

Faculty of Social and Behavioural Sciences  
Department of Education

*Bachelor Programme Educational Sciences*

## **Long-term Assignment Educational Psychology**

Course code: 200300103  
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## Long-term assignment

In the popular televised baking competition “the great British bake off” amateur bakers compete against each other in a series of rounds in which they try to impress a group of judges with their baking skills (or lack thereof). Particularly infamous, is the so called “Technical Challenge”, where the contestants of the show are all given the exact same recipe and, with minimal instruction, have to produce an edible finished product. The end result is often hilariously disastrous and not at all like the original. Clearly, replicating a cake is not as easy as it might seem. In the present course, we will have our own scientific version of the great British bake off. However, instead of baking cakes, we will try to replicate experiments based on the “ingredients” and “recipes” found in the method sections from published articles. In general, scientists are known to be very precise and detailed in describing their procedures and methods. So, how hard could it really be? This assignment should be a piece of cake!

### **Why replication?**

Independent replication of research findings is viewed as a cornerstone in science. Without replication, we can never be confident that findings from the scientific literature are stable, reliable, and robust. Yet, scientists don't seem all too eager to pursue replication projects. They would rather start “exciting” new projects and test novel “sexy” hypotheses, than bother with old stuff like verifying results from previous studies. To illustrate, analyzing the complete publication history of the top 100 education journals, Makel and Plucker (2014) found that only a measly 0.13% of all published articles were replications. A cynic could argue that the so-called cornerstone of replication has eroded to such an extent that what remains is but a pebble for science to rest on. Consequently, in recent years scientists have argued that we are in crisis and that something ought to change. One idea that has been forwarded in the literature (Frank & Saxe, 2012) is to have undergraduate students perform replication experiments as part of their training in experimental methods. This idea has already been successfully implemented in undergraduate courses at other prestigious universities like MIT and Stanford. The present course assignment was loosely based on the Frank and Saxe (2012) article in which they have outlined their own experimental methods course on conducting replication experiments.

### **Assignment objective**

Note that the goal of the assignment is that you get some basic experience with devising and carrying out an experiment, analyzing data, and writing a short research report (including introduction, methods section, results section, discussion section, and reference list). Thus, it will not be necessary to come up with your own research question. However, you still have to distill or reverse engineer the research question from the original research article targeted for replication. Carefully studying the methods section, you will familiarize yourself with the

recipe and all the necessary ingredients for cooking up a great replication experiment. If crucial information in the methods section is missing or unclear, you will have to decide how to proceed. Often this will entail making an estimated guess or changing the procedure of the experiment a bit. This could be the case due to practical constraints (e.g., the amount of time available to run the experiment) that will, in most cases, make a direct (exact) replication of a published experiment unfeasible. Scientifically speaking, your replication attempts will be “conceptual” rather than “direct” replication. You will have the opportunity to discuss some of the difficulties you encounter and decisions you will have to make during the consultation hours. Also, to help you get started we have included a list of frequently asked questions at the end of the assignment outline.

## **Assignment outline**

### **The Aspredicted file**

The assignment is carried out in groups of four students each. Groups are formed during the first tutorial session. One of the first things you will need is a target article for replication. We have compiled a list of studies that we feel are interesting and suitable for replication in an undergraduate course. A study from the list will be randomly assigned to you during the first consultation meeting. You will carefully read the original article and together with your group answer some basic questions about the article. During the first week you will have to write a short one page research proposal. For the research proposal you will answer 8 questions taken from the Aspredicted format (aspredicted.org). The Aspredicted format is used by scientists as a standardized way to preregister planned experiments. By answering 8 short questions, the essentials of the study are laid down in a concise way. You can find a Word document with the 8 questions taken from the Aspredicted file format on Blackboard. Hand in the Word document with all questions answered to your supervisor. You can also find an example of a completed Aspredicted file on Blackboard to get an idea of what is expected from you. You will discuss the Aspredicted Word document for your replication project with your supervisor **during week 38**. It will be the blueprint for your replication experiment. Your supervisor has to approve your Aspredicted document, before you can proceed with your research project (devise the experiment, collect the data, and write the research report).

### **Devising the experiment and writing the research report**

After your Aspredicted document has been approved, you can start with writing the introduction and methods section of your short research report, and at the same time devise/plan the actual experiment. The introduction and methods section should be handed in **during week 39** for peer feedback. Each group will give and receive peer feedback from one other group working on the same replication project. The specifics of the peer feedback (e.g., who will give feedback to whom) will be given prior to the group meeting in week 38. You can find the form for giving (and receiving) peer feedback in Appendix A.

### **Data collection**

For data collection you can use the peer participation system to collect data amongst your fellow students in the course. In return you will participate in other groups' experiments as well. The peer participation takes place during two separate data collection sessions scheduled in the tutorial and/or consultation hours of **week 40 and 41** (with the exception of ALPO students, who will have the entire peer participation session during week 41). During both weeks, you will participate in your fellow students' experiments, and in one of the two weeks you will also be an experimenter and have the opportunity to collect data for your project. Project groups are randomly assigned to either week 40 or 41 for data collection. Each group will have 10-15 minutes to collect data among their fellow students. The schedule for peer participation will be made available on blackboard in due time (prior to the peer participation meetings).

### **Writing the results and discussion section**

After data collection is completed you will finalize your short research report by analyzing and writing up the results, and writing a short discussion section. As with the introduction and methods section, each group will give and receive peer feedback from two other groups on the methods and discussion section. As already noted, you can find the form for giving (and receiving) peer feedback in Appendix A. After some time for revision based on the peer feedback, you will hand in your final research report before Friday 2/11, 17 PM (week 44). Your final research report will be graded by your supervisor using the assessment form in Appendix B. The final research report should be less than 2000 words long (reference list excluded). Also, the final research report should follow the guidelines of the APA 6<sup>th</sup> edition. To help you get started, you can find an example of an APA style template on the Microsoft office website:

<https://templates.office.com/en-US/APA-style-report-6th-edition-TM03982351>

### **Three-slide presentation**

During the final tutorial meeting (**week 43**) you will give a short three-slide group presentation about your replication project. You will create a three-slide PowerPoint presentation (with an introduction, a description of the replication experiment, and the results & conclusion). Also, your fellow students will have the opportunity to ask questions about your research project.

### **Some questions you might have, and answers we might give:**

Q: I have looked over the original research paper that I was assigned, but I think it is very uninteresting and boring. Besides, I have a much better candidate study for a replication attempt. Can I - please, please, please - replicate a study of my own choosing?

*A: Well, we advise you to stick to the article you were assigned. We are on a tight schedule, and due to practical constraints we have already made a selection of articles that we think are interesting and suitable. However, since you asked so nicely, under very special circumstances we will allow you to suggest your own study for a replication. You will have to discuss it with your supervisor first and get his or her approval. Make sure that the study targeted for replication is suitable for replication in the course assignment. Keep in mind the practical constraints that are present in the course when choosing the experiment you want to replicate. It should be feasible to conduct the replication experiment in the allotted amount of time (10-15 min), in the available location (a classroom), and with the convenience sample that is at your disposal (+- 40 of your fellow students).*

Q: I have looked over the research paper that I was assigned, and I think it is very very interesting. In fact, I can hardly wait to start working on the assignment! However, I have a really great idea for adding something new to the replication experiment (like an additional dependent variable). Is this allowed?

*A: Well, since you are so excited, you are of course allowed to add something new to the experiment. Keep in mind that your addition to the experiment should not compromise the integrity of your replication attempt. For instance, if you want to ask participants an additional question, like rating “mental effort” or “motivation”, you can have them do that at the very end of the experiment (instead of at the start). This way, your addition will not affect anything in the original experiment.*

Q: The original experiment targeted for replication is way too long to be run in just 10-15 minutes time. I give up.

*A: Wait a minute, don't give up just yet! Yes, you will only have 10-15 minutes at your disposal to conduct your experiment during the data collection session. Thus, it might be necessary to shorten the original experiment that you are going to replicate. You still use the same ingredients as in the original recipe, but you just change the amounts a bit. For instance, you could choose to change the amount of stimuli or the number of trials used. Furthermore, if an experiment has more than two conditions, then it is highly recommended that you include just two conditions (the critical experimental condition, and the control condition). Leave out all the garnish and side dishes, and simply recreate the main course. Try to be creative and practical and think in terms of solutions rather than problems.*

Q: I don't have the stimulus materials used in the original experiment . I quit.

*A: Wait, wait, wait! Yes, the materials or stimuli used in the original experiment might not be readily available. Still, there are a number of possible solutions to this problem. Sometimes, there are additional materials available online through the publishers website. If this is the case it will often be indicated in the fine print or a footnote of the research article. Secondly, researchers often use stimulus materials that have already been published elsewhere. In that case, you can look up the materials in another previous publication. A third possible solution, is that you send an email to the first author listed on the article and simply ask for the original materials. This will not always have the desired outcome, since researchers are busy people you might not get an instant reply, but at least it is worth a try. If all else fails, you can get creative yourself and replicate the stimulus materials based on the information that is given in the original article.*

Q: The original experiment was run on a computer using software I don't have. I hate you.

*A: Well, first of all, "Hate is just love disguised by jealousy" (Enzo Amore). Secondly, in most cases the experiments targeted for replication will have been conducted using a computer. Of course, this is not a course in computer programming and we do not expect you to program a fully functional experiment (but you are welcome to do so if you have the necessary skills and want to show off). It is perfectly fine for the purpose of the present assignment to present stimuli to the entire group of participants at once using a Powerpoint presentation, or an audio device. Or you could simply create a paper and pencil version of the experiment targeted for replication. Again, try to be creative and practical and think in terms of solutions rather than problems.*

Q: The original research article already has such a well-written introduction and methods section. Can I just copy-paste the text from the original article and be done with it?

*A: NOOOOOO! Importantly, the goal of the assignment is to perform a replication of an experiment, not a replication of an actual research report. In other words, you will have to write the research report in other words (your own!). Do not be tempted to copy-paste sections from the original article, because that is considered plagiarism. Plagiarism is a serious offense that is always reported to the examination board, and could in a worst case scenario result in expulsion from the course.*

Q: Scientists are the people doing all this great and original work, but sometimes some of them can also produce utter garbage. If replication research is really so important, why don't they do it themselves? Why should I be the one cleaning up their mess?

*A: Fair question! Well, whether you want to or not, as a student we also consider you part of the scientific community and we cordially invite you to contribute. There is nothing wrong with*

*doing a little community service, and it will be a great opportunity to learn. But, most importantly, by contributing to the replication movement, scientists might also become less inclined to put out terrible songs like this one: <https://osf.io/j7qp5/>*

*So, go forth and replicate!*

**For planning see next page**

### **References**

Frank, M. C., & Saxe, R. (2012). Teaching replication. *Perspectives on Psychological Science*, 7, 600-604.

Makel, M. C., & Plucker, J. A. (2014). Facts are more important than novelty: Replication in the education sciences. *Educational Researcher*, 43, 304-316.

## Planning long-term assignment

	Tasks
<b>Week 36</b>	No tutorial
<b>Week 37 (week 1)</b>	<p>In the consultation hours: Create small groups, distribute replication studies. In small group: Read and discuss the original study, make a summary by answering the handout questions.</p> <p>Homework: Design replication study and fill in the Aspredicted form. Send the Aspredicted form to your supervisor before Sunday 16/9 23:59 (Tuesday groups) or Tuesday 18/9 23:59 (Thursday groups).</p>
<b>Week 38 (week 2)</b>	<p>In consultation hours: Discuss Aspredicted form with your supervisor. If necessary, make adjustments. Start working on a plan for running the actual experiment.</p> <p>Homework: Write a first draft of the introduction and methods section, and send it to your peer feedback group before Friday 21-09, 17.00 (Tuesday groups) or Monday 24/9 17:00 (Thursday groups). Give/receive peer feedback before Monday 24/9 21:00 (Tuesday groups) or Wednesday 26/9 21:00 (Thursday groups).</p>
<b>Week 39 (week 3)</b>	<p>In consultation hours: Discuss the peer feedback on the introduction and methods section with your peers.</p> <p>Homework: Devise/plan the experiment (create stimulus materials, instructions for participants, and experiment protocol). Rewrite the introduction and methods section based on the peer feedback.</p>
<b>Week 40 (ALPO internship week) (week 4)</b>	<p>Peer participation/data collection session 1.</p> <p>Homework: Perform analysis, start writing up the results and discussion section or (if your data collection is scheduled for next week) devise/plan the experiment (create stimulus materials, instructions, and experiment protocol).</p>
<b>Week 41 (week 5)</b>	<p>Peer participation/data collection session 2.</p> <p>Homework: Write a first draft of the results and discussion section.</p>
<b>Week 42 (week 6)</b>	<p>Consultation hours: Questions about writing results and discussion section.</p> <p>Homework: Finalize the results and discussion section, and send it to your peer feedback group before Friday 19/10 17:00 (Tuesday groups) or Monday 22/10 17:00 (Thursday groups). Give/receive peer feedback before Monday 22/10 21:00 (Tuesday groups) or Wednesday 24/10, 21:00 (Thursday groups). Prepare a short three-slide presentation about your replication project for next week.</p>
<b>Week 43 (week 7)</b>	<p>Tutorial: Short three-slide presentation of your research project and the results/conclusions.</p> <p>Consultation hours: Discuss the peer feedback on the results and discussion section with your peers.</p>

	Homework: Rewrite the results and discussion section based on the peer feedback. Finalize your short research report.
<b>Week 44 (week 8)</b>	<b>Deadline assignment Friday 2/11 at 17:00.</b>

## Appendix A. Peer feedback form long-term assignment

<b>Title of the research report:</b>	
<b>Student names:</b>	
<b>Name peers:</b>	
<b>Date:</b>	
	<b>Aspects</b>
<b>Introduction</b>	<ul style="list-style-type: none"> <li>• The research report contains a clear and concise description of the research question, relevance, methodology, results and conclusions of the original study</li> <li>• The context of the original study is described (the relationship of the original study to other studies in the field)</li> <li>• The theoretical background of the original study is well represented, but not copied</li> <li>• The relevance of doing replication studies in general is described</li> </ul> <p><i>(max 10 points)</i></p>
<b>Feedback</b>	
<b>Methodology</b>	<ul style="list-style-type: none"> <li>• It is clear how the replication study relates to the original study (differences between the original and replication studies are described and well-motivated)</li> <li>• The research design is adequately described (design, participants, instruments, analyses)</li> <li>• Statistical power for the given sample and estimated effect size is calculated and reported</li> </ul> <p><i>(max 10 points)</i></p>

<b>Feedback</b>	
<b>Results</b>	<ul style="list-style-type: none"> <li>• The statistical analysis is appropriate given the research question and research design</li> <li>• The results are clearly and carefully reported</li> </ul> <p><i>(max 10 points)</i></p>
<b>Feedback</b>	
<b>Discussion</b>	<ul style="list-style-type: none"> <li>• The conclusions match the results and provide an answer to the research question</li> <li>• The results of the replication study are discussed in light of the original study</li> <li>• It is discussed whether or not the replication attempt was successful</li> <li>• Possible explanations for the results are discussed</li> <li>• Directions for future research are provided (for instance; ways of improving on the design of the original study)</li> </ul> <p><i>(max 10 points)</i></p>
<b>Feedback</b>	
<b>Quality of the writing</b> <sup>[1]</sup>	<ul style="list-style-type: none"> <li>• The research report has a clear structure (layout and size)</li> <li>• The research report is concise and well written (spelling and style)</li> <li>• All relevant details are presented, but unnecessary details are omitted</li> <li>• There is no unnecessary repetition of information</li> <li>• The research report enables the reader to verify the study (argumentation for choices, completeness of information)</li> <li>• Literature references and reference list are according to APA guidelines</li> </ul> <p><i>(max 10 points)</i></p>
<b>Feedback</b>	

## Appendix B. Assessment form long-term assignment

<b>Title of the research report:</b>		
<b>Student names:</b>		
<b>Name assessor:</b>		
<b>Date:</b>		
<b>Grade:</b>		
	<b>Aspects</b>	<b>Assessment</b>
<b>Introduction</b> <i>(25% of the total grade)</i>	<ul style="list-style-type: none"> <li>• The research report contains a clear and concise description of the research question, relevance, methodology, results and conclusions of the original study</li> <li>• The context of the original study is described (the relationship of the original study to other studies in the field)</li> <li>• The theoretical background of the original study is well represented, but not copied</li> <li>• The relevance of doing replication studies in general is described</li> </ul> <i>(max 10 points)</i>	
<b>Methodology</b> <i>(25% of the total grade)</i>	<ul style="list-style-type: none"> <li>• It is clear how the replication study relates to the original study (differences between the original and replication studies are described and well-motivated)</li> <li>• The research design is adequately described (design, participants, instruments, analyses)</li> <li>• Statistical power for the given sample and estimated effect size is calculated and reported</li> </ul> <i>(max 10 points)</i>	

<p><b>Results</b></p> <p><i>(15% of the total grade)</i></p>	<ul style="list-style-type: none"> <li>• The statistical analysis is appropriate given the research question and research design</li> <li>• The results are clearly and carefully reported</li> </ul> <p><i>(max 10 points)</i></p>	
<p><b>Discussion</b></p> <p><i>(25% of the total grade)</i></p>	<ul style="list-style-type: none"> <li>• The conclusions match the results and provide an answer to the research question</li> <li>• The results of the replication study are discussed in light of the original study</li> <li>• It is discussed whether or not the replication attempt was successful</li> <li>• Possible explanations for the results are discussed</li> <li>• Directions for future research are provided (for instance; ways of improving on the design of the original study)</li> </ul> <p><i>(max 10 points)</i></p>	
<p><b>Quality of the writing</b> [1]</p> <p><i>(10% of the total grade)</i></p>	<ul style="list-style-type: none"> <li>• The research report has a clear structure (layout and size)</li> <li>• The research report is well written and concise (spelling and style)</li> <li>• All relevant details are presented, but unnecessary details are omitted</li> <li>• There is no unnecessary repetition of information</li> <li>• The research report enables the reader to verify the study (argumentation for choices, completeness of information)</li> <li>• Literature references and reference list are according to APA guidelines</li> </ul> <p><i>(max 10 points)</i></p>	
	<p><b>Grade</b></p> <p><i>(.25* points for introduction + .25* points for methodology + .15* points for results + .25* points for discussion + .10* quality of writing)</i></p>	