An Experiment to Investigate the Effect of Reading These Instructions on Student's IA Scores

(Note to students. The title needs to be formatted as I have done above. You should incorporate the method used and your Independent and dependant variables into your title. If the aim of my experiment is to investigate the affect of reading this paper on student's scores, then my IV is students who read this paper vs. students who do not read this paper and the DV is the students score on their IA. Both of these are part of my title)

Put your name here
Candidate # 00560 – XXXX

Group Members

00560-XXXX
00560-XXXX
00560-XXXX

IB Psychology Higher Level
May 2019

Word Count: 1,800 to 2,200 Words
(Note: Put your actual word count here;
Only count from the introduction to the conclusion)

Completed in partial fulfillment of the International Baccalaureate Diploma Program

Some basic rules for this entire IA report:

- You may work in groups of up to four people to gather the raw data, but ***no part of the body of this report may be written as a group.***
- **Each student must write up this report completely independently! Any papers that closely resemble one another will be reported and treated as plagiarism.**
- **The body of your final paper will be turned into turnitin.com!**
- **What you turn into Turnitin.com and what you hand in to me must be exactly the same. If they are not the same you may receive a referral and get a zero for your class grade and IB grade.**
- **If there is any indication that there may be plagiarism or I cannot sign a document stating that this is your own authentic work, then I cannot submit your paper to the IBO. I will report a grade of "0" to the IBO for your IA.**

- In order to get the headings for each section done properly you could do this in 3 separate Word documents, or use section breaks. One for the Title page, abstract and table of contents, one for the body, and one for the appendices.
- It is understood that some of your appendices will be the same as others in your group. Appendices only!
- Your Procedure will be similar to others in your group, but not exactly the same. You must write this independently.
- Everything must be typed up in paragraph form. Only your work for your statistical equations may be hand written. They must go into the appendices. They do not go in the body of this report.
- Do not use bullets or numbered lists. Write everything in paragraph form using complete sentences, except for the procedures and materials. They may be a list.
- ***Write in the past tense, third person***. Refer to yourself as the experimenter and as if you have already completed the experiment. When you turn this in you will have completed it.
- As you turn in each section one at a time, present it to me as if it were your final product. I will grade it as such. You will get one chance for feedback from me. The IBO only allows us to grade it and give feedback once.
- Cite your sources!
- You cannot compare boys versus girls, or old people versus young people, or any other type of quasi-experiment. You must manipulate the independent variable and randomly assign participants to groups. If you can't, then it is not a real experiment.
- Don't lie about your word count, Turnitin.com tells me how many words there are.
- **Read this entire "Instructions for the IB Psychology Internal Assessment" before you start working!**
- **Final IAs must be turned in single sided, Not double sided.**

Table of Contents

(Note: Start your word count here!)

I. Introduction

Read this entire section before you start working!

The Introduction should include background theory and research which logically leads into the research question and hypothesis of your study. This will be one of the longer sections. The APA says that before writing the introduction, consider:

- What is the point of the study?
- How do the hypothesis and the experimental design relate to the problem?
- What are the theoretical implications of the study (how does this study relate to us as humans, or the study of psychology), and how does the study relate to previous work in the area?
- What are the theoretical hypothesis tested, and how were they derived? (APA, 1994)

You must actually read the studies to be able to answer these questions! It seems like common sense but many students try to write their IA without ever having completely read the background studies!

You do not actually write the answers to the above questions in the Intro, they are just to help you understand your study before you start writing.

First Paragraph

Start out broad. Identify the particular aspect of the discipline of psychology in which your study took place. (Example; Cognitive Psychology) Your study, not the study you are replicating. You are introducing your research here. Start with a brief statement about the nature of the general category of psychology that your study falls into. Include a definition if meaningful. Then briefly get more specific. (Example; The study of memory) And then even more specific. (Example; Working Memory) (APA, 1994) This paragraph will be very short.

Second Paragraph

Introduce the Theory. What is the theory and who came up with it? Take some time to develop this well, and present it here as fully but concisely as possible. **If you don't talk about the theory behind the research you will get a zero on this section!** Cite your references properly. Example: (Hanson, 2010) Every researcher cited in your paper needs to be listed in your references. Only list researchers in your references if you cited them. Use good psychological sources, they should be journal articles, but for some studies a book may be used. ***DO NOT use dictionary.com, Wikipedia, any web pages, Etc.*** This could be a short paragraph.

Third Paragraph

Next, talk about the experiment that you are going to replicate. Use only the actual study that you intend to replicate. Assume that the reader is knowledgeable in the field and every little detail does not need to be explained. You must cite your sources and list them on the reference page. When you summarize the study, avoid nonessential details; instead, emphasize pertinent findings, relevant methodological issues, and major conclusions. (APA, 1994) Make the link between this study and your study. State that this is the study you will be replicating. **Cite your**

sources! Do not copy and paste anything! You don't need to be quoting anything. Write everything in your own words.

Fourth Paragraph

Start a new paragraph and state "The aim of this research is to test the theory that ..." If you do not do this, you may receive a 0 out of 6 points on this section!
Explicitly state the theory that you are testing, completely and clearly. Don't just name it, write out what the theory is. Your Aim is **not** to test whether or not this previous research applies to Suncoast students, it should be to test if the theory is true. Do not say that you will prove a theory to be true or to demonstrate the theory, you are investigating the theory. Next you will explain the relevance of the aim. Just state how this knowledge will be helpful in real life. Example, "testing this theory is relevant because we all use our memory every day and it would be helpful to understand how we encode new memories most effectively". This paragraph is just two sentences.

Fifth Paragraph

You must state your Independent and Dependent Variables! They must be clearly and accurately identified, and must be operationalized. There are ***two*** conditions to your I.V., make sure that ***both*** are clearly stated. You should only have one dependent variable and it must be operationally defined and able to be stated as a numerical value. Somebody that is not familiar with your experiment should be able to clearly understand exactly what the I.V. and D.V are.

Last Paragraph

The hypothesis is a statement of the predicted outcome. The independent and dependent variables are clearly stated in the hypothesis. Your hypothesis will be the last thing in your intro. Start a new paragraph for each hypothesis, start each one with either H_1 or H_0, and follow the format below.

For example;
H_1: Participants that receive words in an organized hierarchy will correctly recall a higher number of words when tested than participants that receive the words in an unorganized list.

Notice how this hypothesis includes the two parts of the independent variable, the unorganized list and the organized hierarchy, as well as the dependant variable, will correctly recall a higher number of words. **Yours *must* do the same!**

A null hypothesis is a statement saying that there is no statistically significant difference between the samples tested in the experiment (Coolican, 2004). Researchers try to reject the null within a reasonable margin of error. There is no proof that scientific theories are 100% true. The largest level of acceptable error in the social sciences is 5%. Inferential tests examine if the null can be rejected, not if the research hypothesis is true. The null hypothesis is **not** the opposite of the experimental hypothesis. (Jamison, 2006)

For Example;

Wrong: There will be no difference between the two groups.

Wrong: Participants that receive words in an organized hierarchy will correctly recall a fewer number of words when tested than participants that receive the words in an unorganized list.

Right: H_0: There will be no statistically significant difference between participants that receive words an organized hierarchy and participants that receive the words in an unorganized list on the number of words correctly recalled.

The following examples are how your hypotheses need to be stated and formatted.

Make a new paragraph and format your hypothesis just like this!

H_1: Students that read this carefully will receive a higher number of marks than will students who do not read this paper.
H_0: There will be no statistically significant difference in the number of marks received by students who read this paper and students who do not read this paper.

You must include both the experimental and null hypotheses and format them as I have here, or you will receive a "0" out of six points for this section.

Make sure that all of this is written in the past tense!

You are now done with your Intro. Get out your rubric, (See appendix iii of this paper) and make sure that you have done everything that it says you should have done.

II. Exploration

This section describes in detail how the study was conducted. Such a description enables the reader to evaluate the appropriateness of your methods and the reliability and the validity of your results. It also permits experienced investigators to replicate the study if they so desire. (APA, 1994)

Although I have described what to do here at some length, each one of these paragraphs should be quite short.

First Paragraph

State which type of design was used and explain why. You need to explain why you used the type of design that you used. Don't just say that it was the best choice for your experiment, tell me why this design was used in a way the makes it clear why this was the best choice or ***maybe*** how other designs wouldn't have worked as well. If you do not do this you will get a "0" on this

section. Also, do not explain to me what independent measures or repeated measures are, the IB Graders and I already know *WHAT* they are, we want to know *WHY* you chose this design.

Second Paragraph

You must state your method of sampling and explain the use of this method. Why did you do it this way? You will all use an opportunity sample. The reason why you must use this method is that it is not within your power to randomly sample students from a wide range of classes. Your access to participants is limited to a single class for a limited amount of time and is subject to the desires of the teacher of that class. **Paraphrase this reason!** You may not plagiarize, and this includes this document! You also need to explain how you did your opportunity sample. Explain how you got them, and **how you randomly assigned them to groups**, if you used an independent measures design.

Third Paragraph

You should have between twenty and thirty participants. State the number of participants in each condition or group. State the range of ages and the mean age. Include the number of each gender in each group. You may NOT split the groups up by gender. You can not compare boys versus girls, or old people versus young people, or any other type of quasi-experiment. Give a brief description of your participants. For example, "There were 23 participants. They were from a fifth period SL IB Biology class at a local High School. There were ten boys and thirteen girls. Their ages ranged from 16 to 18." Do not name the school or anyone, including the teacher whose class you used. You must explain why you used the participants that you chose. Despite the fact that you are limited to an opportunity sample and hopefully just one class, you do have a choice of which class you will use. Explain why you chose your participants.

Fourth Paragraph

Explain which variables you controlled. This should be brief, but you should explain how and why you controlled them.

Fifth Paragraph

Now you must list the apparatuses and materials used, and explain why you chose them. An apparatus would be something like a computer, LCD Projector, or lab equipment. Materials would be things like paper, pens, pencils, and other small things that you may be using for your experiment. You might be using one, or the other, or both.

Example;

- Paper with list of words to be memorized (see appendix iv)
- Pencils
- Blank sheets of paper for recall
- Stop watch

Briefly describe these materials. Notice how I referenced the Appendix. Do that for each of your materials. In this section using bullet points is acceptable. You need to explain why you chose these materials.

Sixth Paragraph

Now you are going to lay out your procedure. The point of this is to allow someone to replicate your study if they wanted to. If they are not able to do it exactly the same way you did your study, your study will be found to be unreliable.

This should be a step by step guide how to do your study. If I cannot replicate your study EXACTLY the same way you did it by reading this section, then you have not done your job here. ***In this section using bullet points is acceptable.***

Start your procedure with a description of how you got your sample. Then talk about informing your participants of the nature of the study, asking them if they will participate, and having them sign a consent form. You must inform the students of the nature of your experiment ***before*** you ask them to sign the consent forms. You should mention how you randomly assigned your participants to groups. Then go step by step through your experiment. Most of you will end with analyzing the data that you collected.

You do not need to put your instructions or debriefing in here, that will take up valuable space. Instead, at the appropriate place, you should say something like, "The participants were then read the instructions. (See appendix iv)". Don't forget to include all of the ethical guidelines in your procedure. When your experiment is complete, ask if your participants would like to withdraw their results from the study. Again, reference your debriefing script in the appendices. Ex: (See appendix vii) End your procedure with a brief explanation of how the results were scored and analyzed.

Make sure that this is written in the <u>past</u> tense!

III. Analysis

First Paragraph

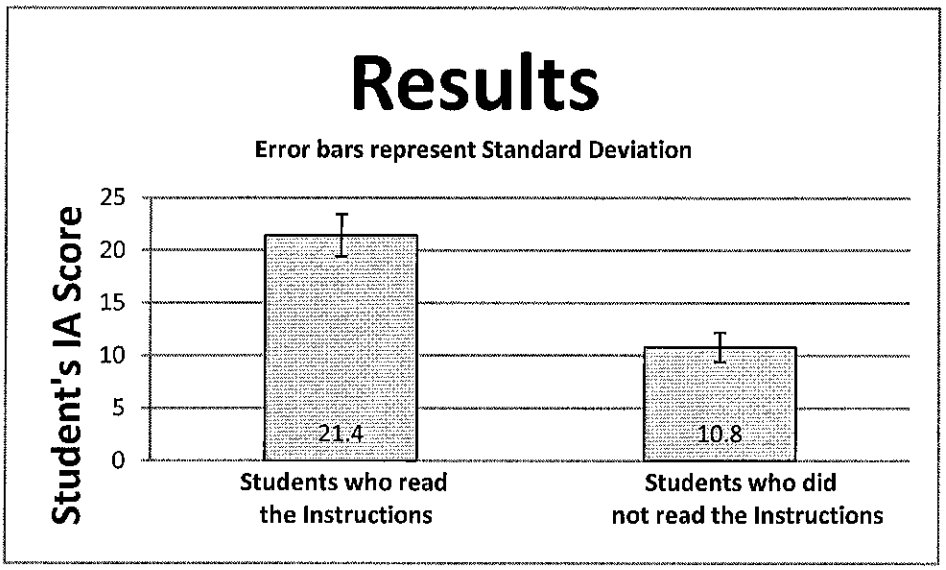
In this section you will have; 1. A paragraph describing your results, 2. A table of your summary data, and 3. A graph. You should state for each group one measure of central tendency, such as the mean or median, and one measure of dispersion, such as the standard deviation or IQR. You should pick only the most appropriate measure of central tendency and dispersion and explain <u>why this one best describes your data</u>. It will most likely be the median. The mean may the best choice if you have interval data and there are no large outliers. If this is true for you, then use the mean and explain this. However, most of you have ordinal data and should use the median and interquartile range. Write a paragraph, do not make a list or use bullets. **Make sure that you report the numbers for each of the two conditions in the body of your description of results.** It is not enough that it is in the graph.

Be sure to label both axes and all other important information in your graph. Explain what all numbers are and what each axis represents. **The labels for your x and y axis must be**

your IV and DV! Do not say group one and group two or any other generic labels. Use the same terms that you used in your Hypothesis!

This is all that you put here. It is a short section. **Do not discuss what these numbers mean here, that goes in the discussion section. <u>Do not put raw data in here!</u>** Raw data, the individual participant's scores, goes in a table in the appendix.

Although you worked in a group, you must each individually type up this entire report. Although you will have the same numbers, everything else should be in your own words.



Your table will also include the most appropriate measure of central tendency and dispersion. You should label it the same as your bar graph. Notice how I state what these numbers are.

	Reading Instructions	Not reading instructions
Mean IA Score		
Standard Deviation		

Second Paragraph

This is where you report the statistical significance of your data. These are inferential statistics. You must do one of the below tests.

Level of Measurement	*Independent Samples*	*Repeated Measures or Matched Pairs*
Nominal	Chi Square	N/A
Ordinal	Mann-Whitney U	Wilcoxon
Interval/Ratio	Unrelated T-test	Related T-test

You must explain why you used the test that you chose. You will decide based on what type of data you have and the design of your study. For example, as can be seen in the above chart, you will use a Mann-Whitney U test if you have ordinal data, which is non-parametric, and your experiment is of an independent samples design. You must state whether the data is parametric or non-parametric. If you decide that you should use a T-Test, then you need to state that your data is parametric. The Mann-Whitney U, Wilcoxon, and Chi Squared are the correct tests for non-parametric data. Also report the critical value, the calculated value and the degrees of freedom if these apply to the test that you are doing. For the Mann-Whitney U test you also need to include whichever is smaller, U_1, or U_2. **Explicitly state your level of measurement, the design of your study, and whether the data is parametric or non-parametric, and state that these reasons are why you chose your test.**

If you think that you should do the T-test, you need to talk with me first. Your data must meet three criteria, and you must explain that it does or you will lose points.

When you perform the test and look up the numbers on the appropriate chart of critical values you will determine if your data is statistically significant. The minimum level of significance that you can have and still claim that your research hypothesis has been supported is "$P < 0.05$". This means that there is less than a 5% probability that your results have occurred by chance. State this in your paper. This is what they mean by a statement of statistical significance.

You must accept or reject your *null* hypothesis. If you are able to reject your null hypothesis, then you may claim that your research hypothesis has been supported. If P is not at least < 0.05, you must accept the possibility that the null hypothesis may be true and you can make no determination as to the validity of your research hypothesis. This is OK. Most students are disappointed if this happens, but you will not lose any points. The purpose of this is to conduct and write up an experiment. You do not have to prove anything. There are no points for creativity or for making some exciting new discovery.

This is also a short section. It will most likely be just one paragraph. All discussion of the importance of your experiment or why it went as it did will go in the next section. Do not include your mathematical work here. You must include that in the appendices. Do ***Not*** include a photocopy of someone else's work! You must do the work by hand, but of course you may use a calculator to help you do the work, but do not run the test on your calculator or a computer. If you do it will be obvious and you will lose points.

There is one other possibility that you may need to consider. There may be a statistically significant difference between the groups, but it may be in the opposite directions that you predicted. In this case, you can still reject the null hypothesis, but you cannot say that your findings demonstrated your hypothesis. Be very clear about this in this section, or you will lose points.

IV. Evaluation

First paragraph

First you should discuss your findings and their relationship to the theory being tested. Did you support the theory with your research? Make sure that you discuss the theory that the original researcher was testing and whether or not your research supports this theory. Do not say that you have supported or proven wrong the theory if you have to accept the null hypothesis.

Next discuss if your findings consistent with the study you replicated. Be specific and name the researcher that you are referring to and briefly state whether your results are similar or different. Do not repeat information in the introduction, but rather link your data to it. Why do you think that your participants performed the way that they did? ***Make sure that you cite the original researchers properly!***

Second paragraph

In the next section of the discussion you should evaluate your methodology and discuss the strengths and limitations of your design, sample, and procedure. **This is where many students lose several points!** Discuss any factors that were out of your control. Consider any confounding variables that might have impacted your results. You may NOT use the commonly mentioned "the sample size was too small to represent the population." This is not an acceptable limitation. The IBO graders have stated that even 10 is a sufficient number of participants and is not a limitation. Do not blame the participant for your problems. If they performed poorly, or did not follow the instructions, or did not understand the instructions, you may mention this, but the problem is that your instructions were not clear enough.

Third paragraph

In your next paragraph you should discuss modifications that you would make if you were to replicate this same study again in the future. How would you fix your limitations? Your modifications should be explicitly linked to your limitations.

Fourth paragraph

Finally, you will have a conclusion. This is not a new section or subsection, and there is no need to label it. It should come at the end of the discussion section. It is very brief. Restate the results of your inferential test, mention if you accepted or rejected your null hypothesis, and clearly indicate the outcome of your investigation.

(The word count stops here.)

(Note: For the References section you should start a new page.)

References

Use the following format. This is APA style. The author's last name always goes first, then the year of publication.

Journal Articles;

Name. (Year). Title of Article. Journal Title. Volume number. Page # - Page #

Books;

Names. (Year). Title of Book. Edition. Place of Publication: Publishers.

You can get more help on APA format at;

http://owl.english.purdue.edu/owl/resource/560/1/

Put your references in alphabetical order!

If you use a web site like EasyBib or NoodleTools you still need to double check the format!

Every researcher cited in your paper needs to be listed in your references. Only list researchers in your references if you cited them in the intro or discussion. There should only be three references! Only the study that you replicated and the two background studies should be used in this IA.

You need to print out and read the full journal articles for your IA.

My References

(These are books, so it looks a little different)

Coolican, H. (2004). *Introduction to Research methods and Statistics in Psychology. (4th ed.).* London: Hodder & Stoughton.

Jamison, J. (2006). *Research Methods in Psychology for High School Students.* New York. iUniverse.

Publication Manual of the APA. (1994). Washington, DC. American Psychological Association.

Content of Appendices

(Note: The appendices are labeled using small case roman numerals.)

** These two Items are included in my appendices for your use.
Do **not** include them in **your** appendices!

Description of Appendices
(This description of appendices is here for me to explain to you what goes in this section. You will not have this page in your paper.)

You will need at least the following items, each on a separate page; Instruction Script, Debriefing Script, Examples of Materials used, a Table of Raw Data, Math Work for Inferential Statistics and most importantly, a sample of your informed consent form. If you used a video, take a screen shot of the important part and include it as an appendix.

Your examples of Materials Used should be exactly what you used in your experiment. Do not place the materials for each of the two conditions on one page if they were not on the same page in your actual experiment. They will likely be two separate appendices.

Do NOT include all of your consent forms. Just include one example of a blank one. You will need to keep all of your signed consent forms and any sheets on which you record your data in case there is ever a suspicion that you did not actually do your experiment and just made the whole thing up. The IBO can ask for this proof at any time up to when your IB diploma is issued, so keep this stuff until then.

Label all of your appendices with small case roman numerals. Example: Appendix i.

Nothing in your appendices is included in your word count, so all of your scripts and other long documents that do not have to be in your report can be placed here and referred to in the appropriate places in your report.

(Note: Informed consent is an integral and required part of the internal assessment process. All candidates must ensure all participants who are 16 years or older sign an informed consent statement. For experiments with participants under the age of 16, parental consent must be obtained.
Candidates should include one blank copy of their informed consent statement as an appendix. Below is a sample consent form that will be modified and used by candidates.)

Sample Participant Informed Consent Form

Put a short description of what your participants are expected to do here. Don't tell them anything that would mess up your experiment, but you can tell them things like they will be watching a video or asked to remember a list of words.

- I have been informed about the nature of the research. (Make sure you do inform them before you ask them to sign this.
- I understand that my participation is voluntary.
- I understand that I have the right to withdraw from the research at any time, and that any information/data about me will remain confidential.
- My anonymity will be protected as my results will not be personally identifiable.
- The research will be conducted so that I will not be demeaned in any way.
- I will be debriefed at the end, and have the opportunity to find out the results at a later date if I wish.

I give my informed consent to participating in this research.

Name (printed): _____

Signature of participant: _____

Signature of parent (If under 16): _____

Date: _____

Note; You may include other statements based on your experiment.

Paraphrase this! DO NOT PLAGERIZE THIS CONSENT FORM!

IB Psychology Internal Assessment Rubric

I. Introduction (6 marks)

0. Does not reach the standard described by the descriptors below.

1–2. The aim of the investigation is stated but its relevance is not identified. The theory or model upon which the student's investigation is based is identified but the description is incomplete or contains errors. Null and/or research hypotheses are stated, but do not correctly identify the Independent or Dependent Variables.

3–4. The aim of the investigation is stated and its relevance is identified but not explained. The theory or model upon which the student's investigation is based is described but the link to the student's investigation is not explained. The Independent and Dependent Variables are correctly stated in the null or research hypotheses, but not operationalized.

5–6. The aim of the investigation is stated and its relevance is explained. The theory or model upon which the student's investigation is based is described and the link to the student's investigation is explained. The Independent and Dependent Variables are stated and operationalized in the null or research hypotheses.

II. Exploration (4 marks)

0. Does not reach the standard described by the descriptors below.

1–2. The research design is described. The sampling technique is described. Characteristics of the participants are described. Controlled variables are described. The materials used are described.

3–4. The research design is explained. The sampling technique is explained. The choice of participants is explained. Controlled variables are explained. The choice of materials is explained.

III. Analysis (6 marks)

0. Does not reach the standard described by the descriptors below.

1–2. Only descriptive or inferential statistics are applied. A correct graphing technique is chosen but the graph does not address the hypothesis. There is no clear statement of findings.

3–4. Appropriate descriptive and inferential statistics are applied but there are errors. The graph addresses the hypothesis but contains errors. The statistical findings are stated but either not interpreted with regard to the data or not linked to the hypothesis

5–6. Descriptive and inferential statistics are appropriately and accurately applied. The graph is correctly presented and addresses the hypothesis. The statistical findings are interpreted with regard to the data and linked to the hypothesis

IV. Evaluation (6 marks)

0. Does not reach the standard described by the descriptors below.

1–2. The findings of the investigation are described without reference to the background theory or model. Strengths and limitations of the design, sample or procedure are stated but are not directly relevant to the hypothesis. One or more modifications are stated.

3–4. The findings of the student's investigation are described with reference to the background theory or model. Strengths and limitations of the design, sample or procedure are stated and described and relevant to the investigation. Modifications are described but not explicitly linked to the limitations of the student's investigation.

5–6. The findings of the student's investigation are discussed with reference to the background theory or model. Strengths and limitations of the design, sample and procedure are stated and explained and relevant to the investigation. Modifications are explicitly linked to the limitations of the student's investigation and fully justified.