How to Write a Research Paper:
General Overview
Dr. K. A. Korb
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Step 1: Conceptualize the Research Study

Determining the research methods before writing on the paper will help the entire paper to be more focused. It would be a shame to spend hours creating a well written Chapters 1 and 2 only to realize that there is no way to actually conduct the research! Furthermore, when you know your research methods, then you can build a stronger argument for the rationale of the study that is necessary in Chapters 1 and 2. Therefore, begin writing your research paper by writing the **Purpose, Null Hypotheses,** and **Research Questions** (if necessary) sections from Chapter 1. Then write your entire Chapter 3. Once these three or four sections are well developed, then you may then write the rest of Chapter 1 and Chapter 2.

Step 2: Write Neatly

If you do not write your paper neatly, your supervisor will have great difficulty making suggestions. Sloppily written papers also frustrate supervisors and frustrated supervisors are not as easy to work with.

Step 3: Avoid using Pronouns

Pronouns such as *it, they, their, her, those,* etc. are very difficult for the reader to interpret. Since pronouns are vague descriptors, readers oftentimes do not know what is being referred to. To be as specific as possible, do not use pronouns. For example, instead of writing "It increases students' achievement," write "Lessons on study skills increase students' achievement." After writing a chapter, read the chapter through once with the specific intention of trying to find every pronoun in the paper. Then change every pronoun to the noun that is being referred to.

Step 4: Avoid using Numbered Lists or Bulleted Points

Research papers are strictly scientific reports and therefore should avoid numbered lists and bulleted points. Both lists and bullets are valid writing styles for textbooks that are intended to teach. However, scientific reports must be written in paragraph form throughout the entire paper. Therefore, convert all numbered lists and bulleted points to a complete paragraph. The only exception to this rule is a list of research questions or hypotheses, which may be written as either numbered lists or bulleted points. Refer to the following example taken from Woolfolk (2007, p. 395).

Motivation to learn is encouraged when students are motivated by the following six elements:

1. Intrinsic motivation, influenced by personal factors such as needs and curiosity.
2. Students choose moderately difficult goals.
3. Task involvement where the student wants to master a task.
4. Motivation to achieve.
5. Attributes successes and failures to controllable effort.
6. Belief that ability can be improved through hard work.

This numbered list should be written in the following paragraph. “Motivation to learn is encouraged when six elements come together. First, students must have intrinsic motivation, which is influenced by personal factors such as needs and curiosity. Students should also choose moderately difficult goals. Task involvement, where the student wants to master a task, is also important to motivation to learn. Students should also have a motivation to achieve and attribute their successes and failures to controllable effort. Finally, students have the best motivation when they believe that their ability can be improved through hard work.”

Step 5: Avoid Plagiarism

Plagiarism is presenting another person’s ideas and words as your own. Plagiarism is completely unacceptable in any form. According to www.plagiarism.org, all of the following are considered plagiarism:

- Turning in someone else’s work as your own
- Copying words or ideas from someone else without giving credit
- Failing to put a quotation in quotation marks
- Giving incorrect information about the source of a quotation
- Changing words but copying the sentence structure of a source without giving credit
- Copying so many words or ideas from a source that it makes up the majority of your work, whether you give credit or not

When using other sources, you *must* paraphrase what is written in your own words and then reference the point by putting the author’s name and date in brackets (Korb, 2008) and then put the complete reference in the *References* section. Avoid using direct quotes unless they are absolutely necessary for making the point. If you include a portion of a work word for word, “You must put the words in quotation marks and then reference the quote by including the page number” (Korb, 2008, p. 3). If you have any questions about whether something is considered plagiarism, please ask.

Step 4: Revision

Writing is not a one-dimensional process. You must reread and revise your paper many times before it will become a high-quality work. As a general rule, each chapter should be revised *at least* one time before submitting it to your supervisor. Partner with another student and make suggestions on each other’s work. Each chapter will be returned multiple times with suggestions. Only the sections with feedback noted by your supervisor have to be completely changed. The sections that the supervisor does not comment on do not need major changes. Continue rereading the sections with no comments for minor wording changes, but you do not need to make substantial changes to these sections. Instead, focus your energy on changing the sections that have comments by your supervisor.

Step 5: Ask Questions

If you do not understand a comment by your supervisor, ask for clarification. Supervisors become extremely frustrated when students’ work does not improve because they do not make the suggested changes. We would much prefer spending the few extra minutes making a point clearer than to read another draft of your paper that makes the exact same mistake that was pointed out in a previous draft.

How to Write a Research Paper:
Chapter 1
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Step 1: Preparation

Write your topic here: _____

Within the topic of your paper, identify your *Independent Variable.* The independent variable is the variable that you manipulate in the study, the cause. The independent variable could be a psychological construct (i.e., self esteem), an environmental condition (i.e., number of books in the classroom), a treatment (i.e., a specific method of teaching), or a group variable (i.e., public vs. private schools; male vs. female).

Write your Independent Variable here: _____

Within the topic of your paper, identify your *Dependent Variable.* The dependent variable is the outcome you are hoping to influence, the effect. Common dependent variables in educational psychology include academic achievement or motivation.

Write your Dependent Variable here: _____

Note: Your independent and dependent variables should both be included in your topic! If they are not, your topic needs to be reframed.

Step 2: Background and Statement of the Problem

There are two main ways that you can structure your *Background* and *Statement*.

Option A

Typically, the *Background* will explain the importance of the dependent variable. First give a brief definition of your dependent variable. Then explain one of two things: 1) Why is the dependent variable important? or 2) Why is the dependent variable in a state of crisis? Then the *Statement of the Problem* will provide the rationale for why you think that your independent variable will influence your dependent variable. For example, in a study examining the effect of motivation on academic achievement, the *Background* would focus on why academic achievement is important or why academic achievement is low. The *Statement of the Problem* would then explain why you think motivation should influence academic achievement.

Option B

A second (but less common) way to write the *Background* and *Statement of Problem* is to spend the *Background* defining and explaining the importance of the independent variable. Then the *Statement of the Problem* provides the rational for why the dependent variable will be influenced by the independent variable. For example, the *Background* could explain the concept of motivation and its importance. The *Statement* would then explain why academic achievement would be influenced by motivation.

Step 3: Purpose, Research Questions, and Research Hypotheses

Each purpose, research question, and research hypothesis should be directly related to how the independent variable influences the dependent variable. A few points to keep in mind:

- There are likely two words used. If the world *effect* is used, that means the study will either be a causal-comparative study (also called ex-post facto) where multiple groups are compared (the independent variable) on the dependent variable, a quasi-experiment (treatment and control groups with pre-existing groups), or an experiment (treatment and control groups with random assignment into the two groups). The other word likely used is *relationship*, which has to be done with a correlational research study.
- When writing the null hypotheses, there are three items to include. First, start the null hypothesis with "There is no significant" and then include either the word *effect* or *relationship*. Second, write "between" and then the two (or more) groups that will be compared. This could be a treatment and control group, demographic groups (i.e. males and females) or if the word *relationship* is used, then include the two variables that will be compared. If studying a *relationship*, then the null hypothesis is complete. If studying an *effect*, then include on what dependent variable.
    - For example, *There is no significant* effect *between* males and females o*n* weight (dependent variable). Or *There is no significant* relationship *between* height and weight.

Step 4: Theoretical Framework

The purpose of the *Theoretical Framework* is to build a case from psychological theory about why the independent variable will influence the dependent variable. In most cases, this section will explain the theory about the dependent variable. Some questions to answer:

- How does your dependent variable develop?
- What influences your dependent variable?

Some (but not many) papers might be more meaningful if the theory about the independent variable is described. In this case, explain the impact the independent variable has on other variables. In both cases, the *Theoretical Framework* should provide a strong theoretical argument for why the independent variable will influence the dependent variable.

Step 5: Significance, Delimitations, and Definition of Terms

The *Significance of the Study* should outline who will benefit from the study. Be sure to explain how and why these people will benefit. *Delimitations* should describe how the study is limited: what variables and what population is the study focusing on? In the *Definition of Terms,* the two most important definitions are the independent and dependent variables.

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The *Literature Review* is perhaps the most difficult section to provide guidance for because each paper's *Literature Review* will be different, depending on the variables under study and the research questions. Make sure that everything included in the *Literature Review* is directly relevant to the variables in your study. Also be certain that your reader has a solid understanding of the major theory that is guiding your work as well as the previous research that has been conducted about your major variables.

Step 1: Create an Outline

The purpose of the *Literature Review* is to make a logical link between past research and your research paper. The *Literature Review* should meet the following objectives:

- Justify your research study – demonstrate that your research is important and is unique from previous studies
- Show how your research study fits with previous research studies
- Highlight flaws in previous research
- Outline gaps in previous research

These objectives can best be met by first making an outline of the major topics that need to be covered in your paper. Focus on your *Independent* and *Dependent Variables.* The *Literature Review* will likely start by going into more detail about the theory that was briefly described in the *Theoretical Framework* of Chapter 1. First describe the main propositions of the theory and then describe research studies that support the theory. Once you have created an outline, then you will know what type of information you need to collect from textbooks and journal articles.

Step 2: Gather Academic Resources

The information that you gather will all be related to building an argument for why your research is important. The following databases should be useful to getting academic resources.

- ERIC: www.eric.ed.gov
- JSTOR: www.jstor.org (This database will only give you full-text articles if you are on a UniJos internet connection.)
- Google Scholar: http://scholar.google.com
- Gutenburg: http://www.gutenberg.org/wiki/Main_Page
- HINARI: http://www.who.int/hinari/en/ Username: NIE014; Passcode: 9592W

When searching for articles, type keywords into the search engine. The best keywords are likely your independent and dependent variables. You can then limit the results that come by many factors – year of publication, full text online, age of participants, location of study, etc.

Step 3: Describe major theories

Your *Literature Review* should provide a good description of the major theory that is guiding your work. Describe the major propositions of the theory. Then you will supplement the theoretical claims by research that supports it (see **Step 4**).

Step 4: Critique Research Articles

After describing the major theories, most of the pages in the *Literature Review* should be focused on reviewing research that has already been conducted in the area of study. Include the following summary of each research study:

- **What** were the **hypotheses** of the study?
- **Who** were the participants in the study? (Include age, nationality, and how many participants there were.)
- **What** were the major **variables** that were examined?
- **How** did the researchers measure their independent and dependent variables?
- **What conclusions** did the researchers come to based on their results?

In addition to summarizing the research, you should also critique the study. Choose at least one of the following areas to critique:

- **Research Design.** How was the research design flawed?
- **Population.** How is the sample insufficient?
- **Methods.** How were the methods in conducting the study flawed?
- **Measurement.** How were the researchers' measures inadequate?
- **Variables.** What other variables may have influenced the results?
- **Assumptions.** Is it possible that the researcher made an assumption that is not valid?

After critiquing the article, state how your research will fill the gap. Perhaps the study was conducted with Americans so you will test the hypothesis with Nigerians. Or the researcher did not include a measure of motivation, but your research study will. Remember, the one of the main purposes of your *Literature Review* is to build a case for why your research study is important. You can best do this by showing where other research studies fall short.

Step 5: Write the Literature Review

After you have made the outline, gathered the resources, and critiqued the research articles you have selected, then you can write your *Literature Review*. Keep in mind the objectives that were stated in **Step 1.** Also stick to the point. Lecturers are busy people and do not want to read more than is directly relevant to your study.

Step 6: Write the Literature Review Summary

At the end of your *Literature Review,* include a summary that briefly describes the major findings based on previous research studies that were reviewed. Then conclude the *Literature Review* with a paragraph or two summarizing the purpose of the research study and how it will fill the gaps created by the previous research.

Step 7: Revise, Revise, Revise

Writing a high quality paper requires many, many revisions. Read your paper over many times with a critical eye. When revising your paper, ask the following questions:

- How can I make this point clearer for my audience?
- Do I use proper grammar and spelling?
- Is this point necessary for the overall purpose of my paper? If the point is not necessary, delete it.
- What points might I be missing that will help my reader understand my argument?

You can also have a peer review the paper. Another person can make a better judgment of portions of the paper that are not understandable to the reader. Note that you should revise **all** chapters in your paper using these guidelines.

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Step 1: Research Design

There are four major types of research designs:

1. **Causal-Comparative** (also called ex-post facto). In this research design, the independent variable is a naturally occurring group variable that has a limited number of groups (i.e. gender, socioeconomic status). The purpose of a causal-comparative study is to examine the differences between groups on the dependent variable.
2. **Experimental**. An experiment has three requirements: 1) at least one (possibly more) treatment group that receives the independent variable manipulation, 2) a control group that does not receive the independent variable manipulation, and 3) random assignment to the treatment and control groups. Most experiments should only administer a post-test. The control group functions as a pre-test. The purpose of an experiment is to determine the effect of the independent variable on the dependent variable. If feasible, an experiment is always preferable to a quasi-experiment.
3. **Quasi-Experimental**. A quasi-experiment is similar to an experiment but only has treatment and control groups; no random assignment. Because there is no random assignment, quasi-experiments must have both pre- and post-tests. The purpose of a quasi-experiment is to determine the effect of the independent variable on the dependent variable when random assignment is not possible.
4. **Correlational**. A correlational study examines the *relationship* between two continuous variables. A continuous variable has a range of possible values (e.g., age, height, weight). The purpose of a correlational study is to quantify the strength and direction of a relationship between two variables.

Choose one research design that most directly aligns with the purposes of the study. Be sure to explicitly identify the independent and dependent variables in this section.

Step 2: Population and Sample

The population of the study is the group of people from which the sample is selected. The sample is the group of people who will actually participate in the study. Be sure to focus the sampling procedure on the actual *pupils, students, or teachers* who are involved in the study. Most studies should only examine one homogeneous group of participants (e.g., only students or only teachers). The sampling procedure should **NOT** explain how the *school* was selected, but how the actual people were selected. The two most common sampling methods are:

1. **Purpositive Sampling**. Most samples are purposefully chosen because they are convenient for the researcher: the researcher has a connection to the teacher or headmaster at a school, the school is geographically close to the researcher, etc.
2. **Stratified Sampling**. In stratified sampling, the researcher identifies a key demographic variable (e.g., age, socio-economic status, type of school, etc.) and then a specified number of participants are selected from within those groups. For example, the researcher might want an equal number of boys and girls in the sample.

For a study to qualify as **random sampling**, all of the people in the population must be selected at random, which is very difficult to achieve. For example, the names of all students in Jos North must be placed in a hat and drawn at random for the sample. Multiple sampling procedures can be applied to one research study. Note the difference between *random*

sampling in which the sample is chosen at random from the population and *random assignment* (a requirement for experiments) in which the participants who have already been selected are randomly assigned to the treatment and control groups. In the *Sample* section, report the key demographic characteristic of the sample: number of participants, age, grade, gender, tribe, language, socioeconomic status, etc.

Step 3: Instruments

Describe in detail the instruments used to measure the dependent variable. Most instruments will consist of a survey or questionnaire. For causal-comparative and correlational studies, you must also describe how you measured your independent variable. Answer the following questions:

- What is the construct that the questionnaire was designed to measure? (Briefly describe your dependent variable.)
- How many items measured the construct?
- How did participants respond? (e.g., Likert scale) How many options?
- Provide a few sample questions
- How was the measure scored? (e.g., averaged responses, added up correct answers)

The easiest and typically the most valid way to measure your dependent variable is by administering a questionnaire that an experienced researcher has previously developed and validated. If using a pre-existing measure, answer the following questions.

- Who developed the measure?
- Who validated the measure?
- What are other studies that have used the same measure?

Step 4: Procedure

The purpose of the *Procedure* section is to describe the study so well that any reader could do the exact same study as you did. Explain exactly when, where, and how the instruments were administered to participants. For experimental and quasi-experimental studies, the *Procedure* section should give a thorough explanation of the treatment. For example: What did the treatment consist of? How long did it last? Where did it take place?

Step 5: Data Analysis

Most studies will use one of the four following statistics:

- t-tests are used when comparing two groups (either demographic groups for causal-comparative studies or treatment and control groups for experiments and quasi-experiments) on the dependent variable.
- ANOVA (Analysis of Variance) when comparing more than two groups on the dependent variable.
- ANCOVA (Analysis of Covariance) when comparing pre- and post-tests for two or more groups.
- Correlation for correlational studies.

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Step 1: Analyze the Data

The validity of your entire research paper stands on the integrity with which you analyze the data. Therefore, be very careful and considerate with all of the data by checking, double checking, and triple checking all results. Even a minor mistake in data analysis can lead to completely faulty results.

First consider how to deal with data that are missing for some participants. The easiest and oftentimes most defensible way to handle missing data is to simply remove that participant from the analysis that requires the missing data. For example, if you have the sex and intrinsic motivation score of the participant but not their achievement scores, remove the participant from the analysis that requires achievement scores. If you had missing data (and practically every research study has missing data), you must report the procedures used to deal with the missing data in either Chapter 3 or Chapter 4.

There are a few options to analyze the data. Microsoft Excel can be used to calculate means, medians, standard deviations, correlations, frequencies, t-tests, and other basic statistics. VassarStats on the internet can be used to calculate many more advanced statistics (http://faculty.vassar.edu/lowry/VassarStats.html).

Step 2: Make Tables or Charts

Charts are particularly valuable for helping readers to visualize the results, so try to find a way to display the major results in a chart. Frequencies can be displayed in histograms. Means and medians can be displayed with either a bar chart or a line chart. use a scatter plot for correlational data. Clearly label charts and tables with appropriate titles. Number charts and tables separately based on the order that they appear in the paper. Reference all tables and charts in the text. For example, “Figure 1 shows boys’ and girls’ mean science achievement.”

Step 3: Report the Data

The most logical way to report data in Chapter 4 is by the research hypotheses listed from Chapter 1. Start the *Results* section by giving a brief paragraph summary of the overall purpose of the research study. Then sub-divide the rest of the *Results* section to report each research hypothesis separately. For example, Section 4.1 can be Research Hypothesis 1. Begin the section by stating the research hypothesis. Then explain how the data was analyzed by stating the statistic used and the independent and dependent variables if relevant. Be sure to interpret the result. For example, “The first research hypothesis examined the effect of gender on science achievement. A t-test was conducted with gender as the independent variable and science achievement as the dependent variable. The t-test resulted in a t-value of 0.23, the degrees of freedom were 119, and the p-value was .93. Since the calculated p-value of .93 was greater than the p-critical value of .05, there was no significant difference between boys and girls on science achievement.”

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Step 1: Summary of Findings

Summarize the results from Chapter 4. What was the main lesson learned from the study? Interpret the statistical results. What do your results mean? All conclusions must be supported by statistics calculated in Chapter 4. For example, "The statistical results from the second research hypothesis demonstrated that older students tend to spend more time studying than younger students." Try to integrate the findings into the results of other research studies. Be sure that the summary focuses only on the analyses in Chapter 4.

Step 2: Recommendations

Give recommendations based on the results of the study. What practical steps can educators take based on the results of the study? Keep the recommendations realistic and focused on the results from Chapter 4.

Step 3: Limitations

All studies have limitations. Focus on the limitations that resulted from the methods described in Chapter 3. How could the research be conducted with a different research method? How were the participants and sampling method limited? How were your instruments inadequate? What problems resulted from the study's procedure? What other unexpected problems arose? All research is limited by money, resources, and time. These are external to the study and should *not* be mentioned.

Step 4: Suggestions for Further Research

Based on the *Summary of Findings* and *Limitations,* what other research should be conducted? What questions arose because of the major finding of your study? How can other research studies improve over the limitations that were described in the *Limitations* section?

Step 5: Conclusions

Briefly summarize the overall conclusion of the research study and its importance.

How to Write a Research Paper:
APA Format
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Part 1: APA Format for Numbers

In general, if the number is nine or less, use the word. If the number is 10 or greater, then use the numeral only. Never use both the numeral and the word. The two major exceptions are that the word is always used if the number is the first word of a sentence. Second, use all numerals if a number 9 or less is in the same sentence as a word 10 or higher. Examples follow. Spell out the number nine. Use the numeral 283. Use figures when both the number 3 and 14 appear in the same sentence. One hundred sixty-five must be spelled since it is the first word in the sentence.

Part 2: APA Format for Acronyms

The first time an acronym appears in your paper, state what the acronym stands for and put the acronym in brackets. Every time the acronym appears afterwards, use the acronym only. For example, "The West Africa Examination Council (WAEC) is a non-profit examination board. WAEC was established in 1951."

Part 3: APA Citation

"Psychologists do not claim the words and ideas of another as their own; they give credit where credit is due…The key element of this principle is that an author does not present the work of another as if it were his or her own work" (APA Manual 5th Edition, p. 349). Further requirements from the APA Manual include giving credit to the source of the text *every time* it is paraphrased and giving credit for ideas such as the design of a research study and the source of a questionnaire that is directly used or adapted.

Most of Chapters 1 and 2 will come from other sources. Paraphrasing others' ideas is perfectly fine and in fact, is required. However, *any* idea that is not your own must be cited from the source where you found it. This includes research studies that are critiqued, theories that are described, statistics that are cited, etc. Paraphrasing means that the idea is put into your own words. Any time another author's words are used, you *must* put the words in quotation marks (see Part 3). Try to avoid using quotations as much as possible as research papers are more convincing when written in the author's own words. Not putting an author's exact words in quotation marks is plagiarism and is unethical and a serious legal offense. Not citing the source of an idea is also plagiarism and is unethical and serious legal offense. Both infractions can result in expulsion from the university.

According to APA, the author(s)' surname and year should be cited for paraphrased material. (For quotes, see Part 3.) For example, the following is found in an educational psychology textbook: "Attention and interest are maintained when teachers are able to make content personally relevant to students and keep them highly involved in learning activities" (p. 420). This can be paraphrased to: Making the course content relevant to students' personal lives keeps students motivated and involved in the classroom (Eggen & Kauchak, 2004). The information is cited by putting the author's surname in brackets, then a comma, and then the year (Surname, Year). Multiple authors are separated by commas and an ampersand sign (Smith, Roger, & Sally, 2003). Full stops are only placed at the end of the brackets (Devonne, 2002). If a paper has three or more authors, cite all authors the first time that the paper is cited. Every other citation afterwards, cite the first author and substitute any following authors with "et al." (Smith et al., 2003). There should be no comma between the first author's surname and "et" but include a full stop after "al." and a comma to separate the authors from the year.

If the author's name is stated in the text, state *only* the surname of the author. Do *not* include the first name, the title of the paper, the journal, etc. Follow the name by the publication year in brackets. For

example, Powel (1998) conducted a research study on intelligence. When using multiple authors in the body of the text, use the word "and" instead of the ampersand. Banks and Middleton (2006) found in their study that…Smith et al. (2003) also found that…

When cited multiple sources for the same idea, put the sources in alphabetical order and separate sources by a semi-colon. Education has a strong influence on intelligence (Akoja, 2008; Bates, 1986; Kalaba, 1993; Sunday, 1973).

Every single source that is cited in the body of the paper must appear in the References section (see Part 4).

Part 4: APA Quotations

Another author's exact words must appear in quotation marks. The citation for a quote is identical to the citation for a paraphrase in every way but also includes the page number. "Direct quotes must be accurate" (Franklin, 2001, p. 118). If the author's name is stated in the body of the text, put the year in brackets after the name and put the page number in brackets at the end of the quote. Franklin (2001) said, "Direct quotes must be accurate" (p. 118).

When the quotation has 40 or more words, do not put the quotation in quotation marks. Instead, indent the entire section ½ inch from the left margin. For example, the APA Manual (2001) gives the following advice on longer quotations:

> Display a quotation of 40 or more words in a freestanding block of typewritten lines, and omit the quotation marks. Start such a *block quotation* on a new line, and indent the block about ½ in. (1.3 cm, or five spaces) from the left margin (in the same position as a new paragraph). If there are additional paragraphs within the quotation, indent the first line of each an additional ½ in. The entire quotation should be double-spaced. (p. 117)

Part 5: APA References

The *References* at the end of the paper *must* include the full reference of all sources that were cited and/or quoted in the paper. Do *not* include any sources that were not cited or quoted in the paper. All references must be listed in alphabetical order. If multiple works by the same author are cited, put in chronological order beginning with the oldest paper. All references should be double spaced. The first line of each reference should be flush-left and subsequent lines are indented ¼ to ½ inch. The following are the APA guidelines for referencing the most common types of resources. Follow these exactly, including the punctuation in the exact same places. If citing a work not listed, please ask. The formatting is in bold here to clarify, but should be typed in plain text.

Journal Article with three authors: **Surname, A. A., Surname, B. B., & Surname, C. C. (Year). Title of article. *Title of Journal, xx,* xxx-xxx.** Spell out the surname, but use initials for all other names. Capitalize the first word in the title of the article but no others (unless they are proper nouns). Do capitalize all major words in the title of the journal. The title of the journal is followed by the volume number. Both the journal title and volume number are italicized. Conclude with the page numbers of the article.

Title of book with one author: **Surname, A. A. (Year). *Title of work.* Location: Publisher.** Capitalize the first word in the book title but no others. Include the city and state of publication as the location.

Dissertations or theses. **Surname, A. A. (Year). *Title of dissertation.* Unpublished doctoral dissertation, University, Location.** Include the words "Unpublished doctoral dissertation" or "Unpublished masters thesis."

Paper presented at a meeting. **Surname, A. (Year, Month).** ***Title of paper.*** **Paper presented at the name of the meeting and association, Location.** Include the words "Paper presented at" followed by the name of the conference.

Chapter with two authors in an edited book: **Surname, A. A., & Surname, B. B. (Year.). Title of chapter. In A. A. Editorsurname, B. B. Editorsurname, & C. C. Editorsurname (Eds.),** ***Title of book*** **(pp. xxx-xxx). Location: Publisher.** The first authors are the authors of the book chapter. The surname of the chapter authors come before the initials. The second authors are the editors of the book. Editors' initials are listed first. The page numbers of the chapters are placed in brackets after the letters "pp."

Online Document: **Author, A. A. (Year).** ***Title of work.*** **Retrieved month day, year, from url.** Type the word "Retrieved" followed by the website address.

The following are examples to clarify each of the preceding types of sources in the same order as listed previously, e.g., Journal Article, Book, Unpublished dissertation, Paper presented at a meeting, Book chapter, Online document.

Briars, D., & Siegler, R. S. (1984). A feature analysis of preschoolers' counting knowledge. *Developmental Psychology, 20,* 607-618.

Carroll, J. B. (1993). *Human cognitive abilities: A survey of factor-analytic studies.* New York: University of Cambridge.

Korb, K. A. (2007). *Verbal versus pictorial representations in the quantitative reasoning abilities of early elementary students.* Unpublished doctoral dissertation, University of Iowa, Iowa City, IA.

Korb, K. A. (2008). *Mental health and exam malpractice: Theory of test design is prediction, not deception.* Paper presented at the annual meeting of the Nigerian Society of Educational Psychologists, Sokoto, Nigeria.

Siegler, R. S., & Robinson, M. (1982). The development of numerical understandings. In H. W. Reese & L. P. Lipsitt (Eds.), *Advances in child development and behavior* (pp. 241-312). New York: Academic Press.

United Nations. (2002). *World Population Aging 1950-2050.* Retrieved April 16, 2008, from http://www.un.org/esa/population/publications/worldageing19502050/index.htm

How to Write a Research Paper:
Developing a Questionnaire*

Dr. K. A. Korb

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"Development of new tests is a complex and difficult process that requires considerable training in educational and psychological measurement. Therefore, we recommend that you make certain no suitable test is available before developing your own" (Gall, Gall, & Borg, 2003, p. 216).

Step 1: Make Absolutely Certain No Other Test Will Work

As Gall and colleagues stated, development of a new questionnaire takes much effort, and oftentimes is a research study in and of itself. Therefore, search the literature to find other research that has studied the same constructs as your study. What measures did they use? Can you get access to that measure? Because they have already been developed and validated, these measures can and should be used for your study except in very unusual situations. You simply have to cite the authors of the original questionnaire in Chapter 3.

Step 2: Define the Construct

Read theoretical papers that describe the variables for the measure ("constructs") in great detail. What exactly is the construct to be measured? Every item on the measure should directly relate to this definition of the construct. For example, *intrinsic motivation* is defined as motivation when an activity is its own reward. Now think about the most direct way to measure the construct. Is a questionnaire the best option, or might it be more directly observed? For example *intrinsic motivation* might be best measured by observing how much time participants spend engaged in the task of interest. The more directly a construct can be measured, the better. Also think about how meaning will be given to test scores. Averaging responses over multiple questions provides the best reliability. Will groups of participants be compared on this construct? How will the groups be defined? Numbers taken from a questionnaire tend to be meaningless unless compared.

Step 3: Define the Target Population

The demographics of the target population can have a large impact on the design of the measure. For example, what is their age, language, literacy, etc.? All questions on the measure should be designed with this population in mind, particularly determining whether the population will be able to understand the words used in the measure. Also think about how the measure will be administered to the population. Where will the measure be taken? How much time will participants have to complete the measure?

Step 4: Review Related Measures

Examine other measures that have been designed to measure similar constructs to determine what type of structure your measure will have. Based on other well-validated measures, you can determine the format (i.e., True/False or Likert Scale, how many options in the Likert Scale), how many items the measure should have, the directions to the participants, etc.

Step 5: Develop a Draft

When developing the draft, pretend that you are a member of the target population. What does the measure need to have to be understandable to a person in the target population? Write clear directions. Give a good explanation of any terms that the participant may not

understand. Clearly label the meaning of the numbers in the Likert scale before any questions are presented. *Every item must directly measure the construct that was defined in Step 2.*

Avoid writing double-barreled questions where a participant may have a different answer to each part of the problem. For example, when trying to determine whether students enjoy attending school, do not write "I do not enjoy going to school because the students pick on me." This is a poor question because students may not enjoy going to school. However, the reason may not be because other students pick on them. Instead, write multiple variations of "I do not enjoy going to school" and the reversed question: "I like going to school."

Write each item in simple language, avoiding psychological terms because most participants, particularly those who have not attended tertiary school, have a very basic knowledge of psychology. Instead of asking participants if they are intrinsically motivated to read, ask questions like "Reading is an enjoyable task for me."

Step 6: Evaluate the Draft

Give the measure to a group of participants similar to your target population. Sit with them as they are taking the measure to determine any problems with the measure. Do they understand the directions? Do they understand the item format? Which questions do they struggle with? Do they complete the test in a suitable amount of time? Do you receive the responses you would expect for each item?

Step 7: Revise the Test

Make the changes that are necessary based on the information that was gathered in Step 6. Then repeat Step 6 with the revised version by giving the measure to a different group of participants similar to your target population. You may need to repeat Steps 6 and 7 multiple times in order to develop a quality measure.

Step 8: Collect Data on Reliability and Validity

Most measures require the split-half reliability calculation (demonstrating that all of the items measure the same construct) for each construct. Rarely will measures require test-retest reliability (the construct is stable over time) or alternate forms reliability (two forms of the test are equivalent). All measures require construct validity to demonstrate that the test does in fact measure the construct that it is purported to measure. Many sources of evidence are required to demonstrate construct validity, including demonstrating that the test scores are not affected by irrelevant variables and that the measure behaves as the theory of the construct predicts. Content validity (sampling the entire domain of the construct) tends to only be relevant to academic achievement tests. Face validity simply determines whether the test *appears* to measure what it is supposed to measure. "The face validity of a test – the mere appearance of validity – is *NOT* an acceptable basis for interpretive inferences from test scores" (Cohen & Swerdlik, 1999, p. 177, emphasis added). In other words, you may NOT use face validity to argue that your test is valid. The best way to establish the validity of a measure is to correlate it with pre-existing measures of a construct. This is why it is best to simply use the pre-existing measure in your research study.

*NOTE: Most of the information from this document is adapted from the following resource: Gall, M. D., Gall, J. P., & Borg, W. R. (2003). *Educational Research: An Introduction* (7th ed.). Boston: Allyn and Bacon.