Research Methods in Behavioral and Social Sciences

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• Methodology Matters: Doing Research in the behavioral and social science

• Creative Hypothesis Generating in Psychology: Some Useful Heuristics
Methodology Matters: Doing Research in the behavioral and social science

Research Methods As Opportunities And Limitations
Question

How do you like this paper?

I like …
I wish…

Select a Volunteer
Research Strategy

Maximize criteria:

Generalizability
Precision
Realism
there are four quadrants for two axes, but only three criteria to maximize (A, B and C). Can you think of a criterion that may be maximized using the methods on the top right? (i.e. Experimental Simulation and Field Experiment.)
Discussion

Question: what research strategies do you intend to use for your project? Justify your choices.
1. Our project aims at evaluating different implementations of mixed-reality interfaces. Thus, it will consist of experiments to compare time-to-task under different interfaces. Given that these interfaces can't be fully implemented, we'll use **Wizard-of-Oz** to mock some of the interactions. Finally, we will conduct **semi-structured interviews** to understand why users behaved the way they did given an interface.

--Danilo Gasques Rodrigues

2. We intend to use experimental strategies in our project. Our project is about providing an application to ease the process of memorizing different things and events. It aims to help people to remember where they have put their belongings or what they wanted to memorize (such as addresses or phone numbers). We would like to provide an experiment which is very similar to real world. During the experiment participants asked to change the place of a few items and do a series of actions and at the end answer to a questionnaire which analyze users’ ability to remember and compare the users who have the app with others.

--Mohammad Motiee
Research design

Goal:

*gain information about phenomena and relations among them.*
Measures

self-reports
observations
trace measures
archival record

Question: what measures you intend to take in your project and why?
Discussion

How do you achieve randomization in your project?
Manipulate variables

selection, direct intervention, induction

How to choose means of manipulation of variables?

Select a Volunteer
Summary

Results depend on methods.

No possible to maximize all desirable features.

More evidence, more credible.
Creative Hypothesis Generating in Psychology:
Some Useful Heuristics

William J. McGuire (1925-2007)

Considered by some to be the “Father of Social Cognition”
Developer of: “Inoculation Theory”
Creative Hypothesis Generating in Psychology

- There is a common imbalance in methodology courses
- Heavy concentration on hypothesis-testing vs ignoring hypothesis-generating
Creative Hypothesis Generating in Psychology

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- Heavy concentration on hypothesis-testing vs ignoring hypothesis-generating

- 49 creative heuristics
  - often been used in psychology research
  - are teachable
  - range from common sense to sophisticated data analyses
Creative Hypothesis Generating in Psychology

- from the Introduction:
  - Research involves in generating and testing assumptions
  - Our education system largely ignores “generating hypotheses”
  - Creative hypothesis-generating can be tough
Creative Hypothesis Generating in Psychology

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  - Research involves in generating and testing assumptions
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Why?

In class activity: discuss it for 1 minute

Select a Volunteer
Creative Hypothesis Generating in Psychology

- Our education system largely ignores “generating hypotheses”
  - New world of work vs. Old world of school

- Creative hypothesis-generating can be tough
  - Similar ideas
  - Low impact
  - Not Feasible

Creative Hypothesis Generating in Psychology

- Our education system largely ignores “generating hypotheses”
  - New world of work vs. Old world of school

- Creative hypothesis-generating can be tough
  - Similar ideas
  - Low impact
  - Not Feasible
  - Customers don’t buy “products”,
    Customers buy “solutions to problems”

Creative Hypothesis Generating in Psychology

● 49 Heuristic, main categories:
  I. Requiring sensitivity to provocative natural occurrences
  II. Involving simple conceptual analysis (direct inference)
  III. Calling for complex conceptual analysis (mediated inference)
  IV. Demanding reinterpretations of past research
  V. Necessitating collecting new data or reanalyzing old data
Creative Hypothesis Generating in Psychology

I. Heuristics Requiring sensitivity to provocative natural occurrences
Observe and study
Creative Hypothesis Generating in Psychology

II. Heuristics Involving simple conceptual analysis (direct inference)
Considering other conclusions from a study and take a different point of view
Creative Hypothesis Generating in Psychology

In class activity (2 minutes)

Heuristic title: *Utilize Opposite Surface*

- *Description:* create a distinction between exterior and interior, front and back, or bottom and top. Make use of both surfaces for complementary or different functions. This can increase efficiency in the use of surfaces and materials, or facilitate a new way to achieve a function

- *Apply to*
  - A chair

Select a Volunteer
III. Heuristics Calling for Complex Conceptual Analysis (mediated Inference)
Use conceptual structure or metatheories to evoke thoughts
Creative Hypothesis Generating in Psychology

IV. Heuristics Demanding Reinterpretations of Past Research
Look into single past studies, discover by integrating multiple past studies
Creative Hypothesis Generating in Psychology

V. Heuristics Necessitating Collecting New Data or Reanalyzing Old Data
Qualitative analyses and Quantitative analyses

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<td>Like Easy</td>
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**Definition:**
- **Qualitative Data:** The type of data that describes properties or characteristics used to identify things.
- **Quantitative Data:** The type of data where the values have been measured or counted.

**Example:**
- Puppy’s ears are long.
Creative Hypothesis Generating in Psychology

In class activity (2 minutes)

Which category or sub-category relates to your project (or your research) the most?

Select a Volunteer
Creative Hypothesis Generating in Psychology

What is the difference between “imagine the effect of reducing a variable to zero” and “Alternative manipulations of the independent variable”

“... in my opinion I think E13 and F16 are actually very similar and there’s not too much difference in them, it my just depend in the case you want to use them.” - Jorge Garza

“To me, it feels like reducing a variable to zero is a binary experiment while manipulating an independent variable is operating in continuous space. By this I mean that in E13 the change on a variable seeks to determine whether the variable is a necessary foundation for a dependent variable. In contrast, F16 seeks to model the output when an independent variable is changed …” - Minh Nguyen