# Title of project

Student name

# 1. Research aims

## 1.1 Background and motivation

Briefly describe the motivation and goals of the research, with references to previous work as needed. Include only the most relevant background, focusing on the previous findings that are essential to understanding the proposed research. If you are doing a novel extension of previous studies, briefly describe the previous findings, identify the novel factor in your study, and describe why it might be expected to change the results. If your study addresses a limitation in previous studies, briefly describe the previous findings, identify and briefly explain the limitation, and describe how your study addresses the limitation. If you are testing a novel prediction of a theory, briefly describe the theory and previous findings that support the theory and identify the novel prediction tested in your study. If you are testing for a moderating influence on a known effect, describe the known effect, identify the potential moderator, and explain why moderation might be expected. If you are testing for mediation of a relationship, describe previous findings on the relationship between the variables and briefly explain why the relationship might be mediated by the proposed factor.

## 1.2 Hypotheses/questions

Write a succinct description of the main hypotheses or questions addressed by the research. These should be the questions/hypotheses that will be assessed from your data, as described in section 3.1. Focus on the primary hypotheses of the study.

# 2. Methods

## 2.1 Participants

Describe the target population, sample size, and how subjects will be recruited. If the study will address a specific population, identify the population and the inclusion criteria. If there are any requirements for participation, identify the criteria and justification. If there are demographic criteria, such gender balancing or age matching, explain here.

## 2.2 Sample size justification

Provide a justification for your sample size based on a power analysis. Identify a target effect size for your main analyses, explain why this is a reasonable effect size to target, and report the power for detecting the effect with your sample size. Depending on your analysis, the effect size might be Cohen’s d, Pearson correlation (r), Cohen’s F, or partial eta-squared.

If there are comparable previous studies, the justification for effect size should refer to the size of effects observed in the previous studies. If there are no comparable previous studies, the justification could be based on what effect size would be theoretically or practically meaningful. In cases where sample size is limited due to practical constraints, the target sample size could be chosen as the smallest that could be realistically detected given the constraints.

Note that the power analysis should be based on the main tests of your hypothesis. If you are testing for a moderation effect, the power analysis should be for detecting the moderating effect (interaction), not for detecting a main effect. If you are performing a mediation analysis, the power analysis should be based on detecting a mediation effect, and not the main effect. The following shiny apps may be helpful for computing power in these cases:

Mediation: <https://schoemanna.shinyapps.io/mc_power_med/>

Moderation: <https://mfinsaas.shinyapps.io/InteractionPoweR/>

Interaction in ANOVA: <https://arcaldwell49.shinyapps.io/anova-exact/>

More information and links to other tools for power analysis can be found in this guide: <https://mgto.org/poweranalysisguide>.

## 2.3 Design

Briefly describe the design of the study. If you are conducting an experiment, identify the manipulated factors and indicate whether factors are varied within-subject or between-subject. If you are conducting a correlational study, identify the factors that will be analyzed. This section should be an overview of the design. Details about the conditions or measures should be described in the procedure and/or materials sections.

## 2.4 Procedure

This section should be like the procedure section of an APA-style research report. If your study measures responses to stimuli, describe what subjects will be judging for each stimuli, and the order of presentation of stimuli. (Note: the specifics of the stimuli will be described in the materials section). If subjects will perform in multiple conditions, describe how the conditions will be presented and any randomization or counterbalancing. If the procedure is different depending on the experimental condition, describe the conditions for different conditions. If your study involves questionnaires, describe the sequence of questionnaires that will be completed. If your study involves any deception, describe the deception and provide a justification.

## 2.5 Materials

This section should be like the materials section of an APA-style research report. If your study presents stimuli, describe the stimuli. If stimuli vary across experimental conditions, describe the differences in stimuli here. If your study uses questionnaires or self-report measures, describe the items. If you are using an existing scale or adapting from an existing scale, include a citation of the source and describe any deviations from the original scale. If your study uses specialized apparatus (eye tracking, VR), describe the apparatus here.

Full versions of any questionnaires should be submitted with your application as a separate document. For questionnaires in Chinese, provide an English translation.

# 3. Analysis plan

## 3.1. Main analyses

Describe the statistical analyses that will be performed to address the research hypotheses/questions identified in section 1.2, and how the results will be interpreted. If you are performing pairwise tests to analyze experimental results, describe the conditions that will be compared and the tests that will be performed to evaluate each hypothesis. If you are performing an ANOVA to analyze experimental results, describe the ANOVA and identify the results (main effect or interaction) that would test each hypothesis, and describe any follow-up tests and their interpretation. If you are performing a regression analysis, describe the regression model and identify the results that would test each hypothesis. If your measures are derived from raw responses, describe how the measure is computed (e.g., summing items from multiple items). If you plan to include covariates as control variables, that should be specified in the description of the statistical model.

## 3.2 Additional analyses

If you plan to perform additional analyses of the data beyond those specified in 3.2, describe the analyses and interpretations here. Some possible examples: manipulation checks, secondary analyses that address the main questions, exploratory analyses of correlations between measures, exploratory analyses of different subscales of the main measure, exploratory analyses of individual differences, exploratory analyses of possible moderation effects.

## 3.3 Data exclusion

If there is a possibility that some data will be excluded from analysis, describe the exclusion criteria. If outlier data points will be detected and removed, specify the criteria for identifying outliers. If subjects will be excluded because of failing to follow instructions or failing attention checks, describe the criteria and how it will be evaluated.

## 3.4 Other (optional)

If there is anything non-standard about your analyses, describe in this section and provide justification for your choices. Some examples: using one-tailed tests rather than two-tailed tests, using an adjusted alpha or alternate pairwise tests to control for multiple comparisons, using Spearman correlations rather than Pearson correlations. If your data will be transformed before performing analyses, describe the transformation and provide a brief justification.

If you will be performing standard analyses with standard inference criteria, then this section can be omitted.