

Research Methods in Behavioral and Social Sciences

Xu Li

Alireza Khodamoradi

- 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

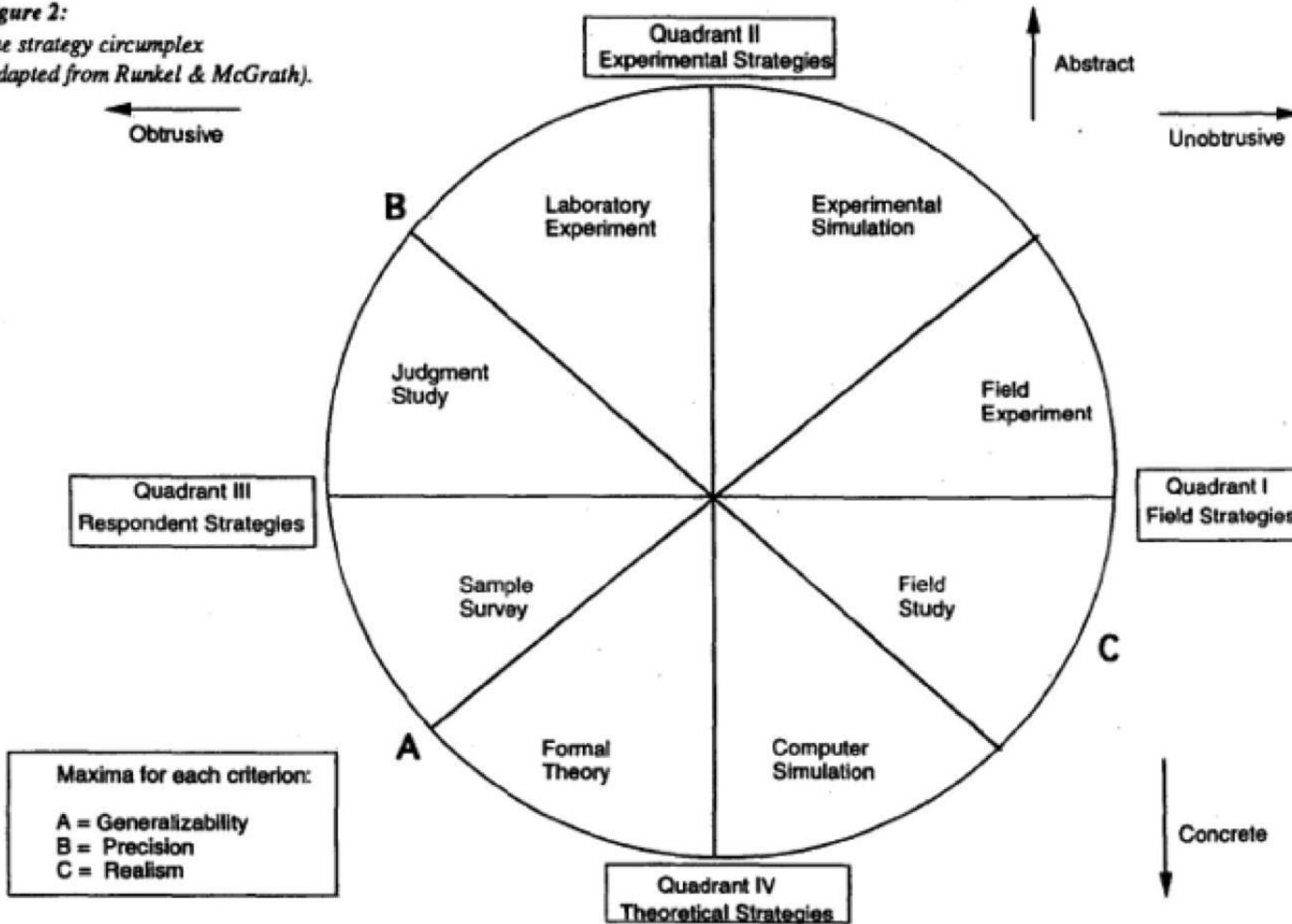
Maximize criteria:

Generalizability

Precision

Realism

Figure 2:
The strategy circumplex
 (adapted from Runkel & McGrath).



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.

Comments

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 Motiei

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.

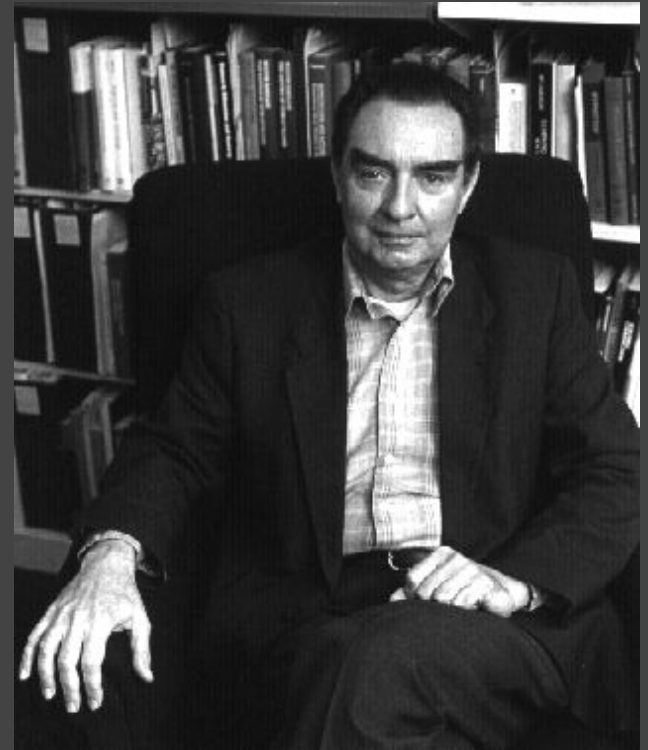
More evidence, more credible.

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: Some Useful Heuristics

William J. McGuire

Yale University, Department of Psychology, P.O. Box 208205, 2 Hillhouse Avenue, New Haven, Connecticut 06520-8205

KEY WORDS: creativity, heuristics, methodology, theory construction

ABSTRACT

To correct a common imbalance in methodology courses, focusing almost entirely on hypothesis-testing issues to the neglect of hypothesis-generating issues which are at least as important, 49 creative heuristics are described, divided into 5 categories and 14 subcategories. Each of these heuristics has often been used to generate hypotheses in psychological research, and each is teachable to students. The 49 heuristics range from common sense perceptiveness of the oddity of natural occurrences to use of sophisticated quantitative data analyses in ways that provoke new insights.

CONTENTS

I. HEURISTICS REQUIRING SENSITIVITY TO PROVOCATIVE NATURAL OCCURRENCES	3
A. <i>Recognizing and Accounting for the Oddity of Occurrences</i>	3
B. <i>Introspective Self-Analysis</i>	7
C. <i>Retrospective Comparison</i>	8
D. <i>Sustained, Deliberate Observation Heuristics</i>	9
II. HEURISTICS INVOLVING SIMPLE CONCEPTUAL ANALYSIS (DIRECT INFERENCE).....	11
E. <i>Simple Conversions of a Banal Proposition</i>	11
F. <i>Multiplying Insights by Conceptual Division</i>	12
G. <i>Jolting One's Conceptualizing Out of its Usual Ruts</i>	14
III. HEURISTICS CALLING FOR COMPLEX CONCEPTUAL ANALYSIS (MEDIATED INFERENCE).....	16
H. <i>Deductive Reasoning Procedures</i>	17

1

0084-6570/97/0201-0001\$08.00

Creative Hypothesis Generating in Psychology

- There is a common imbalance in methodology courses
- 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: Some Useful Heuristics

William J. McGuire

Yale University, Department of Psychology, P.O. Box 208205, 2 Hillhouse Avenue, New Haven, Connecticut 06520-8205

KEY WORDS: creativity, heuristics, methodology, theory construction

ABSTRACT

To correct a common imbalance in methodology courses, focusing almost entirely on hypothesis-testing issues to the neglect of hypothesis-generating issues which are at least as important, 49 creative heuristics are described, divided into 5 categories and 14 subcategories. Each of these heuristics has often been used to generate hypotheses in psychological research, and each is teachable to students. The 49 heuristics range from common sense perceptiveness of the oddity of natural occurrences to use of sophisticated quantitative data analyses in ways that provoke new insights.

CONTENTS

I. HEURISTICS REQUIRING SENSITIVITY TO PROVOCATIVE NATURAL OCCURRENCES	3
A. <i>Recognizing and Accounting for the Oddity of Occurrences</i>	3
B. <i>Introspective Self-Analysis</i>	7
C. <i>Retrospective Comparison</i>	8
D. <i>Sustained, Deliberate Observation Heuristics</i>	9
II. HEURISTICS INVOLVING SIMPLE CONCEPTUAL ANALYSIS (DIRECT INFERENCE).....	11
E. <i>Simple Conversions of a Banal Proposition</i>	11
F. <i>Multiplying Insights by Conceptual Division</i>	12
G. <i>Jolting One's Conceptualizing Out of its Usual Ruts</i>	14
III. HEURISTICS CALLING FOR COMPLEX CONCEPTUAL ANALYSIS (MEDIATED INFERENCE).....	16
H. <i>Deductive Reasoning Procedures</i>	17

1

0084-6570/97/0201-0001\$08.00

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

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

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”

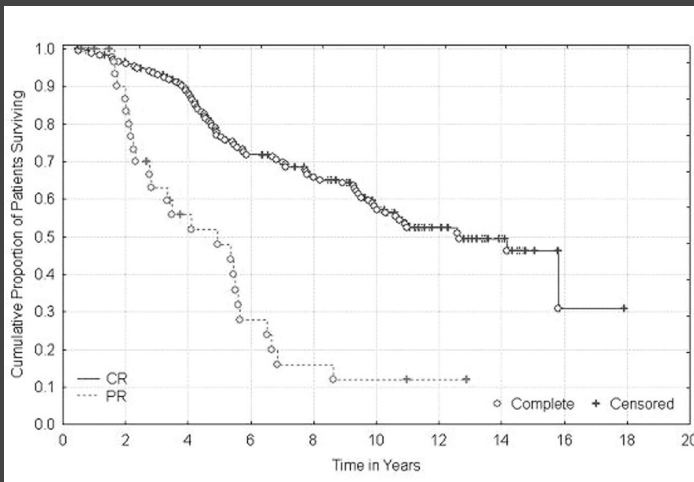


Creative Hypothesis Generating in Psychology

- 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

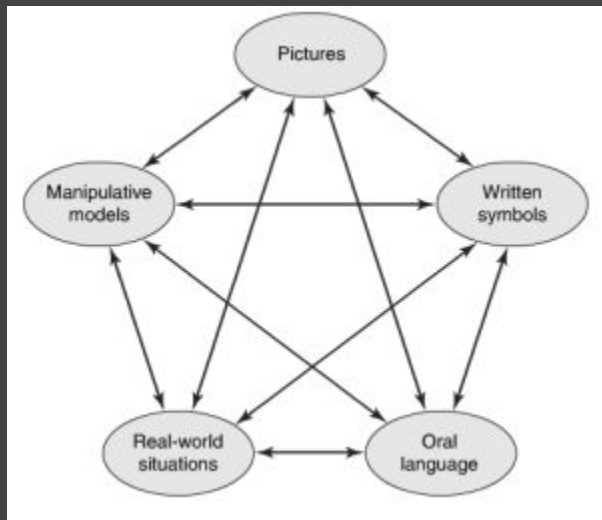
I. Heuristics Requiring sensitivity to provocative natural occurrences
Observe and study



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)

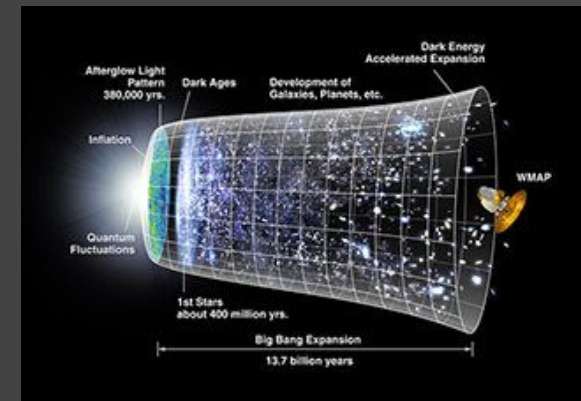
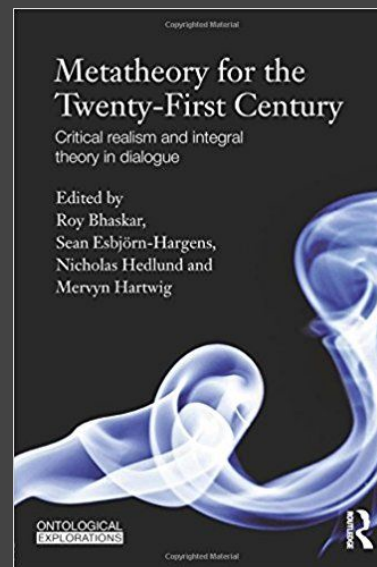
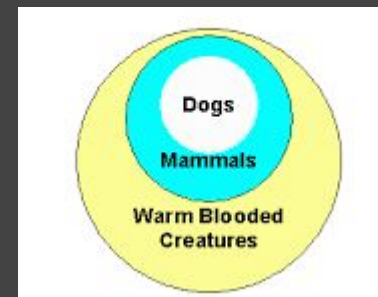
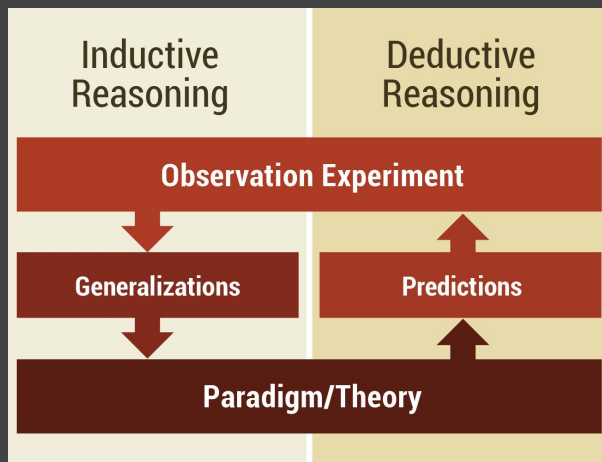
Heuristic title: *Utilize Opposite Surface*

- *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

Creative Hypothesis Generating in Psychology

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

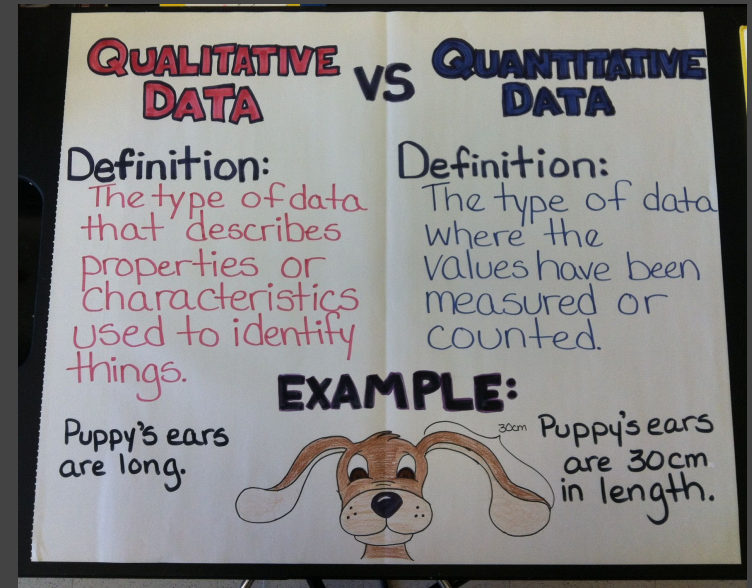
Look into single past studies, discover by integrating multiple past studies



Creative Hypothesis Generating in Psychology

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

Qualitative	Quantitative
Like Easy	23,406 4.3
Awkward slow	2m32s
Squirrel	76.8%
Efficient	\$45,849
Ambiguous How	1,127 3.76%
Confusing	€12.75



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 “*imagining 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