EXPERIMENTAL METHODS TO ASSESS
CONCEPTUAL MECHANISMS RATHER THAN
CLINICAL OUTCOMES

Workshop Module for
Transdisciplinary Understanding and Training on Research –
Primary Health Care (TUTOR-PHC)

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Experimental Methods to Assess Conceptual Mechanisms Rather than Clinical Outcomes  
TUTOR-PHC Workshop Module

Objectives
1. To understand experimental methodology (e.g., What are threats to internal validity?; How do true experiments control for threats to internal validity?)
2. To be able to design an experiment to test a particular theory or hypothesis related to primary health care.

Reading Assignments

Week 1


Optional:

Week 2


Week 3
No additional readings.

Tasks/Exercises:
Week 1
Identify the research question, hypotheses, variables, and threats to internal validity in the Sices, et al study. Discuss how the experimental design controls for these threats.

Week 2
Identify and define the elements of patient-centered care addressed in the readings. As a group, design an experiment to test the Stewart, et al’s theory about the impact of patient-centered care on outcomes.

Week 3
In pairs, design an experiment relevant to your own research question.
Discussion Summary
Number of participants: 5
Total number of messages: 51
Number of facilitator posts and comments: 28

Week 1 – Original facilitator post
Welcome to the Workshop with the long and convoluted title!

We are looking forward to lively discussion & the possibility for some very
creative inter-disciplinary ideas.

We have posted a detailed outline of the next three weeks.

This week you have two readings to get an overview of some issues in
research methods related to experiements. Namely, Isaac and Michael’s
chapter on research methods. The specific sections of most relevance are
noted.

The next reading (Sices et al) will form the bases of the the on-line
discussion. All the questions are listed in the overview.

Let's start with the following:
1st - if you have any questions from the chapter please through them out.
2nd - let's work through the following questions over the next 2 days in
relation to the Sices article:

What is the research question? What are the hypotheses being tested? What
are the independent and dependant variables in this study? How are the
independent and dependant variables operationally defined?

The other questions will be dealt with in the last ½ of the week.

Number of participant posts: 16
Number of facilitator comments: 12
Selected facilitator comments

Thank you for responding to the first set of questions. You have nicely
captured the essence of the Sices et al. (2004) article in terms of the
main research questions, hypotheses, independent and dependent
variables, and how these variables were operationalized. Great job!

For some of you, thinking experimentally might be novel. Others of
you might see the utility of the experimental approach but believe that
it doesn't satisfy your research needs and goals. There might also be
others who are well versed in this approach and use it regularly. I
hope that everyone will feel free to express their opinions about the
strengths and weaknesses of experimental methodology. I think that
there is great potential in this diverse group for bringing these
questions and issues to a deeper level of discourse and Graham and I
encourage this.

We don’t want to proceed too quickly, as we want to ensure that
everyone has had a chance to respond (and that we are all on the
same page) before we move on. For those of you who have not yet
responded, please do so before the end of tomorrow (even if only to
indicate your agreement with the summaries that Tom and Sandra have posted).
  
  o  It's nice to have you in the group, Leah. Thanks for your comments. You made an important point that many of the criticisms of the paper pertain more to external than internal validity. These are fine distinctions and if others in the group are not clear on this issue, you may want to revisit the Isaac and Michael chapter.

You mentioned that the five sets of 2 groups may differ in some systematic way. This is potentially a selection x experimental variable interaction - again, a threat to external validity. You are correct though that the authors do not give us enough information about the breakdown of response rates by condition.

The issue of statistical power and clinical significance are good points. Does this impact the *methodological* integrity of the study? The authors are interested in the question of whether a given independent variable makes a difference in the dependent variable -- does the manipulation make a difference.

**Week 2 – Original facilitator post**

We had a very good discussion last week. There may still be some uncertainty about the concepts discussed. This is normal if the notion of experiments as we are discussing them is new to you. We trust that most questions will be addressed as we work through the assignments for this week & next.

Our Goals for this week are: 1) Learn how to select a sub-component of a theory for testing 2) Design an experiment to test a sub-component of a theory.

You should have read the theoretical paper (Stewart et al chapter) on the patient-centred clinical method and a study that demonstrates how the key components of the theory are operationalized (Stewart et al (2000) journal article). Copies of the actual measures of patient centered care were included in the readings so you have a better understanding of the study.

The first set of questions are: 1) From the Stewart et al article,

a) What elements of the patient-centred clinical method are being tested?

b) What is the operational definition of these elements of the theory?

c) What appear to be the critical elements in theory that should be tested more fully?

We need to wrap up discussion on these questions by Tuesday or Wednesday at the latest. Have fun with this.

**Number of participant posts:** 23

**Number of facilitator comments:** 9

**Selected facilitator comments**

  o  We are off to a very thorough start this week.

    I think it may be helpful to clarify what we mean by an operational definition.

    Basically, it is how a concept is measured. In this weeks articles, there
are multiple levels to consider.

There is the overall theory, the subcomponents/concepts (e.g. finding common ground), and 2 measures of each concept (patient ratings & audio tape).

see http://en.wikipedia.org/wiki/Operational_definition

For some more thoughts

Let's work toward a tighter articulation of this in response to :What is the operational definition of these elements of the theory?

Week 3 – Original facilitator post

Hi everyone:

You are doing an excellent job of thinking through these issues.

Now it's your turn to try to design an experiment to test the elements of the theory we have discussed over the past couple of days.

Graham and I were thinking that this might be fun to work through the next set of questions in small groups. I know that Jennifer will be away at the end of the week and we want to maintain these groups for the last week's assignments -- isn't it hard to believe we have just over a week left of working with you in TUTOR?

Assignment: Design an experiment to test the elements of the theory

I will create a separate thread for each group so that you can work through the following questions together. You will be responsible for responding to the other members of your group (i.e., you don't have to read all of the posts, but you are welcome to).

After you have worked through these questions, and thought about how you would create an experiment to address the hypotheses, please post a brief summary so that the whole group can get a sense of what you came up with and what you wrestled with. You are welcome to be as narrow as you want (e.g., if you want to keep things simple, you could just address a portion of the model/question); alternatively, you are welcome to challenge yourselves a bit more by designing a more complex experiment.

Questions:

What would be the major threats to internal validity in this study?

Describe how each of the treats to internal validity might be operating in relation to the problem examined in this study?

How does this experimental design control for these threats?

What would be the populations used in the study and why?

Have fun with this!

Number of participant posts: 12
Number of facilitator comments: 7
Selected facilitator comments

- One suggestion. Keep it simple. For both the ongoing development of an experiment for the pt-centred method & your own studies. The
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strength of experimental designs are their tight control (i.e., internal validity). The weakness is they cannot handle multiple complex theoretical issues. This is handled through repeated small experiments that address a series of nested or sequential questions.

So, our goal is for you to design 1 small experiment. For this exercise I would encourage you to not get too hung up on the feasibility/practical issues. Keep them in mind but don't abandon an idea because you think it is totally unworkable. A related issue in experiments is that they often use analogs. In the article you read they used vignettes rather than real patients.

Hope this helps.

- Some clarification
  1st an RCT is an experiment. However, the workshop is focusing on experiments related to mechanisms rather than outcomes.

What distinguishes the "mechanism experiment" from the "RCT experiment"? 2 majors things a) The purpose. In the experiment we are discussing the purpose is to understand how things work. RCTs are interested in improving patient outcomes.

b) The outcome. It is confusing in that the dependant variable in a RCT & a mechanistic experiment could be the same. There are outcomes in a mechanistic experiment that would never be acceptable in a RCT such as behavioral intention etc.

In addition, the participants in the study may distinguish. As mentioned, you can do an excellent mechanistic experiment using students & mock patients. This could provide a great deal of understanding about how things work. However, you would never call it a RCT.

Participant Feedback
Average workshop rating (1=poor, 5=excellent): 4.0
Selected comments

Comments related to the instructor
Both instructors tried. More flexibility re: group process and openness to cross disciplinary thinking/assumptions may have helped.

The most useful part of this workshop was
It was helpful as it addressed the important topic of how to measure conceptual mechanisms which is of particular interest to me.

Suggestions for improvement
The difficulty in this course seemed to be getting on the same page regarding the underlying disciplinary assumptions – hence time was spent trying to clarify this via semantics instead of directly.

This workshop module was offered in November 2004. For more information, please contact the TUTOR-PHC program manager at tutor@uwo.ca.