PS4050 Research Project

School of Psychology & Psychology
2016 – 17
Module Controller: Reiner Sprengelmeyer,
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## Important Information

### Key Hand in Dates

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Dates</th>
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</thead>
<tbody>
<tr>
<td>Submission of Research Report</td>
<td>10(^{th}) April 2017, 17:00</td>
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### Key Feedback Dates

<table>
<thead>
<tr>
<th>Feedback</th>
<th>Dates</th>
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<tbody>
<tr>
<td>Marks for Research Report and Research Performance released. Final grade for module visible on MMS.</td>
<td>26(^{th}) April 2017, 17:00</td>
</tr>
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</table>

### Class times and dates

<table>
<thead>
<tr>
<th>Class/ Event</th>
<th>Date and Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Overview of the Review Essay, followed by a Q&amp;A session on the assignment</td>
<td>2(^{nd}) November 2016 13:00 – 14:00</td>
<td>Psychology Seminar Room</td>
</tr>
<tr>
<td>(Not compulsory for PS4050, but may be helpful)</td>
<td></td>
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<tr>
<td>Overview of the Research Report, Viva and Talk, followed by a Q&amp;A session</td>
<td>29(^{th}) March 2017 13:00 – 14:00</td>
<td>Psychology Old Library</td>
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<td>on the assignments. (Not compulsory for PS4050, but may be helpful)</td>
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### Assessment Summary

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage of Final Grade</th>
<th>Details</th>
</tr>
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<tbody>
<tr>
<td>Research Performance</td>
<td>25%</td>
<td>Supervisor’s report given upon submission of project</td>
</tr>
<tr>
<td>Research Report</td>
<td>75%</td>
<td>6000 word limit which includes everything except figures/ tables and reference list</td>
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Introduction to the module

The Psychology research project (30 credit projects) is a research-based projects in which you perform experiments and collect your own data for analysis. During the course of your project you are expected to complete a series of tasks, and your overall grade for the project depends on your performance in these tasks, as follows:

i. Research performance (25%)

ii. Research report (75%)

You will have been allocated your project at the end of your Junior Honours year. You should arrange an initial meeting with your supervisor, who will discuss the general area with you, and provide a framework for you to formulate a specific question or set of questions to address. You will be given a few research papers or review articles to read to get you started in developing background knowledge in the project area.

The project starts at the beginning of Semester 1 in your Senior Honours year, and lasts for the complete year. Depending on the timetable of your choice of SH specialist taught modules, your project work may be spread evenly over the whole year, or it may be loaded more in one semester than another. You should plan with your supervisor a suitable overall timetable for your project work which takes into account these other commitments. You should also agree when you will meet: this should be on a regular basis.

Your supervisor will provide you with a study notebook or you can keep a computerised lab book/diary of your work. Your supervisor will, where appropriate, cover further costs that are essential to your project. These may include costs such as obtaining articles by inter-library loans, and photography intrinsic to the project, or essential travel costs. They will NOT include the printing costs for your review essay or paper. Discuss possible expenses with your supervisor well before you spend the money to make sure that your supervisor agrees that the cost is affordable and reasonable.

This handbook is a modified version of the Biology BL4201 handbook originally prepared by Professor Pat Willmer, with thanks.

PS4050 Module Organizer:

Dr Reiner Sprengelmeyer (Room 2.68, School of Psychology), rhs3@st-andrews.ac.uk, phone: 46 3049
Skills

Psychology is a topic that involves quite complicated mechanisms and processes. The project module is therefore an excellent vehicle for developing skills in logical thinking and deductive reasoning. You will be given the opportunity to hone your skills in the analysis, interpretation and presentation of data in a manner that informs the readers of the main features of the results and convinces them of the validity of your interpretation. You will utilise both primary and secondary literature to help construct coherent arguments. You will be given the opportunity to reflect upon and learn from feedback, which will benefit your academic progress. As you can see many of the skills that you master early on are built upon as you move through the course assessments. Specific skills that you will gain from each area of the project are summarised below:

Supervisor’s Report (and ongoing guidance)

The supervisors report gives you feedback on your empirical skills and on your ability to work both independently, on your unique research topic, and, if applicable, as part of a team, in a larger research grouping. As you discuss your project with your supervisor and, if applicable, the wider research team you will be encouraged to engage with the views and opinions of others as you refine your research topic. Your supervisor feedback will help to hone your skills in these areas as well as in time management, self-discipline and self-motivation.

Research Report

To prepare the report you will need to apply critical analysis and evaluation to solve complex problems. You will be encouraged to engage directly with current research, developments and skills in the discipline to help you present your findings in the wider context of the field. You will be able to demonstrate quantitative and qualitative methods of analysis, most likely using statistical software packages for recording, manipulation & analysis of data. Your supervisor will guide you on suitable resources for analysing your data. For the report you will convey your research results and methods in a manner understandable to knowledgeable non-specialist.
Ethical Permission for Research

Many research projects will require ethical permission to ensure the highest standards of integrity in research involving humans or animals. Your research report must include an ethical statement. For some students this will be easy as you will be carrying out research under a pre-existing ethical framework that covers all of your supervisors work (e.g. a Home Office Licence for animal experiments). If this applies to your project then you can simply state that this is the case.

For other projects, gaining ethical permission for the work is an integral and important part of your project, which is assessed in your supervisors report (see section on student-led ethics). Before undertaking your project, you should visit the School’s Ethics page and familiarise yourself with the process. The webpage provides helpful step-by-step guidance, as well as tips on how to complete an ethical application; you will also find links to the UTREC application templates.

Human Participation

There are many things to consider when conducting a study that involves human participation, for example:

- Where you will run your study?
- How you will recruit participants?
- How you will pay your participants?

If this is the first time you have conducted your own study, the planning can be a little daunting. However, the School has prepared a guide to help you through this process, which can be found under the ‘Ethics & Project’ section of the School’s Undergraduate webpage: http://www.st-andrews.ac.uk/psychology/current/ug/
Recording your work

It is essential that you keep a record of all of your meetings with your supervisor. There is a computerised document for each student to fill in to enable you to keep up with this. You need only note down the date, duration and a brief description of the meeting but it is essential that you strive to keep this document up to date.

All students must also maintain a record of their work while they undertake their projects. The exact nature of this will vary between projects, but essentially it is a combination of a reflective diary, in which you keep a record of your activities, thoughts and ideas relating to the project, and a laboratory or field notebook in which you record observations or the outcome of experiments, and their analysis. The nature of this record is entirely up to you and your supervisor. It can be a physical notebook or a computerised document recording your activities in PS4050.

The record is a tool that you yourself use as you work on your project. If, when you look at an experimental result, you get an idea for a future experiment, jot it down in your notebook. Then, if in the future you are trying to think what to do next, you can look back through your notebook to see what ideas you have had. Or, when you are writing the Discussion section of your paper, you can get ideas as to how the project could be taken further in the future. Raw data such as computer print-outs etc. can be stapled or taped into a notebook or copied and pasted into a computerised record. You can also have hyper-links to the sources of original data if more appropriate. All of these sorts of details should be discussed with your supervisor. It is imperative that your raw data is accessible to your supervisor and stored in a manner where it is both secure and easy to retrieve. Therefore take great care when labelling electronic files and any physical laboratory or field samples.

The notebook or computerised documentation is also a semi-formal record of what you actually did. If an experiment fails abysmally, so that it yields no results that can be included in your final paper, then the notebook is a record of how you spent your time which proves that the failure was not due to lack of effort. (Although, of course, your supervisor should be fully aware of such situations anyway, and will be advising you on how best to proceed.)

In professional scientific research, the study notebook is also a document that can be used as evidence in disputes such as patent claims, or accusations of plagiarism or fraud. In the context of your Honours project, the notebook is the evidence that you actually did the work that you write about in your project.

The study notebook is not formally assessed as an individual component, but it does feed into the general assessment of Research Performance (see below). You should show your notebook to your supervisor periodically to make sure that you are fulfilling the expectations with regard to note keeping.
Critical information

Research Performance

Your research performance will contribute 25% of your marks for PS4050. Your supervisor will complete this report upon submission of your project.

Introduction to the task

Most of your time during the project will be spent actually carrying out your research, and you will be assessed on your aptitude and application during this period. There is no fixed formula for this, but assessment will take into account factors such as the following:

- Timekeeping and attendance: how hard did you actually work?
- Time management: did you use your time effectively and schedule tasks appropriately according to deadlines and priorities?
- Initiative and planning: did you think about what you were doing, and maybe make suggestions as the project progressed?
- Note keeping: did you keep accurate and clear records?
- Draft of research paper: what was the quality of the draft of the research paper (see below) that you presented for comments?

This is by no means an exhaustive list and the relative importance of these elements will vary between projects, but it should give you an idea of the sorts of things that are assessed under the general heading “Research Performance”.

Guidance

You are expected to discuss the project plan and experimental programme with your supervisor. Your supervisor should organise any training required for the use of specialist apparatus etc., and also keep you informed of any Health and Safety issues (see Appendix four). You can expect to have ready access to assistance with daily routine matters so that trivial problems can be resolved as quickly as possible. You should have regular meetings (at least once a week) on a more formal basis in which your progress and plans are discussed, and in which you receive feedback on any areas where your performance is causing concern. You should show your supervisor your study notebook at some or all of these meetings. You can expect to receive guidance on the analytical methods appropriate for your project, and, as the project progresses, you should present your analysed data at the weekly meetings with your supervisor. These will then be used as the basis for discussion about what to do next. You are likely to receive a higher score in your research performance assessment if you come to these meetings having already thought about what your results mean, and with some ideas about what to do next!
We are committed to giving you the best opportunity to excel at PS4050 but very occasionally there can be issues with your project - first and foremost, don’t panic! All research suffers set-backs at one point or another. Your supervisor is the first port of call: be honest about your concerns. If you experience any problems with your project that you feel are not being adequately addressed by your supervisor you should consult the Module Organiser, your Advisor or the Director of Teaching.

Assessment

Your research performance is assessed by your supervisor. The assessment will be carried out upon submission of your research project and will account for 25% of your final grade. Your study notebook or on-line record forms part of the evidence that will inform that assessment.

A random selection of marks are moderated by the module controller (or another member of academic staff where the module controller is the supervisor). This means that they will look at the comments made by your supervisor and ensure they justify the mark awarded on the 20 point scale. You can see the marking criteria that will be used to assess your work in appendix six.

Feedback

Your feedback will consist of:

- A marking form filled out by your supervisor
- A mark on the 20 point scale
- A feedback session with your supervisor

Your marks will be released via MMS on 26th April, 2017.
Research Report

Critical Information

<table>
<thead>
<tr>
<th>Research Report</th>
<th>10th April 2017, 17:00. Electronically via MMS as a pdf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Due</td>
<td>75%</td>
</tr>
<tr>
<td>Percentage of final grade</td>
<td>There is a 6,000 word limit to this paper, which includes everything except figures, tables and the reference list i.e. figure legends are included.</td>
</tr>
<tr>
<td>Word limit</td>
<td></td>
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</table>

Introduction to the task

The research report is the final written record of your reading, experiments, data analysis and thoughts on your PS4050 project. It is a major undertaking and this is reflected in the heavy weighting given to it in the module assessment. It should be written in the style of a research paper but pitched at the knowledgeable non-specialist. Therefore you should not assume specialist knowledge of your field or techniques and must ensure that these are adequately explained to the reader.

Guidance

Letter

In case of problems with your project, e.g. lack of supervision, lack or breakdown of equipment or organisational problems please talk to your supervisor and/or the module organiser. The letter is a method by which the student can communicate information to the assessors which he/she wants them to be aware of, but which is not included in the report. Scientific issues should usually appear within the report but depending on circumstances you might want to include them here. This should be submitted by email or as a hard copy to the School of Psychology and Psychology office by 10th April, 2017 (email tse3@st-andrews.ac.uk).

Declaration of Authorship

In order for you to receive the credit that is due to you, it is essential that your examiners have a clear understanding of precisely what was your own effort, and what was due to the input of others, before they start to read and assess your paper. The objective of the Declaration of Authorship is for you to provide a brief summary of the routine and non-routine support that you received (from your supervisor, research students, technicians, postdoctoral researchers, etc.) during your project research. Very few aspects of modern science and research are possible without the specialist or general input of assistants and colleagues, and it is only proper that their efforts are duly recognised, acknowledged and distinguished from your own. Of equal importance, however, is the need for you to carefully consider your project in its entirety and to self-assess. In so doing, you will identify for yourself the efforts and inputs of others that have supported you in your project. You should not view the acknowledgement of this assistance as being in any way detrimental to your training,
or your research achievements and the assessment thereof. Please sign this by matric number and not your name to preserve anonymity.

You are requested to compose your own Declaration, which should be of no more than 250 words long. This counts towards the word limit.

**Research Report**

The report should include the following sections:

1. Title page (with word count)
2. Acknowledgements
3. Contents Page
4. Abstract
5. Introduction
6. Materials and Methods
7. Results (or Results and Discussion)
8. Discussion (unless Results and Discussion)
9. References

The text of the paper should form a well-structured “package” that tells a coherent story. This may well mean that not all the experiments/observations that you performed will be included in this final report. However, if you encountered a scientific problem and tried several ways to solve it, and you have the feeling that the experiments are scientifically valuable and/or interesting, we want to read about them even if you were, in the end, not able to solve the problem. But please distinguish between experiments that did not work because you made an error and those where the outcome was not known a priori.

**Excluded material**

It is very likely that not all of the work you do will be included in your final written report. This does NOT mean that you wasted your time on this other material. Experiments that failed through no fault of your own, or experiments that succeeded but which do not fit into the focused theme of the report, will still contribute positively to the assessment of your research performance.

**Format and content of the paper**

By the time you come to write your own research paper, you will have read numerous published original research papers in the same general area as your project. If you are unsure about how to construct figures so that they present your data clearly, or you are not clear about how much information should go into a legend, or you don’t really understand the difference between the contents of the Results section and the Discussion section, you can use these papers as models. You can certainly ask your supervisor for advice on this, but out there in the general literature you have a vast resource of published examples. There is further guidance on preparing research papers on MMS and in appendix one.

The Research Paper is the main documentary evidence of the outcome of your research project, and consequently a significant effort should be allocated to this component of the module. You must submit all of your raw data – lab book and electronic files to MMS by the date of submission.
You should discuss the overall theme, plan and layout of your research paper with your supervisor. You should discuss which sets of experiments should be included or excluded, and you should confirm that you are in agreement as to what the final “take-home message” of the paper should be. Such discussions may well result in the production of mind-maps, bulleted lists, outlines etc.

Your supervisor will provide feedback on one draft of the complete paper except for the Discussion. You should not ask your supervisor or any other member of staff to comment on any draft of the Discussion section of your paper. The draft that you present to your supervisor for comments should be as complete and final as possible (excluding the Discussion). You should endeavour to get your draft report to your supervisor by Friday 31st March, 2017. This deadline is for guidance and it is important that you and your supervisor agree your individual timetable for draft submission.

All papers will be checked for any evidence of plagiarism, and any such evidence could result in disciplinary action (see Appendix three).

**Assessment**

Your research paper will be assessed by two independent markers (i.e. not your supervisor) and these will fall into the category of knowledgeable non-specialists. That is they will have a Psychology background but will not necessarily be a specialist in the topic you present. The two markers will meet with you and ask further questions on your research at your viva (section 8) and then they will agree on a final grade for your work. You can see the marking criteria that will be used to assess your work in appendix six.

**Feedback**

Your feedback will consist of:

- Copies of your research report annotated by each marker
- Individual marking forms from each marker
- An agreed mark and viva form detailing how the final mark was agreed
- A mark on the 20 point scale (influence by the viva grade)

Your marks will be released via MMS on **26th April, 2017 by 5pm**.
Guidance for Supervisors

The following is not an exhaustive list, but it gives some of the key responsibilities of project supervisors.

General guidance

- The supervisor should have an initial meeting with the student to agree working practices, to outline the project and provide suitable initial background reading material or advice. Where projects need (rarely) to be performed during the summer, such contact should be made at the earliest opportunity mutually acceptable for student and supervisor after project allocations have been made.

- The supervisor is directly responsible for strategic aspects of planning, conduct, safety and guidance relating to the project. The supervisor must comply with any relevant risk assessment procedures.

- At the start of the project the supervisor should provide each student with a standard bound study notebook or should agree a format for computerised recording of the work, in which the student records and makes notes about their project planning, results and general progress. The supervisor should give guidance on appropriate record keeping, and periodically review the contents of the study record.

- Early in the project the supervisor should discuss with the student a title for the review essay, and provide an initial set of references. The supervisor should give the student reasonable guidance regarding the depth and breadth of coverage expected in the essay.

- A student may expect to have ready access to assistance with daily routine matters, so that trivial problems can be resolved as quickly as possible. **In addition, there should be regular supervisor-student contact, with a minimum of one discussion meeting per week.** In the event that the supervisor is away for more than a very short period, a stand-in supervisor should be designated, and the Teaching Office informed (in addition to the normal procedures for authorising absence from St Andrews).

- Each student is responsible for the collection and/or analysis of their own data. In projects where students are required to work with pre-existing data sets, they should not co-operate with others in such a way that these collaborations would generate similar sets of derived data.

- The total number of hours that a student should devote to the project should reflect the fact that it accounts for one complete normal semester work load. The proportion of time devoted to the practical and analytical components of the project may vary considerably between projects and is at the discretion of the supervisor. Supervisors should bear in mind that students may well have commitments to taught courses running at the same time as the project, and should manage the project accordingly.
• The supervisor should inform the student of any areas in which his/her performance is deemed unsatisfactory at the earliest possible opportunity.

**Guidance on Assessed Tasks**

• Supervisors should help the students with planning the contents of their review essays, but neither supervisors nor any member of staff should read or comment on any draft versions of this document.

• The supervisor should be prepared to give feedback on the review essay after it has been marked. The aim of this feedback is to help improve the performance of the student in writing the research paper.

• Supervisors should discuss the content and theme of the final research paper with students before they start writing it.

• Supervisors should read and comment on **one draft** of the complete research paper, *excluding the Discussion section*.

• Supervisors should help students to prepare for their viva examination in any way they see fit.

• Supervisors should help students prepare for their presentation, *both by advising on the planning of the presentation, and by offering the opportunity for practice presentations*.

• Supervisors should attend the session in which their students give their presentations, and be prepared to act as assessors, for other students, within that session.
Appendix one: General advice for writing

General Advice for Writing

- Be as concise and clear as possible.
- Write in a formal (but not pompous) style, and avoid colloquialisms.
- Write in the style of an essay, using proper sentences and paragraphs. Make the sense of the text flows, so that ideas follow each other in a logical sequence.
- All abbreviations should be defined in full when first used.
- Presentation matters. Your mark depends in part on the overall quality of the written presentation, including grammar, spelling and layout, and the aesthetic quality of figures.
- If in doubt about a style issue, study a suitable published paper to see how it has been tackled by a professional publisher. Check with your supervisor about which journals to use as models.
- Make sure that every sentence you write makes sense! This means that before you start to write the sentence, you have to be exactly clear in your own mind what it is that you are trying to say. This may sound obvious, but it is surprisingly easy to have a vague and ill-defined thought, that ends up as a vague and nonsensical sentence.
- Proofread your work carefully before submitting it, to eliminate typographical errors.

Figures, Tables and Legends

- Figures and tables provide the evidence that backs up statements made in the main text, but they do not substitute for the text itself. In other words, the main text should make logical sense to the reader without him or her having to actually look at any of the figures or legends.
- All figures and tables must be numbered.
- Maintain separate lists for each (i.e. the first figure is Fig. 1, and the first table is Table 1).
- Maintain one number sequence throughout the piece: do not restart numbers in each chapter or section.
- All figures and tables must be referred to by number in the text.
- Make sure that the numbering of figures and tables reflects their order of appearance in the text.
• Where possible, figures and tables should be placed in-line in the text (rather than on a separate page) near to the place where they are first mentioned.

• All figures and tables should have a legend associated with them. The legend is a short paragraph (maybe a single sentence) which allows the reader to understand what the figure/table shows without reference back to the main text. The legend should include the key to any symbols shown in the figure (unless they are defined as part of the figure itself).

• A set of figures which are closely related (e.g. a series of graphs showing the effects of different concentrations of the same chemical) can be grouped into a single figure, with sub-section labels such as A, B, C etc. You can even have sub-sub-section labels (Ai, Aii, Bi etc) within the single figure.

References

When you give a piece of information, or describe an idea in your thesis, it will either be a result of your own work, or of someone else’s. In the latter case, you need to decide whether you should give a reference for it. Some ideas or information come into the category of “general knowledge”, and these do not need to be referenced. However, others are more specific, novel or detailed, and these should be referenced. If in doubt, reference! The point of referencing is to give credit where it is due (and thus avoid any accusation of plagiarism), and to allow the reader to follow up or verify the information that you give.

Direct quotations should always be referenced AND included in quotation marks or, for longer sections, indented, to give a clear indication of what text is included in the quote. It is NOT sufficient just to give a reference at the end of a section of text which is a direct word-for-word copy from that reference. Also note that simply changing a few words within the text of a quote does NOT remove the need for quotation marks around the rest. If you want to insert some words of your own within a quotation, the standard way is to put them in square brackets; if you want to remove a few words from a quotation, replace them with an ellipsis. Thus “If want to insert some words É within a quotation [to clarify its meaning], the standard way is to put them in square brackets” (ref).

References come in two parts; a citation in the text placed at the point where the information or idea is first presented and a citation in the Reference List at the end of the text where full bibliographic information is delivered. Make sure there are no orphans: all citations in the text should also occur in the reference list, and vice versa.

Psychology degree students should use the APA referencing. Further information on referencing, as well as general advice on writing, can be found at the following link: http://www.st-andrews.ac.uk/media/school-of-psychology/teachingdocs/currentstudents/Report_writing_advice_Honours.pdf
Appendix two: What goes in each section of your research paper

Title
The title should be concise, give an indication about the topic and should not contain abbreviations.

Acknowledgement
Inform in this section about who helped you with what. It is in principle the same as the declaration of authorship but without you signing it with your name to maintain anonymity. It will help the examiners in judging what you actually did by yourself. This includes a clear statement about whether you collected the data by yourself or whether they were given to you.

Abstract
Take particular care with your abstract; everyone will read it first, and first impressions matter! Keep it snappy and informative, giving a well-balanced and accurate summary of the main content of your thesis. It is important to give a clear description of the aims and the hypothesis. You should include a brief statement of the methods, main results and conclusions.

Introduction
Normally, it is advisable to engage the reader’s attention as soon as possible by explaining the problem to be investigated and why it is of interest. Make very clear the hypothesis and the aims of the study. Then move on to describe the historical and/or theoretical background of the subject. State briefly what your methodological approach was (and why, if appropriate). Finally, it is frequent practice to review the most significant result(s) you obtained: the reader is then able to judge the evidence supporting the main findings as they read through the rest of the paper.

Materials and Methods
The concept of repeatability is at the very heart of the scientific method, and the purpose of the Materials and Methods section is to give enough information about the technical aspects of what you did and how you did it to enable another scientist to repeat your experiments in as similar manner as possible.

The Materials paragraph(s) should name any specific chemicals, or biochemical kits etc., that you used; where these are non-standard you must name them accurately, and identify the supplier. Any organisms that you used will be named in full here too, with the proper scientific terminology and authority; and usually any specific sites will be given in the case of fieldwork etc., stating map references. In the case of a Data Analysis project, the Materials section contains full information about the source of the data used.

Methods paragraphs will cover the techniques and protocols that you adopted.

Details of all non-standard techniques that you employed. Where a standard method was used (e.g. protein determination, or ATPase assay, etc.) merely give a reference
in the text, but do indicate precisely what metering equipment was used (make and model). If a method has been modified, give the original reference and spell out your modifications.

Details of protocol. Where the experimental protocol was standard but an essential part of the work you may describe it in brief as well as giving the reference. But do not give a numbered list of steps like a cookery book, as seen in laboratory manuals. Where the protocol was of your own devising describe the method in detail including dates and times of collections and any environmental variables that were measured (again with details of all equipment and suppliers).

Your methods section should also include details of any statistical analysis methods that you apply. This is particularly important for theses based on data analysis, in which the analysis methodology is likely to comprise an important component of the overall project design.

Note: if you design your own analytical methodology and verify it with tests on known data, then you should describe these tests in the opening part of your Results section.

Results

The Results section consists of a body of text, with figures and tables embedded in it. The text should be a cohesive piece of writing that describes the major features of your results, and which can be read on its own without the figures. You can state key numerical findings within the flow of the text, but do not include full numerical details of experimental findings; these should be placed in figures or tables. The figures and tables thus serve as evidence for, and illustrations of, the results described in the text. They enable the reader to verify that the statements of findings within the text are actually substantiated by the experimental data.

In general, you should not attempt detailed explanation or interpretation of the meaning of your findings with the Results section; leave that for the Discussion. However, it can sometimes be difficult to banish all explanations of data from the Results section. The Results may describe a series of experiments, and the purpose of a later experiment can often only be understood in the context of the explanation of the findings of a previous experiment. So one has to use common sense in deciding what level of explanation needs to go into the Results section, and what should be postponed until the Discussion section.

Discussion

The Discussion section is where you round off your paper, explain what your findings mean, and place them in the overall context of the field. You will usually include a summary of your main findings near the start of your Discussion, but you should go well beyond this. When writing your discussion you should think back to the aims that you stated in your introduction, and possibly explicitly (but briefly) re-state them, and then show to what extent your experiments have actually accomplished those aims. You must consider any shortcomings in your data or methodology, and, if possible, argue that these do not detract from your main conclusions. If your data are open to several different interpretations, you should consider these in turn, and then suggest which you think is the most plausible (Occam’s Razor can be a useful instrument, here). You can discuss what further work could be performed to take the
project to a more advanced stage, or to decide between possible alternative interpretations of your data. You can speculate on interpretations of your data that go beyond what you have actually demonstrated, so long as you make it clear that this is indeed speculation. You may want to end of your Discussion with a succinct and pithy statement of how, hopefully, your findings have advanced knowledge in the field of your research.

**Note:** In some subject areas, it is permissible to combine the Results and Discussion sections, especially where the results of one experiment are used to plan the next. Consult your supervisor.
Appendix three: Rules and regulations

Assessment Regulations

- All requests for extensions must go through the School of Psychology & Psychology teaching office https://standrewspsychology.eu.qualtrics.com/jfe/form/SV_cOvbEFUPnpUZK3b

- Academic alerts will be issued for late submission that is not excused http://www.st-andrews.ac.uk/media/teaching-and-learning/policies/Academic%20Alerts.pdf

- Late penalties will be applied at the rate of one grade point per day or part thereof that an assignment is late (Policy A of the Penalties for Late Work http://www.st-andrews.ac.uk/media/teaching-and-learning/policies/penalties.pdf ). This covers the review essay and research report.

- For the project talks, late penalties will be applied at the rate of an initial penalty of 3 points followed by an additional point deducted for each additional 8 hour period of lateness or part thereof (Policy C of the Penalties for Late Work http://www.st-andrews.ac.uk/media/teaching-and-learning/policies/penalties.pdf ).

- Over-length penalties for the review essay and research report will be applied at the rate of 1 mark for work that is over-length to any extent, then a further 1 mark per additional 5% over (Policy C of the Penalties for work of incorrect length http://www.st-andrews.ac.uk/media/teaching-and-learning/policies/penalties.pdf ). Words will be counted electronically and all aspects including text boxes will be counted unless otherwise stated.

- All work will be checked in Urkund for evidence of plagiarism

- Any suspicion or evidence of academic misconduct will be passed to the school academic misconduct officer. For guidance please see the university policy on good academic practice http://www.st-andrews.ac.uk/media/teaching-and-learning/documents/GAP%20Guide%20for%20Students.pdf
Appendix four: Health and Safety

PLEASE inform your supervisor of any special needs, disabilities, or health problems that you have that may affect your safety during the project. It is important that both you and your supervisor are aware of any possible problem to avoid adding to the range of hazards that exist in research work and to avoid creating risks for others. Out-of-hours laboratory work is not normally allowed unless performed under the on-site supervision of a member of academic staff. Under some circumstances, the supervisor may nominate a postdoctoral worker, postgraduate student or technician to provide supervision. In such cases, the nominee should be given a thorough briefing on all aspects of safety relating to the work.

- It is your duty to make sure that you follow the Health and Safety Policy of the School and any Health and Safety instructions given to you by your Academic Supervisor/Laboratory Manager/Laboratory Demonstrator.

- You should be familiar with the contents of the School Health and Safety Policy, especially in so far as they affect your work activity.

You should be aware of the procedures to be used in the event of a fire:

- Where the fire alarms are and how to raise an alarm from an internal phone (9-999).
- Where your escape routes are from the building
- Where the assembly point is.
- The fire alarm will be tested on Friday at 09.00 Psychology Wednesday at 1pm Bute. You do not need to evacuate the building.

You should know what to do in the event of a medical crisis:

- Where the first aid kits are in the school
- Who are the nominated first aiders in the School
- How to call for an ambulance. (from an internal phone 9-999)

- Always ask if you are in any doubt about the Health and Safety policy of the School.

- You must not commence any work activity until the risks, if any, associated with the work activity have been explained to you.

- Accidents, and near accidents that could lead to injury or infection, should be reported immediately to your Academic Supervisor/Laboratory Manager/Laboratory Demonstrator.

- If using the Jeeves Labs, please ensure you familiarise yourself with the code of practice, and that you follow these rules at all time. You will find the Jeeves Code of Practice on the website (Please see chapter on ‘Huma Participation for the link’), and copies are available from the School Office.
• Undergraduates are not permitted into the School out of hours. Therefore, you should ensure that you have completed work/finished with your participant by 5 o’clock. If there is a particular reason why you must test out of normal working hours, you should discuss this with your supervisor who will then liaise with the Head of School.

• Your supervisor should be made aware of when and where you are running participants.

• Please remember, SONA can be used by the public as well as University staff and students. It is therefore not appropriate to use your personal number on this site.

• Always exercise caution when testing participants alone. If you have any concerns, please ensure these are reported to your supervisor.
Appendix five: Marking criteria and sheets

<table>
<thead>
<tr>
<th>Document</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Report Individual Mark Sheet</td>
<td>25</td>
</tr>
<tr>
<td>Research Report Assessment Criteria</td>
<td>26 – 27</td>
</tr>
<tr>
<td>Research Performance Assessment</td>
<td>28</td>
</tr>
<tr>
<td>Research Performance Criteria</td>
<td>29 – 30</td>
</tr>
</tbody>
</table>
## Assessment of Research Report

**Student ID:**

**Marker:**

<table>
<thead>
<tr>
<th>Content</th>
<th>1st</th>
<th>2i</th>
<th>3rd</th>
<th>Ord</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abstract</strong></td>
<td>Concisely identifies key aims and findings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Omits important points, unclear, includes irrelevant material</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Introduction – context</strong></td>
<td>Clear presentation of relevant background</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inadequate background information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Introduction – aims</strong></td>
<td>Aims clearly identified</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Aims not clearly stated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Methods</strong></td>
<td>Clear and concise, sufficient for replication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Confused and disorganised, inadequate for replication</td>
<td></td>
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</tr>
<tr>
<td><strong>Results – rationale</strong></td>
<td>Experimental rationale clearly presented and suitable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rationale not clear or unsuitable</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Figures &amp; Tables</strong></td>
<td>Appropriate to validate key results, suitable legends</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Data presented inadequate/inappropriate to validate findings</td>
<td></td>
<td></td>
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<tr>
<td><strong>Results – analysis</strong></td>
<td>Analysis appropriate and correct</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Inappropriate or inaccurate analysis</td>
<td></td>
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<tr>
<td><strong>Results – conclusions</strong></td>
<td>Valid conclusions drawn from raw data</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Invalid or inadequate conclusions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Discussion</strong></td>
<td>Results placed in context of aims and background</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>Results not placed in context</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Overall style</strong></td>
<td>Clear, concise, focussed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rambling, confused, unfocussed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>References</strong></td>
<td>Appropriate literature cited correctly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Important references missing, format inconsistent or incorrect</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Presentation</strong></td>
<td>Correct spelling, good sentence &amp; paragraph structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spelling and grammar</strong></td>
<td>Many errors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Layout</strong></td>
<td>Visually attractive, well organised, legible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Untidy, badly organised, illegible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Figures &amp; Tables</strong></td>
<td>Neatly drawn/constructed, easily interpreted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Untidy, poorly labelled, interpretation difficult</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Specific comments and justification for mark awarded (continue over if needed):
<table>
<thead>
<tr>
<th>Assessment Area</th>
<th>1st</th>
<th>2i</th>
<th>2ii</th>
<th>3rd Class</th>
<th>Ord</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>Engaging and exciting, concisely identifies key aims/ hypotheses and findings and places them in a wider context</td>
<td>Good but lacks flair to engage the reader and highlight the importance of the project</td>
<td>Lacks impact, covers key findings with little context</td>
<td>Incomplete or unclear with some irrelevant material but does present a few key points</td>
<td>Missing. Omits important points, is unclear or contains irrelevant material</td>
</tr>
<tr>
<td>Introduction - context</td>
<td>Relevance of gap in knowledge to theory described using only relevant details giving a clear and unambiguous background to the topic</td>
<td>Contextual detail and gap in current knowledge given, theoretical framework described</td>
<td>Contextual detail given; theoretical framework stated but not described. Insufficient depth to give a full understanding of the field of study</td>
<td>Work placed in context, but with missing/erroneous theoretical framework giving limited background to the project</td>
<td>Worked not placed in context, little or no evidence of understanding of the field, inadequate background information</td>
</tr>
<tr>
<td>Introduction – aims/ hypotheses</td>
<td>Aims/ hypotheses related to broader context</td>
<td>Aims/ hypotheses clearly stated</td>
<td>Aims/ hypotheses stated but could be clearer, more precise</td>
<td>Aims/ hypotheses poorly described, some omissions</td>
<td>Aims/ hypotheses not stated</td>
</tr>
<tr>
<td>Methods</td>
<td>Design justified and complete. Clear &amp; detailed participant information, easily replicable procedure, detailed, appropriate and well justified analysis section</td>
<td>Detailed design but not throughout, full participant information, procedure replicable, detailed &amp; appropriate analysis section</td>
<td>Design present but not justified, participant info present, but some details missing/unclear, procedure basic, appropriate analysis</td>
<td>Design incomplete, missing / rudimentary participant information, procedure without details, analysis section missing / incomplete</td>
<td>Few details, insufficient for replication, no details of data analysis procedures</td>
</tr>
<tr>
<td>Content of figures &amp; tables</td>
<td>Excellent data presentation, appropriate to validate key results. Clear concise and detailed figure legends</td>
<td>Very good attempt at data presentation. Clear rationale behind the choice of data to present. Good quality legends with all important information clearly presented</td>
<td>Good attempt at data presentation but some drawbacks with choice of data to be presented, legends sufficient but lacking some important information</td>
<td>Data presented adequate, omission of some key data that would help validate conclusions, legends brief</td>
<td>Data presented inadequate/ inappropriate to validate findings, poor/ no legends</td>
</tr>
<tr>
<td>Results - analysis</td>
<td>Excellent attempt at analysis and interpretation with very little/ no errors</td>
<td>Very good attempt at analysis and interpretation with few errors</td>
<td>Good attempt at analysis and interpretation with some errors</td>
<td>Analysis and interpretation limited with a large number of errors</td>
<td>Little/ no data analysis undertaken</td>
</tr>
<tr>
<td>Results - conclusions</td>
<td>Valid, accurate conclusions drawn from the data</td>
<td>Good clear conclusions drawn from the data</td>
<td>Valid conclusions presented, some may not be fully supported by the data presented</td>
<td>Invalid or limited conclusions not supported by the data</td>
<td>Invalid or absent conclusions presented</td>
</tr>
<tr>
<td>Discussion</td>
<td>Results placed in context of the aims/ hypotheses excellent evidence of understanding where the</td>
<td>Results placed in context of the aims/ hypotheses, clear evidence of understanding where the</td>
<td>Results placed in context of the aims/ hypotheses, some evidence of understanding where the</td>
<td>Results placed in context of the aims/ hypotheses but with limited evidence of understanding where</td>
<td>Little/ no discussion of the results within the context of the field</td>
</tr>
<tr>
<td>Overall style</td>
<td>Clear, concise and focussed. Stylistically appropriate for publication</td>
<td>Well written with a clear focus on the project. Little/ no evidence of colloquialism.</td>
<td>Generally well written but tendency towards colloquialisms, some lack of focus/ rambling</td>
<td>Poorly written with some confusion and tendency towards colloquialisms, poorly focused/ may ramble in places</td>
<td>Rambling, confused and/ or unfocused</td>
</tr>
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</tr>
<tr>
<td>References</td>
<td>Thorough and proper referencing throughout</td>
<td>Referencing accurate, though some stylistic errors in the reference list</td>
<td>Reference list broadly comprehensive, but frequent failure to use appropriate style in citing references</td>
<td>Frequent errors both in the content and style of references</td>
<td>Minimal and generally inaccurate use of referencing, missing references and referencing of material not cited in the text</td>
</tr>
<tr>
<td>Spelling and Grammar</td>
<td>Correct spelling, excellent sentence and paragraph structure throughout. Clear evidence of careful proof-reading.</td>
<td>Good spelling, sentence and paragraph structure throughout.</td>
<td>Some spelling/ grammatical errors</td>
<td>A large number of typographical errors, poor sentence/ paragraph structure, poor grammar</td>
<td>Many errors –both spelling and grammatical no evidence of proof-reading.</td>
</tr>
<tr>
<td>Layout</td>
<td>Visually attractive, well organised with a clear structure and excellent use of sub-headings, figures and diagrams.</td>
<td>Mostly well organised with a clear structure and visually pleasing</td>
<td>Adequate structure and organisation. Untidy in places</td>
<td>Poorly organised and lacking in a clear defined structure</td>
<td>Untidy, badly organised and illegible in places</td>
</tr>
<tr>
<td>Presentation of figures &amp; Tables</td>
<td>Very well constructed figures/ tables throughout, easily interpreted and of publication standard</td>
<td>Generally well constructed figures/ tables, easy to interpret data from them</td>
<td>Good construction but some important details omitted, size inappropriate for resolution of detail</td>
<td>Poor construction, lack of attention to detail, too small/ large for appropriate presentation of the data</td>
<td>Untidy, poorly constructed, interpretation difficult</td>
</tr>
</tbody>
</table>
### PS4299/ PS4050: Assessment of Research Performance

**Title:**

<table>
<thead>
<tr>
<th>Experimental work</th>
<th>1st</th>
<th>2i</th>
<th>2ii</th>
<th>3rd</th>
<th>Ord</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motivation, attendance</strong></td>
<td>Keen, eager to learn, regular attendance</td>
<td></td>
<td></td>
<td></td>
<td>Lacked interest, poor attendance</td>
</tr>
<tr>
<td><strong>Time management</strong></td>
<td>Effective time management</td>
<td></td>
<td></td>
<td></td>
<td>Poor time management, disorganized</td>
</tr>
<tr>
<td><strong>Planning, design</strong></td>
<td>Made important contribution to planning and design</td>
<td></td>
<td></td>
<td>Relied on supervisor for all planning and design</td>
<td></td>
</tr>
<tr>
<td><strong>Technical ability</strong></td>
<td>Showed good research skills</td>
<td></td>
<td></td>
<td>Poor skills</td>
<td></td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td>Analysed data and interpreted results correctly</td>
<td></td>
<td></td>
<td>Analysis and interpretation needed frequent correction</td>
<td></td>
</tr>
<tr>
<td><strong>Independence/innovation</strong></td>
<td>Able to design and modify own experiments where appropriate, and have ideas about what to do next</td>
<td></td>
<td></td>
<td>Very little ability to innovate or think independently, disappointing</td>
<td></td>
</tr>
<tr>
<td><strong>Experimental record keeping</strong></td>
<td>Clear, legible, easy to follow</td>
<td></td>
<td></td>
<td>Disorganized, illegible</td>
<td></td>
</tr>
<tr>
<td><strong>Ethical application (if appropriate)</strong></td>
<td>Smooth process led by the student with full understanding of issues</td>
<td></td>
<td></td>
<td>Supervisor leading process with little of the required input from the student</td>
<td></td>
</tr>
<tr>
<td><strong>Draft report</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Draft report</strong>*</td>
<td>Clear and complete, and submitted on time such that nuanced and more advanced feedback could be given</td>
<td>Poor and disorganised (or late submission without good reason), such that extensive and fundamental suggestions for improvement were needed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Feedback on your draft does not reflect the grade your supervisor expects the final report to get. Rather it reflects your performance in writing a draft

Specific comments and justification for mark awarded (continue over if needed):
<table>
<thead>
<tr>
<th>Assessment Area</th>
<th>1st</th>
<th>2i</th>
<th>2ii</th>
<th>3rd Class</th>
<th>Ord</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motivation and attendance</strong></td>
<td>Excellent attendance, eager to learn and engage in all aspects of the project, well prepared for all meetings</td>
<td>Very good attendance with good enthusiasm for most aspects of the project, mostly well prepared for supervisor meetings</td>
<td>Good attendance, some enthusiasm for empirical work, kept supervisory appointments but was sometimes not fully prepared.</td>
<td>Adequate attendance but with some absences, missing supervisor appointments, little interest shown in project</td>
<td>Poor attendance with many absences. Little interest shown in engaging in experimental work.</td>
</tr>
<tr>
<td><strong>Time Management</strong></td>
<td>Excellent time management and organization allowing multi-tasking. No reliance on supervisor for support in time keeping, all deadline met</td>
<td>Very good time management for the most part and able to organize tasks independently, all deadline met</td>
<td>Good time management but needing some support with organization, deadlines met</td>
<td>Poor time management when faced with complex tasks, lack of organization to prepare for tasks, one or more deadlines not met</td>
<td>Disorganized, poor time management; multiple deadlines not met</td>
</tr>
<tr>
<td><strong>Planning and design</strong></td>
<td>Made important contributions to planning and design with original and well thought out ideas.</td>
<td>Good attempt to plan/design experiments but still requiring significant supervisory input</td>
<td>Some attempt to plan/design experiments with some success</td>
<td>Some attempt to plan/design experiments but quality poor</td>
<td>Complete reliance on supervisor for planning and design</td>
</tr>
<tr>
<td><strong>Technical ability</strong></td>
<td>Comprehensive advances across the full range of skills</td>
<td>Good advance in most skills</td>
<td>Some skills lacking, but strong in others</td>
<td>Competent at only 1 or 2 of the expected skills despite extensive training</td>
<td>Few skills demonstrated</td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td>Excellent attempt at analysis and interpretation with very little/no correction needed</td>
<td>Very good attempt at analysis and interpretation with little correction needed</td>
<td>Good attempt at analysis and interpretation with some correction needed</td>
<td>Analysis and interpretation needed frequent correction</td>
<td>Little data analysis undertaken</td>
</tr>
<tr>
<td><strong>Independence/innovation</strong></td>
<td>Smooth project process with excellent evidence of understanding of relevant issues from the student, student-led proactive approach throughout. Novel and feasible approaches to the topic suggested by the student</td>
<td>Very good understanding of issues surrounding the project leading to some innovation and a proactive approach from the student.</td>
<td>Some understanding of issues surrounding the project but limited innovation, supervisor remains a major driving force in the work – some independent empirical study</td>
<td>Supervisor leading project process with little of the required input from the student</td>
<td>No evidence of innovation of independent thought. No independent empirical work</td>
</tr>
<tr>
<td><strong>Experimental record keeping</strong></td>
<td>Clear, legible, easy to follow with all data accurately recorded and appropriate detail for future replication or data mining</td>
<td>Well laid out with all data recorded. Some details lacking but mostly sufficient for future replication or data mining</td>
<td>Adequate record keeping with some issues that would limit future replication or data mining</td>
<td>Inadequate record keeping with data poorly stored and collated. Insufficient for future replication or data mining</td>
<td>Poor or absent experimental record. Large amounts of empirical data omitted. Insufficient for future replication or data mining</td>
</tr>
<tr>
<td><strong>Ethical application (if required)</strong></td>
<td>No more than typographical/grammatical corrections in the draft, is approved without</td>
<td>A few issues required some re- wording / clarity but no substantive issues</td>
<td>Substantive corrections or missing components (DMP, adverts, cover)</td>
<td>Draft suggested not taking it seriously or a lack of understanding of issues,</td>
<td>Ethical application not undertaken/poorly undertaken resulting in</td>
</tr>
</tbody>
</table>
the supervisor doing anything other than checking it, i.e. all feedback was incorporated by the student

in draft, supervisor makes corrections following feedback from committee and the application is approved

sheet… in draft, supervisor needed to chase the student up / corrections not implemented, but with significant supervisor input the application is approved

student struggled either with time keeping or not filling forms in correctly, multiple resubmissions required

supervisor taking over a task that had been given to the student

<table>
<thead>
<tr>
<th>Draft report</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draft report*</td>
<td>Submitted on time. Clear and complete, such that feedback could focus on nuanced and more advanced aspects. Few if any spelling and grammatical errors.</td>
<td>Submitted on time and generally good, but some issues such as an incomplete section or basic issues with organisation or content. Some spelling and grammatical errors.</td>
<td>On time and good in parts, but some issues such as missing sections or substantive issues with organisation and content. Poor spelling and grammar.</td>
<td>On time, but major issues with flow, structure and/or content needing comment. Little evidence of proof reading.</td>
<td>Poor and disorganised (or late submission without good reason), such that extensive and fundamental suggestions for improvement were needed</td>
</tr>
</tbody>
</table>

* Feedback on your draft does not reflect the grade your supervisor expects the final report to get. Rather it reflects your performance in writing a draft