participants
   - What was found (Major results)
   - What does it mean (So what?)

2. (Write the abstract last)

Introduction

1. Theoretical questions being examined
   - Why is it interesting?
   - Why is it important?
2. Review of previous work
   - What has already been found?
   - What unsolved problems are raised by the prior research?
   - Are there methodological flaws in previous research that need to addressed?
3. Overview of study
   - Brief paragraph describing basic design
   - Specific variables of interest
   - How were they measured, what manipulations.

Methods and Procedures

Basically, the recipe of the study, should include the "ingredients" and the instructions.

Enough information to allow someone to replicate the study if they chose to do so

1. Subjects/participants
   - who were they
   - how were they chosen
   - what special characteristics do they have
2. Apparatus and materials
   - any special equipment or forms
   - (think of this as the ingredients being prepared by one research assistant)
3. Procedure
   - what was said by the experimenter
   - what was asked of the participant
   - (Think of this as being conducted by a second research assistant who uses the ingredients prepared by the first RA)

Results

Any finding worth discussing is introduced here

1. say it in words
   - (doing X led to an increase in Y)
2. say it in numbers
   - (mean Y for low X = , mean Y for high X =
3. say it in statistics
   - (Fa,b = xx.xx, p < .0y)
4. This can be combined into one sentence:
   - More words were recalled in the beginning of the list ($\bar{X} = .90$) and end of the list ($\bar{X} = .92$) than in the middle of the list ($\bar{X} = .63$) ($F_{2,23} = 4.85, p < .05$)
   - (note, these numbers are completely fabricated in this example, use real numbers!)
5. References are made to tables and figures.
   - (Insert Table X about here)
   - Actual tables and figures appear at the end of the manuscript

Discussion and Conclusion

1. First paragraph should "wake up grandma". Methods and Results are typically not written in an exciting style. So start off discussion with a punch.
2. What do the results mean?
    - In a manner that a generalist can understand.
    - In a manner that a specialist will appreciate.
3. How do the results relate to the original hypotheses?
    - Why are they different (If they are) ?
4. Implications for further study:
    - What should be the next set of studies to be conducted?
5. Last paragraph gives the "take home message". What is the social importance of your study?

Final sections

1. References
   - literature cited
   - refer to articles actually read by you
   - (if important but not read by you, cite as 'as cited by ')
2. Tables
   - (see our text (chapter 49, p 446- and Plonsky for example tables)
3. Figure Captions (one page for captions for all of the figures)
4. Figures (do not include figure captions on these figures)

General style comments

1. Stylistic considerations
   - General style of writing – facts and theory not fantasy or fiction.
   - Specific requirements are APA style. A relatively standard style across the sciences.
2. Specific, APA style requirements
   - partially meant for the ease of editing
   - margins and spacing
   - levels of headings
   - running heads

General style considerations

1. Overall
   - Write for the intelligent but uninformed reader.
   - Remember what is important in each paragraph and each section.
   - Topic sentences should be able to stand by themselves.
2. Minor comments
   - Use complete sentences.
   - Do not use unnecessary words.
   - Proofread – spelling and punctuation!
   - Remember: tense — data are plural!
3. Writing is easier in small font, narrow margins, single space (this reduces memory load).
4. Final copy needs to be 1 inch margins, double spaced, 10-12 pt. fonts.
5. Proofreading is easier on hard (printed) copy.
6. Read it out loud to your self! (Your ear is better than your eye.)

Special things to consider when writing for scientists

1. Scientific readers are different, they do not read straight through, but rather
   - Abstract
   - First paragraph of intro
   - First paragraph of discussion
   - Last paragraph of discussion
   - Then, and only then the whole paper

2. So, "punch up" those paragraphs to make the shallow reader interested in reading the whole thing.

3. - Read the entire manuscript out loud to see if it sounds right.
   - Try to let the manuscript "breath" – let it rest a bit. Take a break from writing.
   - Don't try to proof read just after writing it.
   - But, proof read it once, then proof it again later.
   - The secret of good writing is rewriting!

Many guides to writing an APA style paper

1. The APA style manual is the official reference, but not so important for a student paper.
2. Emphasize your thinking and writing, style to follow.
3. The On line text (chapter 49) gives an example paper as do several webpages.
4. "Dr. Abel Scribe" has a nice web page on writing a college paper
   - 'Doc Scribe's APA Lite'
5. Also possible to use sophisticated typesetting language LaTeX with the apa6 style sheet
   - Word is fine if you want (and is probably easier).
   - LaTeX is amazing, but difficult at first.

LaTeX: a brief overview – optional

1. Author's emphasis should be upon content not format.
   - let the author write
   - let the computer do the formatting
2. TeX originally developed by Donald Knuth,
   - LaTex by Leslie Lamport as add on to TeX
3. Available as free software from `latex-project.org`
4. For the Mac, I use TexShop but other options are available
5. For making slides, the Beamer set of instructions is a convenient add on to LATEX

LaTex is a markup language

1. LaTeX and HTML (for web) are markup languages and are not WYSYWYG.
2. Initially harder to use than WYSYWYG programs such as Word or OpenOffice.
3. Allow user great control over what the document will look like (if desired) or can do complex formatting without much thought.

LaTeX structure

1. Commands are preceded by \and sometimes followed by {}
    - \section{This is a section heading}
    - %comments are preceded by % and are ignored
2. Structure of a document is
    - Preamble (what packages to include, who you are, what type of output you desire)
    - Content (perhaps broken into sections, perhaps including tables and figures)
    - End materials
3. You can use the same preamble in many documents, just changing the title,

An example LaTeX shell document

```
\documentclass[man]{apa}
      %can be jou (for journal), man (manuscript) or doc (document)
\usepackage{url}
         %this allows us to cite URLs in the text
\usepackage{graphicx}  %allows for graphic to float when doing jou or doc style
\usepackage{amssymb}  %use formatting tools  for math symbols
\title{A basic apa style paper}
\author{Your Name}
\affiliation{Department of Psychology \\ Northwestern University}
%\date{}      % Activate to display a given date or no date
\abstract{Some 100 clever words. What was the problem, sample size, gender.
          What was found, what does it mean.   Use complete sentences. Write ab
\begin{document}
\maketitle
%\section{}   % note in APA style, we do not label the first section
An introduction should be interesting and could include a reference \cite{rev:e
            or two \cite{rm:95}. Everything should be doublespaced!  (
            but in LaTeX you can single space, it will double space for you).
\section{Methods}
Allow someone to do the study again.  What were the materials,
            what was the procedure.
\section{Results}
What did you find -- say it in words, numbers and then stats
  a Table could go here
\section{Discussion}
```

R code

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An example document

A discussion of LaTeX is found as an apa style example (html file).

1. The LaTeX document may be found at the tex file for download
   - It can be downloaded and then compiled into one of three formats:
2. Manuscript mode produces a double space document suitable for review
3. Draft mode is a single-spaced document suitable for writing and reading
4. journal mode looks like it would be published in a journal
5. Different journals actually have different style sheets appropriate for their journal

The first part of the APA example

```
\documentclass[doc]{apa}%can be jou (for journal), man (manuscript) or doc (docu
%
%
%these next packages extend the apa class to allow for including statistical and
\usepackage{url}    %this allows us to cite URLs in the text
\usepackage{graphicx}  %allows for graphic to float when doing jou or doc style
\usepackage{amssymb}  %use formatting tools  for math symbols
% type setting of functions, packages, and R follows a particular style
\let\proglang=\textsf
\newcommand{\R}{\proglang{R}}
\newcommand{\pkg}[1]{{\normalfont\fontseries{b}\selectfont #1}}
\newcommand{\Rfunction}[1]{{\texttt{#1}}}
\newcommand{\fun}[1]{{\texttt{#1}}}
\newcommand{\Robject}[1]{{\texttt{#1}}}
%
%
%Here is where we start the important APA stuff

\title{Example of an APA-style manuscript for Research Methods in Psychology}
\author{William Revelle}
\affiliation{Department of Psychology \\ Northwestern University}
%taken from AP's user notes
% John Vokey uses something like this

\ifapamodeman{%
```

Why do it?
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The APA article
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General Style comments
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LaTex
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Bibliographic data bases
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First page of LaTeX manuscript, set for manuscript version

APA style manuscript   1

Running head: APA STYLE MANUSCRIPT

Example of an APA-style manuscript for Research Methods in Psychology

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William Revelle

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Evanston, Illinois

Third page of LaTeX manuscript, set for manuscript version

APA style manuscript 3

Example of an APA-style manuscript for Research Methods

in Psychology

Writing an APA style paper is an exercise in frustration for most undergraduates taking Research Methods. Besides learning a new language to describe research and how to write in a 'scientific' rather than a 'literary' style, they also are expected to master a very rigid style of formatting the manuscript.

This example article is meant to show three concepts: 1) What an APA paper looks like, 2) How and why to format it in LaTeX, and 3) How to include references using BibTeX. Those who do not want to learn LaTeX, should just look at the format of the paper and the references. For those who want to master the intricacies of an elegant type setting language, you should examine the associated folder available on the class syllabus (`http://personality-project.org/revelle/syllabi/205/apa.style.html`). There you will find three versions of this document: 1) the 'manuscript' or how you should submit a paper, 2) a 'published' version of the paper, or what it would look like in a

Why do it?
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The APA article
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General Style comments
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Bibliographic data bases
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Our APA article, typeset in jou mode

Example of an APA-style manuscript for Research Methods in Psychology

William Revelle
Department of Psychology
Northwestern University

This is an example of a minimal "manuscript" using the LaTeX apa.cls document class to typeset manuscripts according to the Americal Psychological Association (APA) manual, fifth edition. It also takes advantage of the LaTeX apa.cls class. It is modified only slightly from a superb example by Athanassios Protopapas. The abstract should convey five points: 1) why is the problem interesting, 2) what you did, 3) who were the participants, 4) what you found, and 5) what does it mean? All this and be less than 100 words!

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Your paper should basically follow an hour-glass design. A broad beginning and ending with a much narrower methods and results section. The beginning should capture the reader's attention and the conclusion should leave them seeing the broad implications of your study.

Following the hour glass metaphor, your first few paragraphs should be broad enough that someone who knows nothing about the problem will become interested and want to learn more. These first two paragraphs are vital, for if the reader looks at them and is not excited, the rest of the paper will not be read. The next few paragraphs are aimed at the reader who already knows something about the research area and wants to know why this particular paper is worth reading.

This first section of the article is typically the introduction and, according to APA style, should not bear a section heading.[1] Subsequent sections, however, are titled according to the psychological conventions.

After several paragraphs of introduction to your research problem, it is useful to give an overview of the specific questions you are addressing.

It is very important to compare the 'manuscript' version of this document with the final 'journal' view. Using LaTeX we can go back and forth between these two formats with ease. Tables and Figures need to appear at the end of the manuscript version, even though they appear embedded in the middle of the printed version.

Experiment 1

Manuscripts in APA style often contain descriptions of experiments. The APA manual specifies referring to experiments are to use a lowercase "e" when speaking generally, as in the previous phrase, but an uppercase "E" when mentioning a particular experiment (as in the following phrase), such as Experiment 1.

Method

Why do it?
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The APA article
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General Style comments
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LaTex
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Bibliographic data bases
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Our APA article, typeset in doc mode

Example of an APA-style manuscript for Research Methods in Psychology

William Revelle
Department of Psychology
Northwestern University

Abstract

This is an example of a minimal "manuscript" using the LaTeX apa.cls document class to typeset manuscripts according to the Americal Psychological Association (APA) manual, fifth edition. It also takes advantage of the LaTeX apa.cite class. It is modified only slightly from a superb example by Athanassios Protopapas (2007). The abstract should convey five points: 1) why is the problem interesting, 2) what you did, 3) who were the participants, 4) what you found, and 5) what does it mean? All this and be less than 100 words!

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Bibliographic Data bases (optional

1. Although when writing just one paper with a few references, it is easy to keep the references as part of the document, as you write longer papers, it is convenient to have a bibliographic data base.

2. EndNote (available from the NU library) – good for Word

3. BibTex (available from the web) – good for LaTeX in particular

Using BibTeX and Google Scholar

1. Search on Google Scholar for author or critical word
   - Read article (or abstract)
2. Save reference to BibTex/Endnote
3. Include in your paper

Why do it?
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The APA article
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General Style comments
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LaTex
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Bibliographic data bases
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Using Google Scholar for reference searches

📁 My library   ✎ My Citations   👤 My updates   ✉ Alerts   📊 Metrics   ⚙ Settings

Google
scholar

Roediger and McDermott 1995

● Articles (☑ include patents) ○ Case law

My updates: recommended based on My Citations   Learn more

Development and Initial Validation of Military Deployment-Related TBI Quality-of-Life Item Banks.
PA Toyinbo, RD Vanderploeg, AJ Donnell, SA Mutolo… - The Journal of head trauma …, 2014

Structural Equation Modeling With Ωnyx
T von Oertzen, AM Brandmaier, S Tsang - 2014

See all updates

Stand on the shoulders of giants

Why do it?
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The APA article
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General Style comments
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LaTeX
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Bibliographic data bases
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Using Google Scholar for reference searches – part 2

Attempting to avoid illusory memories: Robust false recognition of associates persists under conditions of explicit warnings and immediate testing
KB McDermott, HL Roediger III - Journal of Memory and Language, 1998 - Elsevier
... Abstract. Roediger and McDermott (1995) showed that presentation of associated words can induce false recognition of a related, but nonpresented, associate. In three experiments, we placed this related associate in half of ...
Cited by 220   Related articles   All 7 versions   Import into BibTeX   Save   More

[PDF] from wustl.edu
Find it @ NU

Norms for word lists that create false memories
MA Stadler, HL Roediger, KB McDermott - Memory & cognition, 1999 - Springer
... Roediger and McDermott (1995) induced false recall and false recognition for words that were not presented in lists. ... Roediger and McDermott (1995) designed experiments to study false recall and false recognition that were based on a technique first used by Deese (1959b). ...
Cited by 363   Related articles   All 9 versions   Import into BibTeX   Save   More

[PDF] from wustl.edu
Find it @ NU

Creating false memories: Remembering words not presented in lists.
HL Roediger, KB McDermott - Journal of experimental psychology: ..., 1995 - psycnet.apa.org
Abstract 1. Two experiments (modeled after J. Deese's 1959 study) revealed remarkable levels of false recall and false recognition in a list learning paradigm. In Exp 1, Ss studied lists of 12 words (eg, bed, rest, awake); each list was composed of associates of 1 ...
Cited by 2445   Related articles   All 42 versions   Import into BibTeX   Save   More

[PDF] from umass.edu
Find it @ NU

Tricks of memory
HL Roediger, KB McDermott - Current Directions in ..., 2000 - cdp.sagepub.com
... AN ASSOCIATIVE MEMORY ILLUSION In our first studies (Roediger & McDermott, 1995), we created illu- sory memories by adapting a pro- cedure used by Deese (1959) for other purposes. ... Roediger, HL, & McDermott, KB (1995). ...
Cited by 162   Related articles   All 8 versions   Import into BibTeX   Save   More

[PDF] from wustl.edu
Find it @ NU

[HTML] Neuroanatomical correlates of veridical and illusory recognition memory: Evidence from positron emission tomography
..., E Reiman, T Curran, LS Yun, D Bandy, KB McDermott... - Neuron, 1996 - Elsevier
... the false recognition effect is typically quite small. Roediger and McDermott 1995 have recently described a paradigm for producing a much more robust false recognition effect. Roediger and McDermott revived and modified a ...
Cited by 285   Related articles   All 8 versions   Import into BibTeX   Save   More

[HTML] from sciencedirect.com
Find it @ NU

Factors that determine false recall: A multiple regression analysis
HL Roediger, JM Watson, KB McDermott... - Psychonomic Bulletin & ..., 2001 - Springer
... (Kirkpatrick, 1894, p. 608) Kirkpatrick's informal observations have recently been confirmed by many investigators (eg, Roediger & McDermott, 1995), and false recall and false recognition owing ... Roediger and McDermott's (1995) research built on prior work by Deese (1959b). ...
Cited by 443   Related articles   All 20 versions   Import into BibTeX   Save   More

[PDF] from indiana.edu
Find it @ NU

" Remembering" words not presented in lists: relevance to the current recovered/false memory controversy
JJ Freyd, DH Gleaves - 1996 - psycnet.apa.org
... Roediger and McDermott (1995) reported finding high levels of false recall and false recognition in a list learning paradigm. ... Roediger and McDermott (1995) did specifically address the issue of generalizing to "more spectacular occurrences of false ...
Cited by 106   Related articles   All 10 versions   Import into BibTeX   Save   More

[PDF] from uoregon.edu
Find it @ NU

Import into BibTex

```
@article{roediger1995creating,
  title={Creating false memories: Remembering words not presented in lists.},
  author={Roediger, Henry L and McDermott, Kathleen B},
  journal={Journal of experimental psychology: Learning, Memory, and Cognition},
  volume={21},
  number={4},
  pages={803},
  year={1995},
  publisher={American Psychological Association}
}
```

BibTex and LaTeX

1. The typesetting language LaTeX interacts very well with the bibliographic data base BibTeX.
2. Items may be referenced in LaTeX by \cite{reference}
3. When the text is formatted, this becomes Reference (2010) and the bibliography at the end of the manuscript has the reference in APA form.
4. See the sample manuscript for examples.

Going beyond papers

1. LaTeX also includes the ability to make posters and to do slide shows.
2. The Beamer class extends LaTeX to make slides
   - (see most of my lectures).
3. Can also be used to make Posters for presentations.
   - (See posters in hallway outside the PMC lab).
4. LaTeX is particularly useful when preparing formula rich text for papers and books.

Final comment

1. The content of the paper is most important
2. Structure helps make content flow for reader and writer.
3. Using word processing software should help you write, not hinder it.
4. Some of us feel hindered using commercial software such as Word, others feel liberated.
5. Choose what makes you write best.