CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 03:
Contextual Inquiry
and Design Research

Tuesday / Thursday
12:00 to 1:20

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PAUL G. ALLEN SCHOOL
OF COMPUTER SCIENCE & ENGINEERING

Amazing Color Changing Card Trick

Why did I show you that?

Why did I show you that?

If we are focusing on the wrong thing,
we can completely miss other important things

Assumptions and pre-conceptions
play a huge role in how we focus our attention

Today is about this danger when understanding
the context for which you design technology

“You Are Not the Customer”

Seems obvious, but…

- You have different experiences
- You have different terminology
- You have different ways of looking at the world

Easy to think of self as typical

Easy to make mistaken assumptions

Today

Administrative

- Project Status
- Denny 303 on Tuesday 10/10

Contextual Inquiry and Design Research

- Ethnographic Principles
- Contextual Inquiry Principles and Practice
- Additional Design Research Methods

Project Team Formation

Project Status and Assignments

Team Formation Today

- Reading 1 Due Today
- Team Ideation in Section Tomorrow

Looking Forward

- 2b: Design Research Plan due Monday 10/9
- 2c: Design Research Check-In due Thursday 10/12
- 2d: Design Research Review due Monday 10/16

Denny 303 on Tuesday 10/10

Objectives

Be able to:

Enumerate and describe ethnographic principles.

Describe master/apprentice relationship in contextual inquiry, contrast it to other relationships with a participant.

Enumerate and describe contextual inquiry principles.

Describe stages of a contextual inquiry, including withdrawal and return.

Give examples of other design research methods, be able to consider how they might be applied to different design research needs.

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Ethnography

Emerged in 1920s as a new anthropology method, exploring why groups think and act as they do

Learn local language, record myths, customs, and ceremonies in much greater detail than prior work

You will likely never perform an ethnography

Ethnography

Traditional science attempts to understand a group or individual objectively

- Understand the subject of study from the outside in a way that can be explained to “anyone”

Ethnography attempts to understand a group or individual phenomenologically

- Understand the subject of study as the subject of study understands itself

Four Ethnographic Principles

Natural settings

Holism

Descriptive

Member point-of-view

Four Ethnographic Principles

Natural Settings

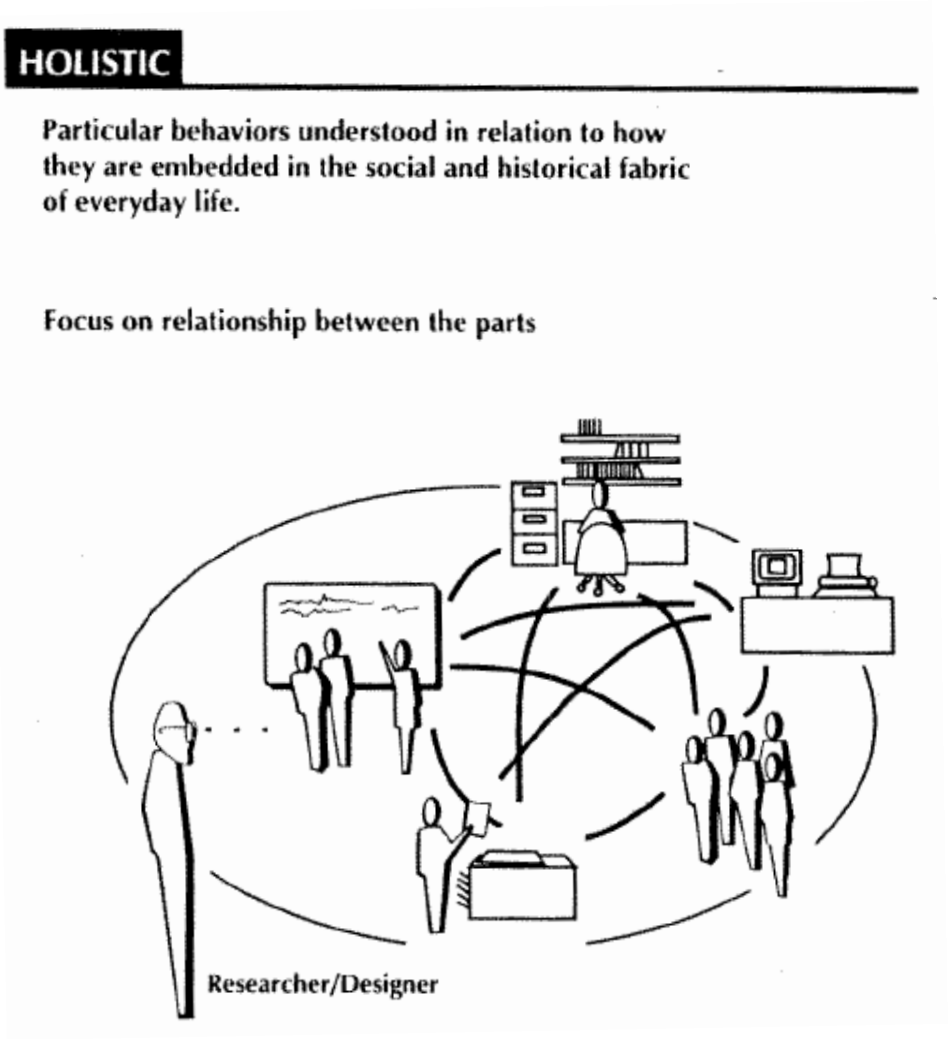
- Conducted in the setting of the participant
- Focus on naturally occurring, everyday action
- Cannot use laboratory, experimental settings, or a phone call to gather this type of data

You really do have to go out there and see it

Four Ethnographic Principles

Holism

Behavior can only be understood in its larger social context; that is, holistically.

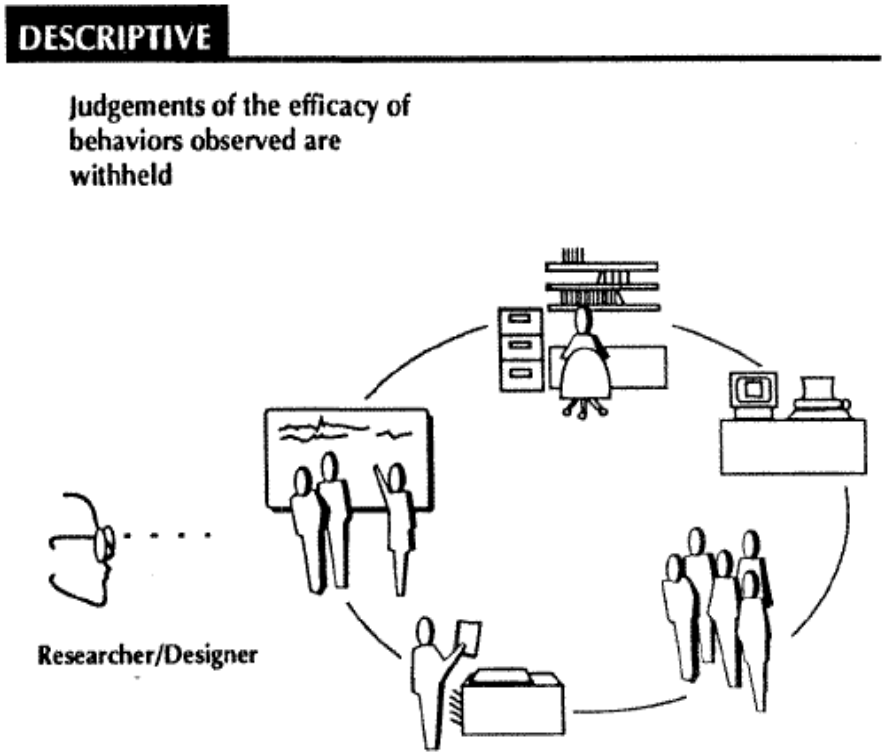


Four Ethnographic Principles

Descriptive

Study how people actually behave, not how they ought to behave.

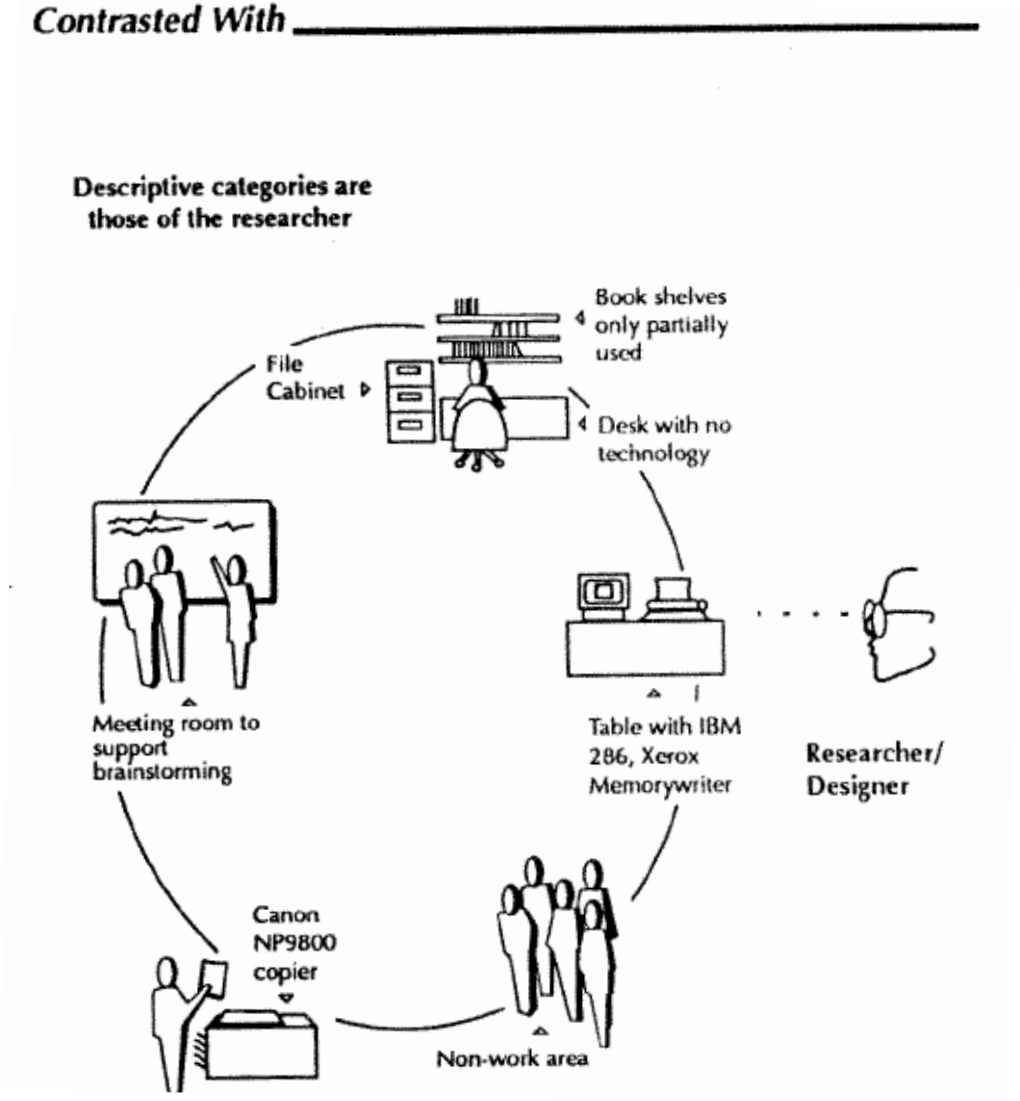
Defer judgment.



Four Ethnographic Principles

Member
Point-of-View

See through participant eyes in order to grasp how they interpret and act in their world.



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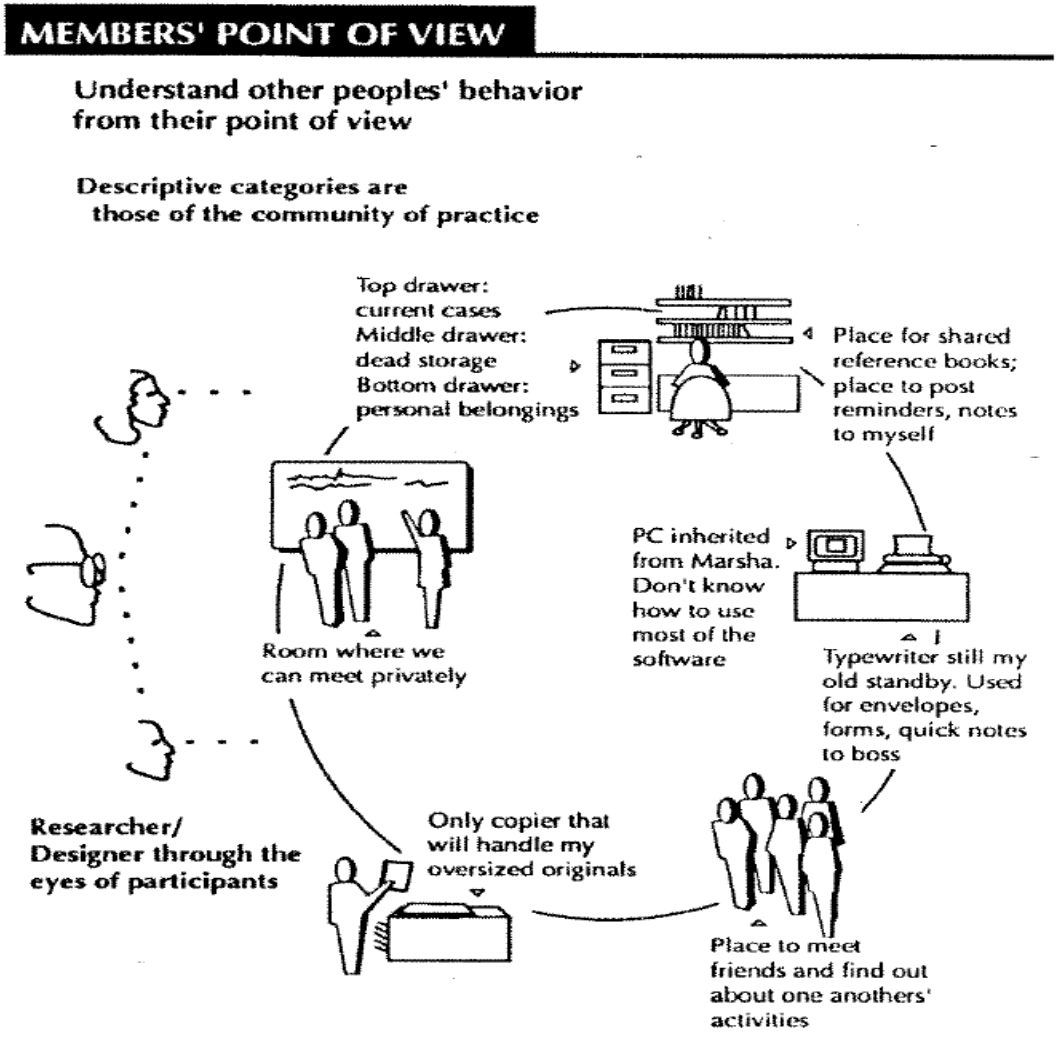

Design Ethnography

Quicker than traditional ethnography

- Days, weeks, or months, not years

Sometimes “concurrent ethnography”

- The ethnography is being done
  at the same time that design is under way

Goal is to generate insights informing design

- Sometimes “ethnographically inspired methods”

Translating from raw field observation
to design ideas can be a difficult process

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Contextual Inquiry

Applied design ethnography

“The core premise of Contextual Inquiry is very simple: go where the customer works, observe the customer as he or she works, and talk to the customer about the work. Do that, and you can’t help but gain a better understanding of your customer.”

Hugh Beyer and Karen Holtzblatt

User, Subject, or Participant?

Only two groups refer to their customers as “users”

In traditional science, “subjects” are “subjected to” experiments as researcher develops understanding

In ethnographically-oriented design methods, “participants” instead “participate” in helping the researcher develop understanding

This is not simple correctness, nor only about respect, it is a mindset that matters for being open

What is your relationship?

In a scientist/subject relationship:

The scientist does stuff

The subject responds in some way

The scientist collects data, goes back to their office, and analyzes the data to gain understanding

This is not very appropriate for gaining phenomenological understanding

What is your relationship?

In an interviewer/interviewee relationship:

The interviewer asks a question

The interviewee responds immediately

At a pause, the interviewer asks
the next question from their list

When all the questions are answered,
the interview is complete

This would support gaining phenomenological understanding if you knew what questions to ask

Implying you have phenomenological understanding

What is your relationship?

In a master/apprentice relationship:

- The master is doing stuff
- The master explains what they are doing
- The apprentice asks clarification questions
- The master answers

This relationship is at the heart of contextual inquiry

Master/Apprentice Relationship

Seeing the work reveals structure

- Many instances and interviews reveal the picture

Every current activity recalls past instances

> A customer describing how she learned a feature told us, "I looked it up in the documentation." But when we asked her to look it up again, she was able to show us: "I looked the function up in the index and scanned the section. I saw this icon in the margin that I recognized from the screen, so I read just this paragraph next to it. It told me all I needed to know." The documentation provided the context she needed to recover a detailed story, and the detail revealed aspects that had been overlooked—that the icon was her visual cue to the relevant part of the page.

Unique or One of Many?

"Take the attitude that nothing any person does is done for no reason; if you think it's for no reason, you don't yet understand the point of view from which it makes sense. Take the attitude that nothing any person does is unique to them, it always represents an important class of customers whose needs will not be met if you don't figure out what's going on."

(p. 63, Contextual Design)

Not Quite Master/Apprentice

The goal is not to learn to do the task

Instead, the goal is to learn how the participant does the task in order to learn how to support it

And for the researcher to enlist the participant's active assistance in understanding the task

Not Quite Master/Apprentice

In a contextual inquiry relationship:

- The participant is doing stuff
- The participant explains what they are doing
- The researcher offers an interpretation
- The participant agrees or corrects

Partners

- Not really an interview
- Not really an apprentice

Principles of Contextual Inquiry

Context

- Must be done in the setting of the participant.

Partnership

- Master/apprentice model; investigator is humble.

Interpretation

- Observed facts must be regarded for their design implications. Raw facts without interpretation are not very useful.

Focus

- Themes that emerge during the inquiry. You cannot pay attention to all facets of someone's work at all times.

Context

Go to the workplace & see the work as it unfolds

People summarize, but we want details

Keep it concrete when people start to abstract

“Do you have one? May I see it?”

Context

Imagine studying how a student writes a paper

Why not just ask?

Context

Imagine studying how a student writes a paper

Why not just ask?

May not remember details

- Getting roommate to read drafts

May skip critical difficulties

- Trouble locating references on the Web

Context

Avoid summary data by watching work unfold

We once asked a secretary how she started her day. Her answer was, "I guess I just come in and check my messages and get started." She wasn't able to go beyond this brief summary overview. It was the first thing in the morning and she had just arrived at the office, so we asked her to go ahead and do as she would any other morning. She unhesitatingly started her morning routine, telling us about it as she went: "First I hang up my coat, then I start my computer. Actually, even before that I'll see if my boss has left something on my chair. If he has, that's first priority. While the computer's coming up, I check the answering machine for urgent messages. There aren't any. Then I look to see if there's a fax that has to be handled right away. Nope, none today. If there were, I'd take it right in and put it on the desk of whoever was responsible. Then I go in the back room and start coffee. Now I'll check the counters on the copier and postage meter. I'm only doing that because today's the first of the month. . . ."

Have them think aloud..

Context

“One customer said he would not use a manual’s index to find the solution to a problem: ‘It’s never in the index.’ He could not say what led him to this conclusion, what he had looked up and failed to find. All his bad experiences were rolled up into one simple abstraction: it’s not there. But when we watched him looking things up, we could see that he was using terms from his work domain, but the index listed parts of the system.”

Context

“A customer was unable to describe
how she made her monthly report.
When asked to create it,
she pulled out her last report
and started filling in the parts.”

Context

If cannot observe, ground in an instance

Span time by replaying past events in detail

Look for holes

Ask questions to fill them

Use artifacts for context

If story has not yet ended, go back to a story that did

Customer: *When I got this problem report I gave it to Word Processing to enter online—*

(Why did she decide to give it to Word Processing? Did she do anything first?)

Interviewer: *So you just handed it on automatically as soon as you got it?*

C: *No, it was high priority, so I read it and decided to send a copy to the Claims department.*

(How did she decide it was high priority? Is it her decision?)

I: *How did you know it was high priority?*

C: *It has this green sticker on it.*

(Someone else made the decision before the report ever got here. Who and when?)

I: *Who put on the green sticker?*

C: *That's put on by the reporting agency. They make the decision about whether it's high priority and mark the report.*

(We can better pursue how the reporting agency makes the decision with them; we'll only get secondhand information from this user. Instead of trying to go further backward, look for the next missing step forward: doesn't Claims get a more personal communication than just the report?)

I: *Did you just send it on to Claims, or did you write them a note about why they needed to see it?*

C: *Oh, I always call Claims whenever I send them one of these reports.*

Partnership

Traditionally, interviewer has too much power

- You do not know what will turn out to be important

Apprenticeship model tilts power back too far

- You are not there to learn the skill

Interviewer should create a partnership

- Alternate between watching and probing

Withdrawal and Return

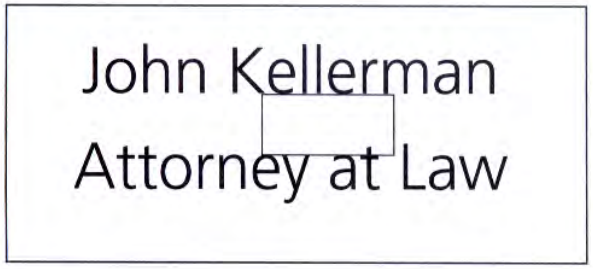
Key in partnership

Researcher observes action that indicates something meaningful

The researcher asks about this, and the pair withdraw from the task

Discuss the question

Then return to the task



In one interview with a user of page layout software, the user was positioning text on the page, entering the text and moving it around. Then he created a box around a line of text, moved it down until the top of the box butted the bottom of the line of text, and moved another line of text up until it butted the bottom of the box. Then he deleted the box.

Interviewer: *Could I see that again?*

Customer: *What?*

I: *What you just did with the box.*

C: *Oh, I'm just using it to position this text here. The box doesn't matter.*

I: *But why are you using a box?*

C: *See, I want the white space to be exactly the same height as a line of text. So I draw the box to get the height.* (He repeats the actions to illustrate, going more slowly.) *Then I drag it down, and it shows where the next line of text should go.*

I: *Why do you want to get the spacing exact?*

C: *It's to make the appearance of the page more even. You want all the lines to have some regular relationship to the other things on the page.*

Partnership

Do not squash design ideas if they arise

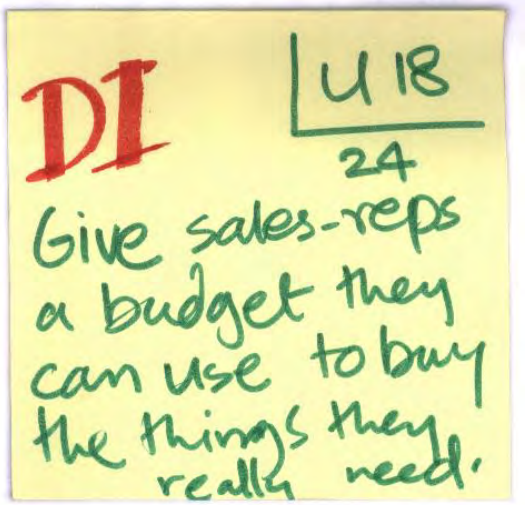
This is design, not dispassionate science

Get instant feedback

If it works, you understand the work practice and have a solution

If it fails, you can improve your understanding of the work

Find the issues behind design ideas



Partnership

Avoiding Other Relationship Models

Interviewer / Interviewee

- You are not there to get a list of questions answered

Expert / Novice

- You are not there to answer questions

Guest / Host

- Move closer, ask questions, be nosy

Interpretation

- Chain of Reasoning
  - Fact, Hypothesis,
    Implication for Design, Design Idea
- Design is built upon interpretation of facts
  - Design ideas are
    end products of a chain of reasoning
  - So interpretation had better be right
- Share interpretations with users to validate
  - Will not bias the data
  - Teaches participant to see structure in the work

Interpretation

Instead of asking open ended questions…

- “Do you have a strategy to start the day?”
- “Not particularly.”

… give participants a starting point

- “Do you check urgent messages first, no matter where they are from?
- “Actually, things from my boss are important, because they are for me to do. Messages or faxes may be for anybody.”

Participants fine-tune interpretations

- Probe contradictions until assumptions fit

Interpretation

Non-verbal cues can confirm or negate

Yes and Nos

- “Huh?” – way off
- “Umm, could be” – probably no, just being polite
- “Yes, but…” or “Yes, and” – depends what follows

Commit to hearing what people actually say

- Most have not ever had people actually pay careful attention to what they are doing

Focus

Everybody has a focus, you cannot prevent it

- Entering focus
- Project focus

Because you will have a focus, be mindful of that focus and use it to your advantage

Brainstorm and define your focus

Focus

- Focus defines the point of view
  - Clear focus steers the conversation
  - Everyone in the team has an entering focus
- Focus lets the interviewer sees more
  - Focus reveals detail
- Focus conceals the unexpected
  - Focus on one, and lose the other
- Start with a focus and then expand

Focus

Opportunities to expand focus:

Surprises, contradictions, idiosyncrasies

- Nothing any person does is for no reason

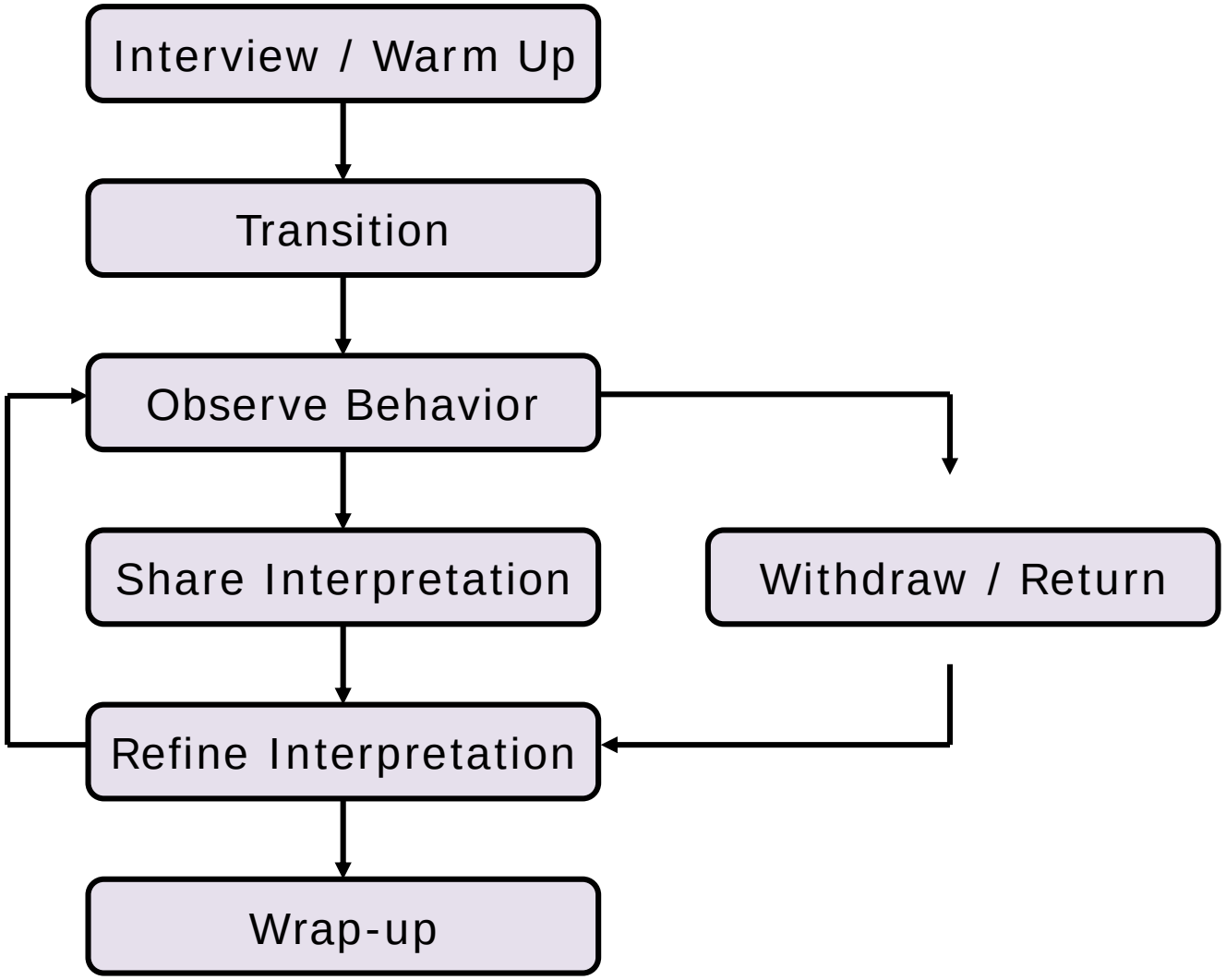
Nods

- Question assumptions even if they match
  "Do they really do that? Why would they do that?"

What you do not know

- Treat interview as an opportunity to learn new stuff
- Even if the participant is not knowledgeable, extent of their knowledge / misinformation can be useful

The Stages of a Contextual Inquiry



Explain the Rules

Be sure you explain “the rules” of how you’ll be interacting during the contextual inquiry

If this isn’t completely clear, the encounter may devolve into a traditional interview (since this relationship is more familiar to people)

How to Screw it Up

Slipping into abstraction

- Keep it concrete, in the work, in the details

Not being inquisitive or nosy enough

- If you have the impulse to ask, do it right away

Being too pushy with interpretation

- If you ignore corrections, participant will shut down

How to Screw it Up

With the wrong person

- They need to be willing to partner with you

Turning it into a regular interview

- If you could have done it in a coffee shop, then you did not do a contextual inquiry

Multiple people present

- Can be good if they talk, surface their thoughts
- Bad if they do not talk, are not forthright

How to Screw it Up

- Overly disrupting the task
  - If you change the task, your data is less useful
  - Withdrawal and return, maybe on a schedule
  - Retrospective methods might be necessary
  - (e.g., going through artifacts, prior critical incident)
- Being stuck in your focus
  - Important to have a focus,
    expectations of what you expect to be important
  - But you learn by attending to misconceptions

When All Else Fails

Remember Master/Apprentice

Remember Context

Remember Withdraw & Return

Affinity Diagrams

Generated during group session

Each observation, idea, note to a post-it

Notes are hierarchically organized into themes, based on project focus

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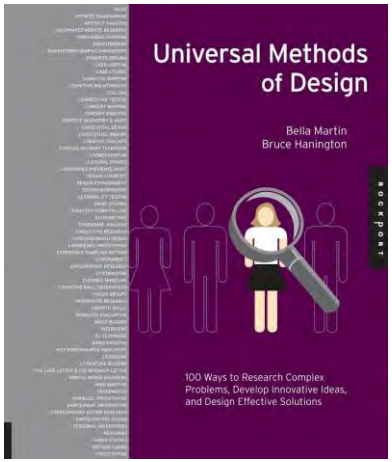
Many Design Research Methods

Many other design research methods are available, with different strengths

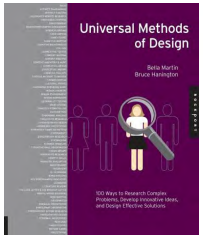


Often apply multiple methods for complementary perspectives

Fundamental goal remains to gain design insight through improved understanding of problems

Interviews

Method 48



Similar to contextual inquiry,
but lacking context of direct observation

- Set a focus, record, take notes, have two people

Can be Structured / Semi-Structured

- Avoid leading questions

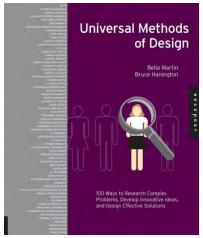
Interpret responses

- Repeat and rephrase, probe terms and concepts
- "can you give an example", "tell me more",
  "what do you mean", "why was that important"
- Ask when it did not happen as expected

Pair with questionnaires for depth / to humanize

Focus Groups

Method 43



Moderated conversation among peers

- Moderator helps establish this, participants share experiences, wants/needs

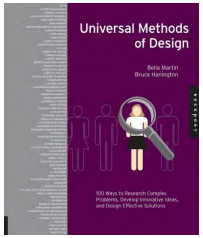
Researcher benefits from their conversations

Prompts discussion topics

- Explanations of problems in status quo
- Underlying emotions in a process
- Desires / disagreements for new designs

Diary Study

Method 30



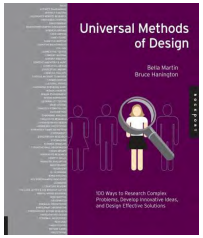
Participants keep a diary

- Possibly as primary data
- Possibly to create mindfulness before interview

timeout

Diary Study

Method 30



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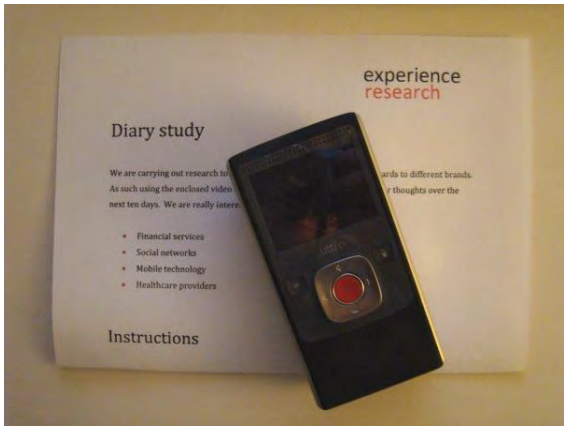
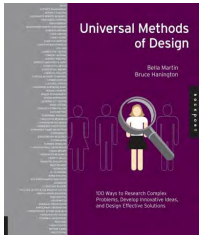


Diary Study

Method 30



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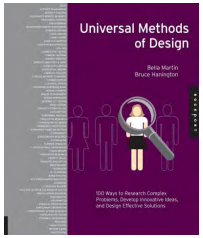
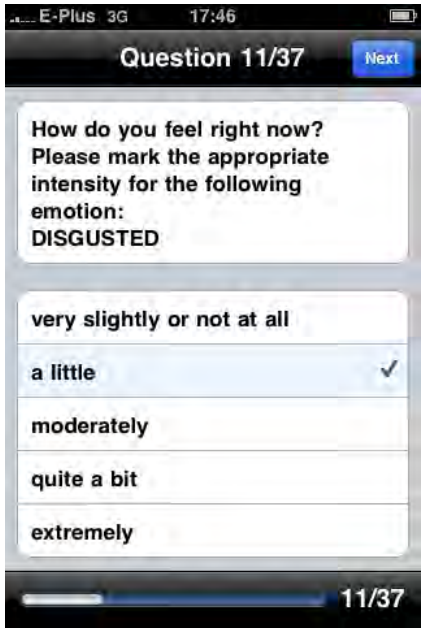
Experience Sampling

Method 37



Emerges from “beeper study” method

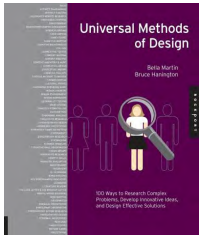
- Can be random, can be context-aware
- Can gather self-report, photos, sensor data



Many Design Research Methods

Personal Inventories

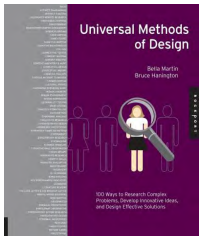
Method 62



"collections of artifacts
selected by the participant"

Cultural Probes

Method 24



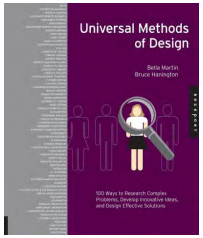
"materials designed to inspire
people to thoughtfully consider
personal context and circumstance"

"maps … asked the elderly to mark zones for
meeting others, being alone, dreaming…"

Many Design Research Methods

Behavior Mapping

Method 06

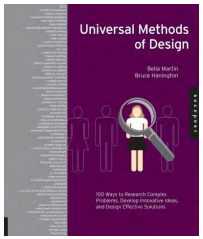


"place-centered mapping"

"individual-centered mapping / traces"

Graffiti Wall

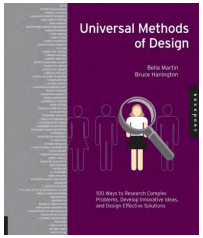
Method 45



"candid feedback on behaviors and perceptions of current spaces"

Shadowing

Method 76



"observational method that involves tracking somebody in their role"

> "not intended to be covert … however subtle instances might be completed in public spaces …"

Useful reminder to be thoughtful and safe

> multiple groups have been asked to leave
>
> be safe, be mindful of people

Value Sensitive Design

To be useful or usable is not the same as supporting important human values

Examples?

Value Sensitive Design

To be useful or usable is not the same as supporting important human values

Examples?

Independence
Privacy
Trust
Accountability
Ownership and Property

Fairness
Freedom from Bias
Human Safety
Universal Access
Sustainability

Value Suitabilities

Value Sensitive Design is an interactional theory

- Values are not inherent in a given technology
- But a technology is not value neutral

- Some technologies are more suitable than others for supporting given values

Value Sensitive Design investigates stakeholders, values, and value suitabilities

- Direct and indirect stakeholders

Tripartite Method

Conceptual Investigations

- Analyses of the values involved in a system

Technical Investigations

- Identify or develop technical mechanisms
- Investigate suitability to support values

Empirical Investigations

- Investigate who the stakeholders are, which values are important to them, and how they prioritize these values

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CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 03:
Contextual Inquiry
and Design Research

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12:00 to 1:20

James Fogarty
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