



Institute of Human Nutrition

COLLEGE OF PHYSICIANS AND SURGEONS
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Sample Introduction to Research for Special Studies

The Introduction to the Thesis Research, which you are to submit in January, can be modeled on the introductory sections you see in most journal research articles. Typically, they begin with a line or two that places the reported (or in our case, planned) research in the context of the field. Then the background of this area of research is presented, with relevant citations and brief discussion of prior findings and their ambiguities. Conflicts among prior studies' findings are then usually presented, along with appropriate citations and details. Finally, the reported (or in our case, proposed) research is presented in a way that explains how it will (or may) add to the understanding in the field.

The Introduction should be submitted separately from the Thesis Proposal which is submitted in March. The purpose of the Thesis Proposal is to ensure that all students have thought through the research structure of their thesis project. To that end, they are required, as indicated in the MS Handbook, to "submit a brief (4-5 page) thesis proposal to the Director of the Master's Program. The proposal should: (1) state the purpose of the research including the hypothesis to be tested; (2) outline the approach chosen for testing the hypothesis, including the rationale for the approach; (3) briefly describe how the data will be analyzed, and (4) anticipated results."

This document has a different framework than either the Introduction or the Thesis manuscript, in that it is meant to show briefly the research question, the planned approach to its answer, the expectations about what kinds of data analyses will be used, and the types of findings (not the substance of the findings) that will result, before any of the work has been completed.

While the Introduction that must be submitted will explain what is known and not fully known relative to the research questions, thereby setting the stage for the project, the Proposal submission need not present that background. In much abbreviated form, an example of what is expected in a Proposal follows. Your own submissions should elaborate on the methods and other points, as much as needed for a naive reader to follow them.

Example: Study of the Maternal Body Components that are Determinants of Infant Birth Weight

1. The purpose of this research is to determine whether it is the gain of body fat or body water that is the determinant of the strong correlation observed in many studies between maternal weight gain during pregnancy and infant birth weight. A subsidiary purpose is to explore whether the relations observed (if any) differ in Black and White women. We hypothesize that maternal water gain is significantly associated with infant birth weight.
2. We plan to estimate maternal water and fat gain using a 4-compartment model of body composition. This requires separate measurements of total body weight, total body water (directly, by dilution of deuterated water), total body density (by underwater weighing), and total body bone mineral (by dual energy x-ray absorptiometry, DEXA). Total body fat is determined from these measurements using the equation of Selinger: $(VVV+uuu/XXX)$.

These measurements will be taken at 14 and 37 weeks of gestation, or as close to these times as possible, except for the bone mineral measurement, which will be taken only once, at a 3-weeks postpartum visit, and used in the above equation at both measurement times. Maternal gain of weight, fat and water will be determined by difference from the two computed values.

3. Multiple linear regression analysis will be used to identify significant predictors of infant birth weight. Standard factors known to be related to birth weight, including parity (0, 1 or more), maternal height, prepregnant weight, race/ethnicity, (etc.), will be included in these regressions. In initial analyses, we will determine the relation of pregnancy weight gain to birth weight with these other factors controlled, to demonstrate whether our results agree with prior studies of that relationship. The hypothesis testing regression will include the standard factors but, in place of weight gain, will include gain of fat and water.
4. The results we anticipate are regression coefficients indicating the magnitude of the increment in birth weight due to a given increment in maternal fat or water gain. Our results will also tell us whether the relations between changes in fat and/or water and birth weight are statistically significant. The clinical significance of any relation observed will also be considered.

We will also examine whether race (Black, White) influences, or interacts with, the relation we observe between fat or water gain and increased birth weight.

[For the report of these findings see: Lederman SA, Paxton A, Heymsfield SB, Wang J, Thornton JC, Pierson RN, Jr. Maternal fat and water gain during pregnancy: Do they raise infant birth weight? *American Journal of Obstetrics and Gynecology* 1999;180:235-40.]

Clearly, some studies will be more difficult to fit into this format. If yours is one of these, consider the main points of this assignment. You are to think about your research in a scientific way, considering and then explaining what you are hoping to learn, how your research approach will provide data to explore that issue, how you will set up the data to evaluate what conclusions can be drawn, and what measures will be used to establish the results of your study.

It is not important for your Thesis Proposal to be any specific length. What matters is whether it reflects an understanding of the purpose of the research, the methods that will be used to collect the critical data (and what constitutes critical data), and the analytic approaches that will be used to determine the answer to the research question. If you can do all this briefly, do so. If you need to provide more information to make your understanding of the research clear, provide that. It is worthwhile to be as brief as possible within these limits.