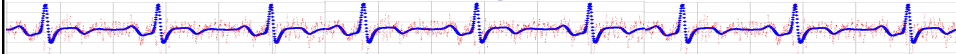


Empirical Research Methods in Information Science

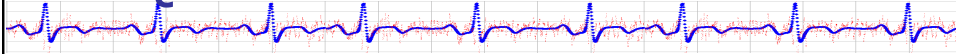
IS 4800 / CS 6350



Lecture 4

1

Quiz #2

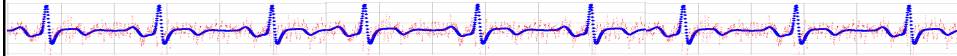


<https://tinyurl.com/IS4800Q293>

Don't forget your name!!

2

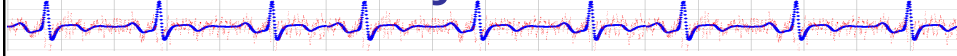
Review



- Population & Samples
 - Random vs. Biased samples
 - Volunteer bias
 - Internet bias
 - External & Internal validity of a study
 - Eligibility (inclusion & exclusion)
 - Recruitment protocols & compensation

3

Review: Ethical Principles in Human Subjects Research



- Respect for persons
- Beneficence
- Justice

Identified in Belmont Report and enshrined in all subsequent federal guidelines

4

NU Guidelines for Student Research Projects Involving Human Subjects



- If...
 - normal part of the student's coursework;
 - is supervised by a faculty member;
 - purpose is development of the student's research skills;
 - does not present more than minimal risk
 - does not include any persons under 18
 - does not include any vulnerable populations
 - does not involve any sensitive topics
 - will no result in publication
- Then, can proceed without IRB approval. But,
 - Must submit proposal to instructor first.
 - Must obtain verbal consent.
 - Must give instructor as point of contact if any questions.

5

Deception



- Active
- Passive

- Remediation
 - Debrief

6

Science Gone Bad

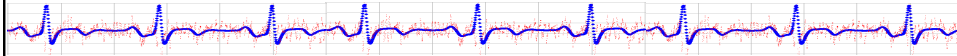


- Unintentionally
- Intentionally

Fraud in research

What kinds of fraud happen?
Why does it happen?
How can you tell?
How is it dealt with?
What prevents it from happening more?

Fraud in Research



- Types of Research Fraud
 - Outright fabrication of data
 - Altering data to make them “look better”
 - Claiming credit for work done by others
 - Attaching your name to a study you had little to do with

- How do we deal with fraud?

9

POLITICAL SCIENCE

When contact changes minds: An experiment on transmission of support for gay equality



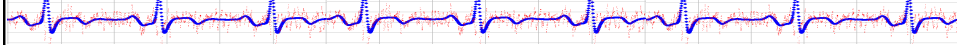
Michael J. LaCour¹ and Donald P. Green²

Can a single conversation change minds on divisive social issues, such as same-sex marriage? A randomized placebo-controlled trial assessed whether gay ($n = 22$) or straight ($n = 19$) messengers were effective at encouraging voters ($n = 972$) to support same-sex marriage and whether attitude change persisted and spread to others in voters' social networks. The results, measured by an unrelated panel survey, show that both gay and straight canvassers produced large effects initially, but only gay canvassers' effects persisted in 3-week, 6-week, and 9-month follow-ups. We also find strong evidence of within-household transmission of opinion change, but only in the wake of conversations with gay canvassers. Contact with gay canvassers further caused substantial change in the ratings of gay men and lesbians more generally. These large, persistent, and contagious effects were confirmed by a follow-up experiment. Contact with minorities coupled with discussion of issues pertinent to them is capable of producing a cascade of opinion change.

Science, 12 Dec 2014

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Gray areas

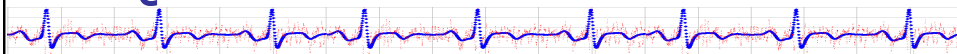


- Selecting only the best data for publication
- Using the “least publishable unit” rule
 - Deriving several publications out of a single study
- Dropping subjects (data points) without justification
- Fishing by design (using many outcome measures)
- Post-hoc Fishing (methods, analyses)
- Running subjects until you get your result
- Running a longitudinal study until you get a result

- How to avoid?

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Ethnography & Qualitative Research



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Overview of Research Methods

- quantitative
 - descriptive
 - correlational
 - experimental
 - demonstration
- qualitative
 - ethnography
- mixed

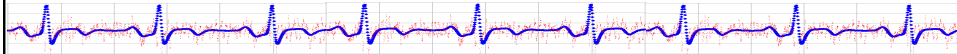
13

Quantitative vs. Qualitative Research Methods?

- Where did the methods come from?
- Kinds of data
- Kinds of analyses
- Kinds of explanations
- Exploratory vs. Confirmatory
- Generalizable theories/relationships vs. in-depth analysis of particular cases

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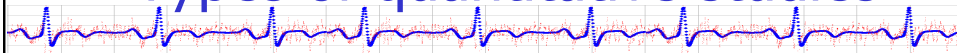
Quantitative research methods



- Based on physical science research paradigm
- Important ideas: hypothesis, prediction
- Data in the form of variables: dependent, independent
- Attempts to “prove” a causal relationship between the independent variable(s) and the dependent variable
- Data collected – represented as tables
 - Rows – observations
 - Columns - variables
- Data is analyzed using statistics
- Proof in the form of statistical significance levels

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Types of quantitative studies



- Descriptive
- Correlational
- Randomized, Controlled Experiments
- Demonstrations
- Quasi-experiments (“naturally occurring” IV)

Examples:

H1:icons with text labels are better than icons without text labels?

H2:color displays lead to employees spending more hours each day working at their computers

H3:more hours spent on the Internet by teenagers leads to increased psychological and behavior problems

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Advantages/disadvantages of quantitative studies



- + Systematic rules and procedures already worked out, and can be followed
- + Traditional, accepted as “proof”
- Closed-ended questions may lead to ignoring important factors and relationships
- Quantitative methods cannot handle phenomena that are difficult to turn into variables

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Qualitative research methods



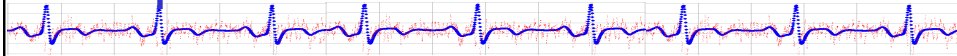
- Developed by social scientists
- Used for exploratory studies where important factors not yet identified
- Used for studies involving people’s subjective experience

Data collection: field observations, open-ended interviews, focus groups, examining text-based artifacts (manuals, email logs, customer support logs).

Data: text, observations, video, audio,

18

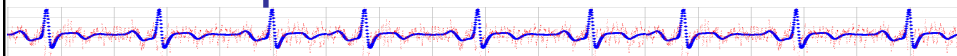
Advantages/disadvantages of qualitative methods



- + more innovative, creative, and exploratory
- + capable of addressing issues that do not lend themselves to being described by variables
- + lets you discover things you had not thought of
- conclusions may be less credible

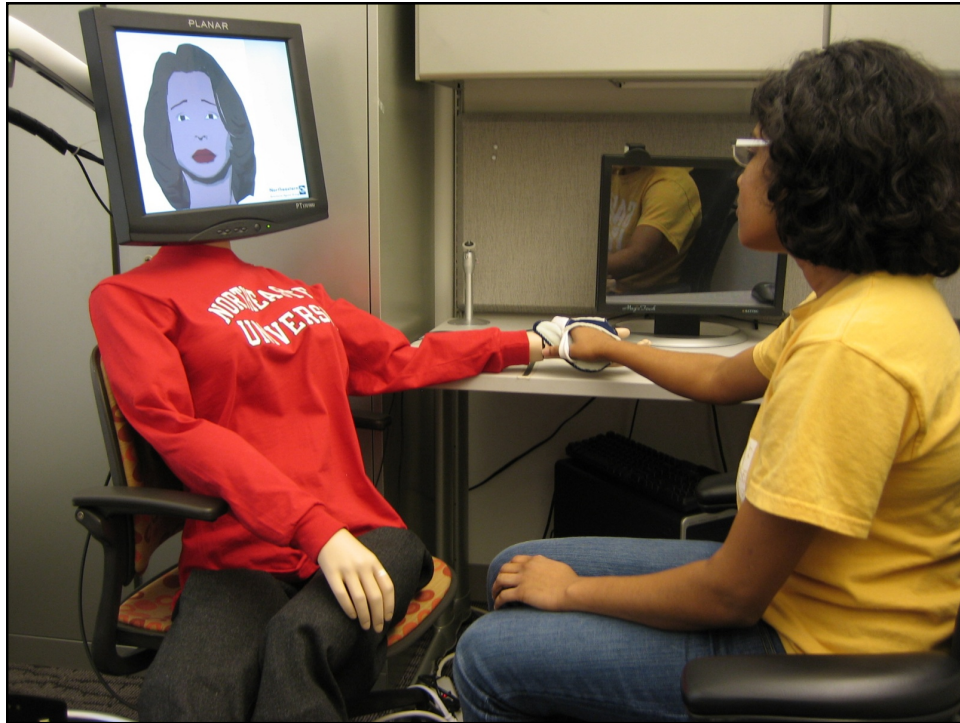
19

Example: Touchbot



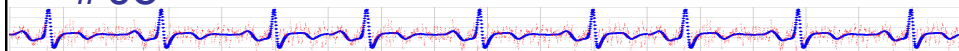
Semi-structured interview
following quantitative descriptive
study

21



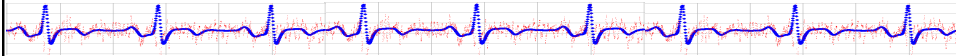
What were your overall impressions?

#08



- "I thought it was interesting. I've worked with a computer before, where you can tell it to do things... like my computer does that.. but the technology's not very good it doesn't hear you very well when it types things. So it seemed like, the recognition was really good. That it recognizes what you say. But the hand thing was weird.. I don't think it really felt natural, it wasn't like, it was squeezing you, it was more like a machine moving, and you're like 'oh, okay, it's moving'."
- "Like I was thinking that if it was really grasping you then the fingers should move too, coz it was only just coming from the palm, so only felt that movement and not the rest of the hand, so that's why it didn't feel real."

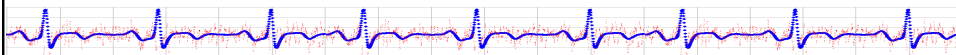
What were your overall impressions?



- #09
- "I really thought it was very helpful, very informative and the information was presented in a non-threatening way. It helped my attention, and I think, although I know about skin cancer, about the SPF factors, I learned more today."
- #10
- "I thought it was weird to have the body"

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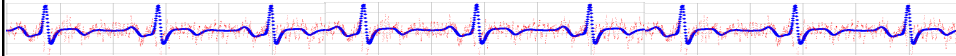
What were your overall impressions?



- #11
- "I found it interesting. And, I've never conversed with a computer character, and it wasn't as bizzare or strange or disturbing as I ever might have anticipated. The material was well presented, ..."
- "The handshake, I think, needs some work. Not the handshake, the hand squeezing. I just found that, if you're trying to convey reassurance that it seems, um, distracting and/or even unproductive, because, it doesn't, the times that it would occur, seemed off, somehow. I'd have to study that more, be a part of, I think you could do just the hand squeezing focus, aspect, of this, I think if you wanted to make it more effective. Because once with all this conversation, and answering and so forth, and all of a sudden this glove will start puffing off her, and it seems like some sort of puff-out kind of apparatus as opposed to squeezing of the hand."

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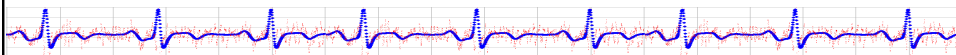
What were your overall impressions?



- #18
 - "Enjoyable, very different, very comfortable"
- #19
 - "I think it was kind of weird, once she was squeezing it, because you can't predict it, so that I kind of freaked me out I startled every time she was squeezing it..."
 - "At first I tried to like figure out a pattern to figure out when she would squeeze it, but I couldn't. It was kind of normal.. I was like, I felt like I was reacting like I would to like a normal person, like I found myself nodding..."

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What were your overall impressions?



- #20
 - "It was very awkward"
- #22
 - "It was awkward interacting with laura, and it made it hard to concentrate on some of the things that she was saying"

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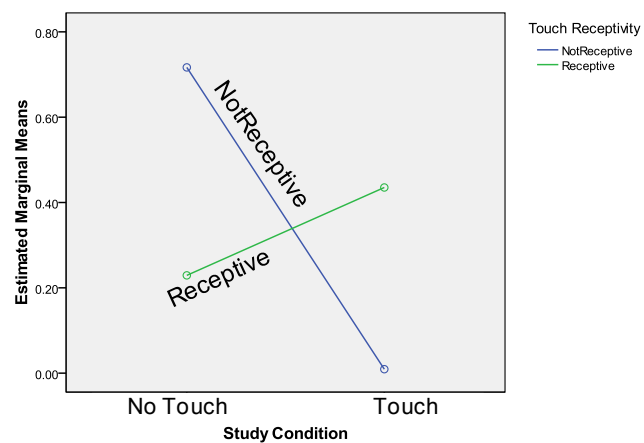
Follow-up

- Developed questionnaire for “touch receptivity”
- Conducted 2x2 experiment to test hypotheses

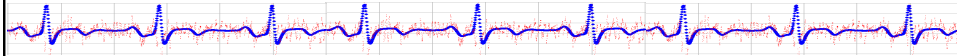
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Empathic Touch

Estimated Marginal Means of Change in WAI Over Baseline



Mixed Methods



Pragmatic philosophy – find out whatever you can using whatever methods are possible

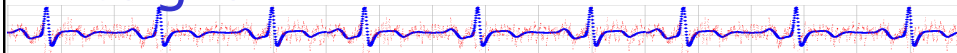
Involves both qualitative and quantitative elements
→ (at least 2 stages of research)

Advantages/Disadvantages

- + combines structure and flexibility
- requires more time and resources

30

Examples of Mixed Method Designs

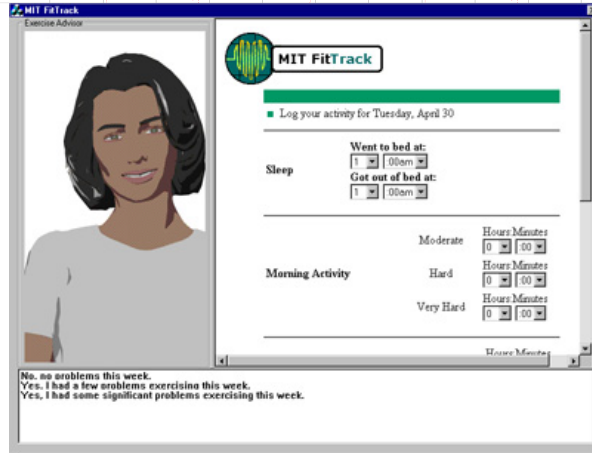


Pattern 1: “instrument” data followed by in-depth interview to get insight on the reasons for the observed relationships and capture any insights you overlooked in study design

Pattern 2: exploratory study followed by survey or experiment to generalize the results – representative of a long-term research program

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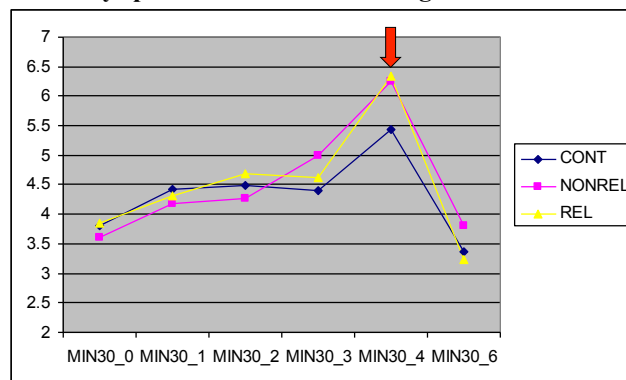
Intervention Efficacy Study: MIT FitTrack



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Behavioral Results

Days per week over 30 minute goal



Only difference between groups is WK4, CONTROL < AGENT $p=.06$

Significant increase WK0-WK4 $p<.001$
Significant decrease WK4-WK6 $p<.001$

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Qualitative Analyses Repetitiveness

■ Most frequent complaint

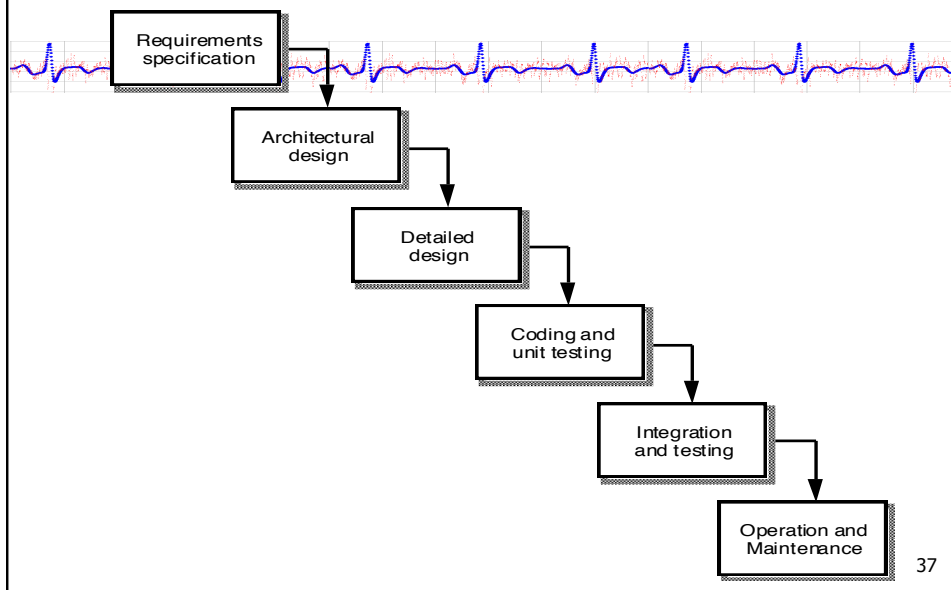
The first couple of days I was impressed by it. But, there didn't seem to be a lot of variety going on after that, so it kind of lost my interest, it lost the engagement factor. Maybe, six or seven days into the study I could almost predict what she was going to say, and once the engagement was lost you sort of lose the power of the animated instructor. ... (NON-RELATIONAL)

Like 15 days into the study when I could almost predict what she was going to say, it became easier to do things like check my mail in between her responses. ... Even with just little bits of variety your mind doesn't shut off. (NON-RELATIONAL)

In the beginning I was extremely motivated to do whatever Laura asked of me, because I thought that every response was a new response. Whereas, towards the end I could tell what she was going to say to a couple of my responses. (RELATIONAL)

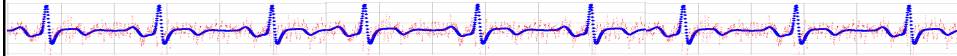
35

When to do which studies?



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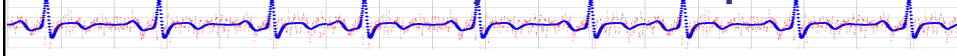
Some Qualitative Research Methods



- Content analysis
- Case Study
- Ethnography

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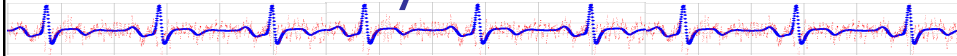
Content Analysis Example



- You want to review all 14,000 emails sent to customer support over the last year to determine
 - How many of them have positive things to say about your company?

39

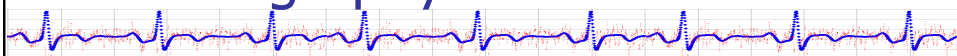
Case Study



- In-depth, longitudinal examination of a single instance or event
 - Not randomly selected; selected for expository or other purposes
- Usually performed retrospectively
- not necessarily qualitative, e.g., time-series analysis
- Types
 - Illustrative case studies describe a domain
 - Exploratory case studies are a way to gather initial information about a new field of inquiry
 - Critical instance case studies review a situation of unique interest (e.g., failure analysis)
- No formal methodology
- Goal: tell a coherent "story" with lessons learned

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Ethnography



The art and science of describing
a group or culture.

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Bronislaw Malinowski

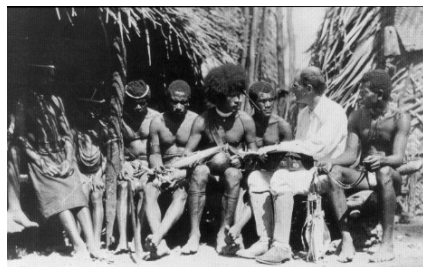
- 1914, Anthropology grad student, traveled to Papua, New Guinea
- He became stranded.
 - WWI, as a Pole from Austria-Hungary in a British controlled area, he was unable to leave.
- After a period in which he actively avoided contact with the native Trobrianders, who he considered to be "savages", Malinowski finally decided, out of loneliness, to participate in their society.
- After he did so, Malinowski learned the local language, formed close friendships with the people and is even rumoured to have fallen in love with one of the islanders.
- It was during this period that he conducted his fieldwork on Kula and produced his theories of Participant observation, which are now key to anthropological methodology



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Ethnography

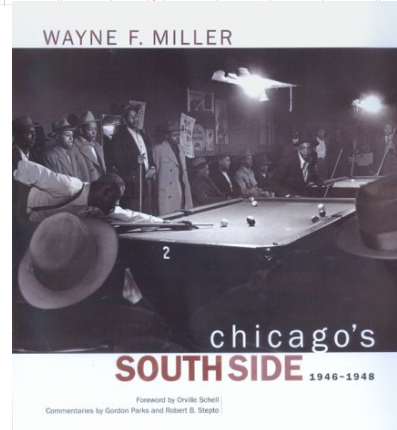
- Invented in 1915 by Bronislaw Malinowski
 - Start of cultural anthropology
 - Purpose: to become intimately familiar with a way of life by living it ("emic" perspective)
 - Method: use multiple sources of info
 - "Things are not what they seem."
 - People can't always tell you what they do.
 - To make authoritative claims about a culture you must have been there, done that.



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Ethnography

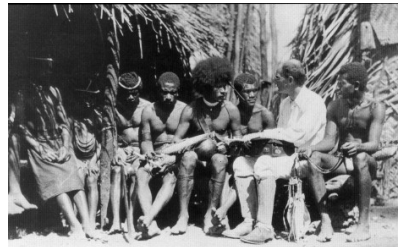
- 30's-60's focus on ordinary life
- "Chicago sociology"
- Studies of cat houses, insane asylums, jazz clubs, wine alleys, public toilets, race tracks, etc.



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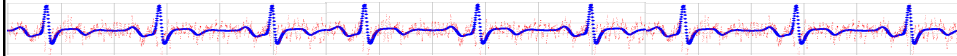
Ethnography

- Formally – the analysis, interpretation and writeup of all information to form a holistic description.
- "Triangulation" – checking one source against another
- Be aware of your own biases & preconceptions



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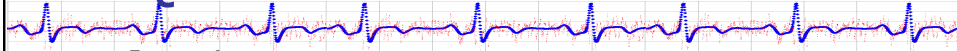
Ethnography Fieldwork Methods



- Participant vs. Non-participant
- Overt vs. Covert (ethical issues?)
- Observation
 - 6 months – 1 year (not!)
- Interviews
 - Formally structured
 - Semistructured
 - Informal

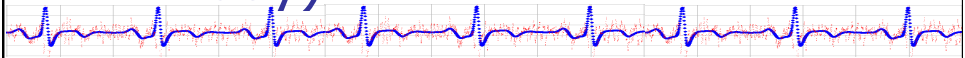
50

Questions



- Interview
 - Grand tour questions
 - Open-ended
 - Closed-ended
- Questionnaires
 - Open-ended
 - Closed-ended
 - Scale
 - Likert
 - Semantic differential
 - Partially open-ended (“other”)

Ethnography (Observational Study) Exercise



You have been asked to develop a website to sell eyeglass frames.

As part of your background research, you decide to do an ethnographic study of work practices in an optometrist's office, focusing on interactions between the optometrist and a salesperson.

What questions would you ask?

(Start at 7 min)



Example Studies



- Methods?
- Data?
- Findings?

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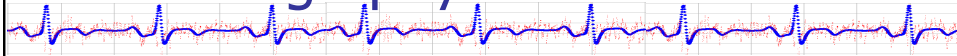
Example Studies

- Methods?
- Data?
- Findings?



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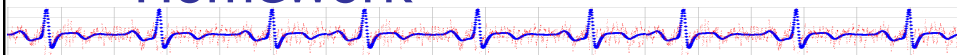
Ethnography Homework



- Goal: idea to make a library space more effective and/or efficient
 - Pick a location where talking is acceptable and spend an hour people watching with a notebook and pencil.
 - Identify an activity you find interesting.
 - Watch several people do it.
 - Interview two or more about it.
 - Don't forget to obtain verbal consent!
- Write it up.
 - Be as detailed as possible.

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Homework



- Read B&A Ch 4
- Do Homework I2a (due 1/30)

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