Getting started with thesis research: Develop a research question and design

Part 1: Develop a research question
The best research ideas begin with an idea about two (or more) variables. You might be interested in attractiveness and judgments of guilt in court room settings, what factors lead to job satisfaction, the development of religious identity, or depression and eating disorders. Whatever your interest you should begin by finding a relevant literature review. You may recall that a literature review is a secondary source article where an author or group of authors describe an area of research. You should try to locate the most recent literature review on your topic of interest.

One of the reasons I suggest that you read a literature review on the topic is to give you an idea of what has been done in your area of interest, and what theoretical or methodological gaps exist. While you read you should consider

- What questions have not been addressed?
- In what settings is research lacking?
- Are there any variables (or constructs) have not been examined but may be related to the issue?
- Have all methods (survey, experiments, observations) been used to examine the question or set of questions?
  - Are there alternative operational definitions for the constructs of interest that would help to generalize the findings?
- Are there any populations that have been ignored with regard to this issue (e.g., East Asians, mature adults, professionals, Buddhists)?
- Theoretically or methodologically are there alternative explanations for the phenomena than that proposed?

You will likely need to read several articles on your topic before you can articulate a clear research question that is strongly justified (see Part 2 below). Remember, your job as a researcher is to describe, predict, or explain psychological phenomena.

If you are a systematic person the following outline might help:
1) State your rough research idea or question or prediction (What relation exists between 2 or more variables?):
2) Make sure your research questions conform to something called the R.O.T.S. test by explaining the following:
   a) Explain how your research question is Repeatable (i.e. not a onetime event). For example, you would not want to ask why a particular person committed a crime. You need a situation that you could produce in a laboratory setting. You could investigate conditions under which someone is likely to be dishonest (this is related to example question I gave but is more general and is repeatable.)
   b) Explain how your research question is Observable
   c) Explain how your research question is Testable (i.e., could you create a situation under which to test your idea).
   d) Rework your original research question from #1 above make it more Specific.
3) Define an independent and a dependent variable:
4) Independent Variable (X):
   a) Operational Definition:
5) Dependent Variable (Y):
   a) Operational Definition:
6) Develop a working hypothesis. That is form an expectation/prediction about how X will impact Y.

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Part 2: Develop a research design

The hardest part is deciding on an interesting research question. However, you still have some work to do. **You must be sure that you can justify why this research question is important.** Justifying your research question is the first step in crafting an excellent paper. In fact, a good introduction justifies your research. Thus, if you do a lot of thinking upfront, it makes writing your paper, and defending your research a lot easier.

The APA style manual (6th ed) recommends that an introduction include answers to the following questions:

1. Why is the problem important?
2. How does the study (and research question) relate to previous work in the area?
3. What is the primary (and secondary) hypothesis?
4. How do the research hypotheses and research study relate to one another?

In designing your study you should keep these questions in mind. At this point in the process, you should already have a rough idea of how to answer questions 1 and 2, and you should be certain of question 3.

Starting with question 3, think about the broad variables in your research hypothesis. If this is the first time you have written a research report (or it has been a long time) I recommend having no more than three or four variables (and at least two) in your research question. Starting with one variable, and continuing with the others, brainstorm as many operational definitions as you can. Recall that an operational definition is simply a very precise measure or manipulation of a variable. The operational definition you decide to use will depend on a number of factors including 1) ethical constraints, 2) the type of research design you prefer to use, 3) previous measures or manipulations used in the field. Below I offer some guidance for each different kind of operationalization.

**Survey Measures:** Defining some variables is very easy. For example, when students have predictive research questions they can usually use survey methods, and for many constructs or variables there exists reliable and validated measurement scales. In the past, a group of students were interested in early childhood parental interactions and preference for short-term mates. They discovered that early childhood experiences are usually measured via the adult attachment scale (Collins, 1996). Further, they found a scale that measured preference for short-term mates. There are entire websites devoted to scales, and some researchers have developed and published so many measures that they have links to their scales from their personal websites. The following resources may help you:

http://www.muhlenberg.edu/depts/psychology/measures.html
http://www.webpages.ttu.edu/areifman/qic.htm
http://ipip.ori.org/ipip/

If you can’t find what you need from above, try putting the construct of interest in search engine, in a library database such as PsychInfo, or use google scholar. In some cases, students work really hard to find a scale to measure something really easy. For example, students have looked and could not find scales that measured 1) how many sexual partners a person has had 2) how much net income a person makes annually, 3) how much time a person spends getting ready (hygiene and grooming behaviors, or 4) how bad a person feels at the moment. In each case, I said, why not simply ask the direct question in a survey? If you are really only interested in the answer to a single question, just ask the question (e.g., how much time do you spend daily cleaning and grooming yourself?). For most other situations of course, it is best to find a validated and reliable measure. Often you can get ideas about what scales are used in your area of interest by reading reports in your area of interest.
**Observational Measures:** Sometimes defining your variables is trickier. For observational measures you should think about being in that situation. What kind of behaviors are likely to be elicited? Which behaviors are most clearly associated with the construct I am trying to measure? What is the best way to code the behaviors of interest? Will I be observing one individual or several individuals? How many raters will be used to code each sequence of events? Oftentimes, it is easiest to read papers and see how other researchers have handled the issue. Sometimes, it helps to go observe the behavior, if possible, with a coding schema in mind. This can serve as a practice run. These strategies will help you define your construct and develop a coding schema that makes sense.

**Experimental Measures:** Manipulated constructs may be the easiest or the hardest variables to operationalize. When you manipulate a construct there are two things to keep in mind. One is whether the manipulation is ethical. Is there a way to manipulate the construct of interest with minimal social, psychological, or other risk? Second, when considering control conditions, you should make sure that the conditions you create are exactly the same except for the one thing you are manipulating. Again, it is helpful here to go to the literature and see how other researchers have manipulated the variable of interest. It is also worthwhile to ask your instructor or advisor for help if you get stuck but would like to manipulate a variable both cleanly (no confounds) and ethically (minimal risk).

**Quasi-Experimental Measures:** Keep in mind that some independent variables are quasi-experimental. That is, you might be interested in a variable that cannot be manipulated (sometimes called an individual difference variable). These variables include drug use, educational attainment, age, gender, race/ethnicity, health status, attachment style, personality, etc.

**Ethical and practical consideration:** As you design your study keep ethical and practical issues in the back of your mind. This will help you as you write your IRB application and methods section in the future. Some things to consider:

- What have I done to minimize risks to participants?
- Are there benefits to participation?
- Will I use deception? Is it justified? Why?
- Will participation be anonymous (no names will be attached to data) or private (no one except the researcher will have access to the data)
- Will I be able to ensure that consent is voluntary and informed? If not, is this justified? Why?
- Will I be able to fully debrief participants? If not, why? Is this justified?
- Where and how will I recruit participants? Will I have access to the sample that I need?
- Do I need any special equipment (e.g., galvanized skin conductor? Reaction time software? Video camera?)

Once you have a research question and research design you should work closely with your advisor and begin writing your IRB application.