Human–Computer Interaction

Qualitative Research

Professor Bilge Mutlu

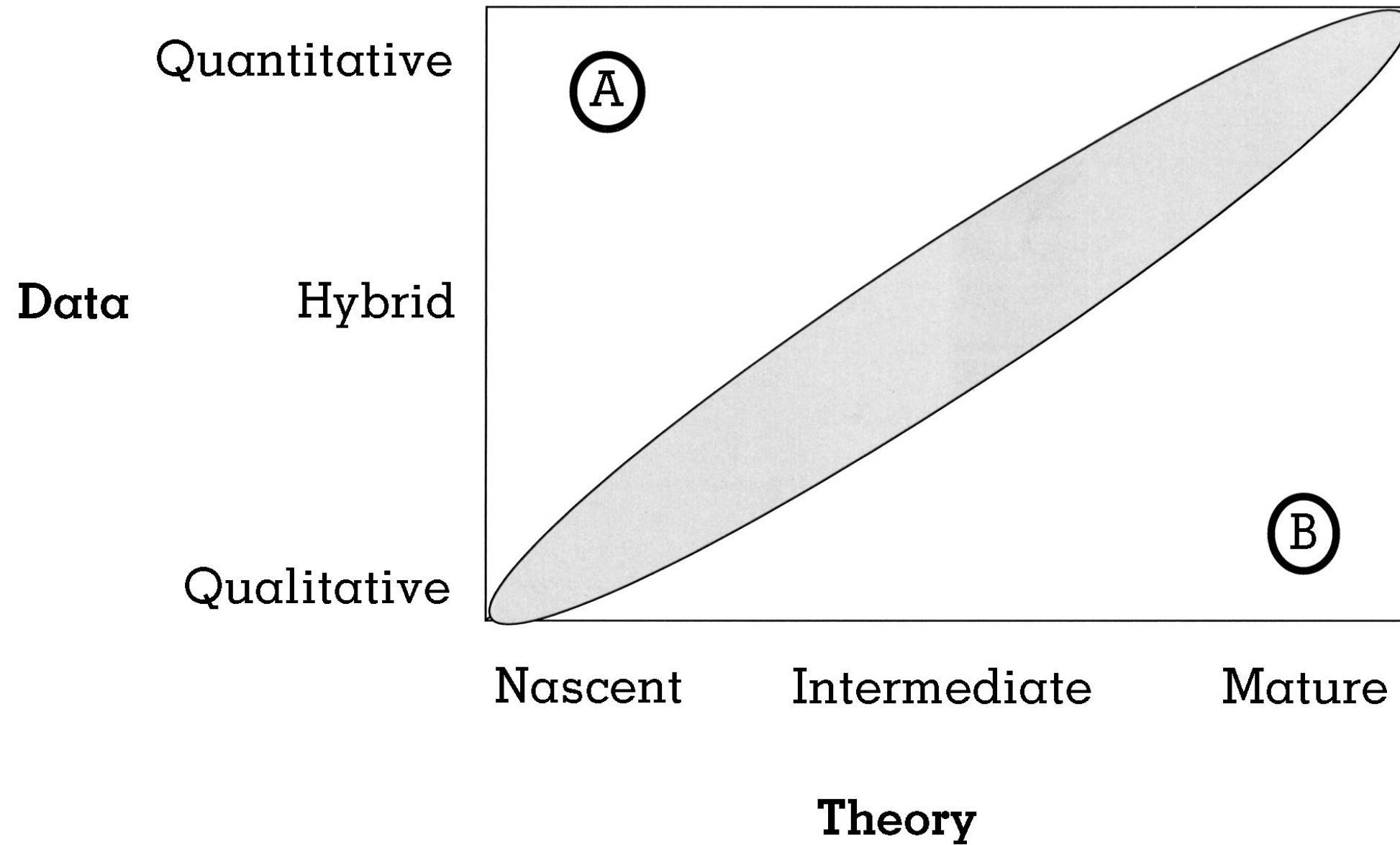# Questions

To ask questions during class:

» Go to <u>slido.com</u> and use code **#2938904** or
   <u>direct link</u> or scan QR code

» Anonymous

» I will monitor during class

What do we do in the following situations?

1. Theory is nascent in an area

2. If you would like to take a fresh look at a mature topic

[1] Edmondson & McManus, 2007, Methodological fit in management field research

We use qualitative research methods.

1. Narrative (Inquiry)

2. Phenomenology

3. Grounded Theory

4. Case Study

5. (Participatory) Action Research

6. Ethnography

1. Narrative (Inquiry)[2]

Definition: A qualitative research method involving studying one or two individuals, gathering data through collecting their stories, reporting individual experiences, and chronologically ordering the meaning of those experiences.

Originates primarily from the humanities, e.g., literature, history, anthropology, sociology, sociolinguistics, and education.

Utilizes individual "stories" (told/journaled) and various other resources (documents, photos, historical accounts) and presents individual stories in chronological representation.

---

[2] Creswell et al., 2007. Qualitative research designs: Selection and implementation

3

Meaning can be as important as usability in the design of technology.

BY KRISTEN SHINOHARA AND JOSH TENENBERG

A Blind Person's Interactions with Technology

CURRENT PRACTICE IN computer interface design often takes for granted the user's sightedness. But a blind user employs a combination of other senses in accomplishing everyday tasks, such as having text read aloud or using fingers along a tactile surface to read Braille. As such, designers of assistive technologies must pay careful attention to the alternatives to sight to engage a blind user in completing tasks. It may be difficult for a sighted designer to understand how blind people mentally represent their environment or how they apply alternative options in accomplishing a task. Designers have responded to these challenges by developing alternative modes of interaction, including audible screen readers,[11] external memory aids for exploring haptic graphs,[20] non-speech sounds for

navigating hypermedia,[16] two-finger haptic interfaces for touching virtual objects,[22] haptic modeling of virtual objects,[13] and multimodal (auditory, haptic, visual) feedback for simple computer-based tasks.[10] The effectiveness of these alternative modes of interaction is studied primarily through a usability framework, where blind and visually impaired users interact with specific devices in a controlled laboratory environment. These developments in assistive technology make a point to take advantage of the alternative modes of interaction available to blind users.

Physical obstacles are not the only considerations affecting interaction between blind users and everyday artifacts. As we found in this study, elements of meaning, such as socialization, efficiency, flexibility, and control, strongly influence the use of both digital and non-digital artifacts by blind users. Taken-for-granted factors, such as an individual's social ties or busy schedule, might determine whether and how an object is used. Therefore, designers may need to pay close attention to the external factors that influence an individual's choice and use of technology. Conversely, and equally as important, designers must also consider how an individual's internal values and desires affect their technology preferences.

The study described here is an in-depth exploratory and descriptive case study[24] of a blind individual using various technologies in her home. Previous studies in lab settings compared interactions against a set of heuristics or with a control group, allowing researchers to isolate events in order to understand how users interact with specific technologies on a narrow range of tasks. We took this study out of the lab and into the home to get a better sense of the nuances of everyday life influencing how a blind user interacts with technology. It differs from the usability approaches in several ways. First, we wanted to look across a range of technologies for common kinds of task failure and workarounds, rather than on a single technology or task. Second, because emerging technologies involve a choice of what to place in hardware and what to place in software, such as whether to have physical or virtual buttons on a cellphone, we wanted to investigate user interaction with both digital and physical objects to better understand the trade-offs in hardware vs. software design choices. Third, the investigation was situated within the individual's home rather than in the laboratory to better understand artifact use in a naturalistic setting. And fourth, our interviews concerned not only usability but aesthetics, affect, meaning, historical associations of use in context, and envisioning of future technologies. Overall, we were concerned about what technologies were most valued and used, when they were used and for what purpose, the difficulties experienced in their use, the workarounds employed, and the meanings

BrailleNote from HumanWare; http://www.humanware.com/en-usa/home.

and interpretations associated with their use.

Without careful consideration for both the limitations in usability and the meaning of the interactions affecting blind users, sighted technology designers may unwittingly create interfaces with the wrong affordances or that are dissonant with a user's personal preferences, resulting in task failure. Already known is that the visually impaired must make alternative accommodations to accomplish the same tasks day in and day out. What is little known is how much of an influence an individual's personal values and surroundings have on the choice of where, when, and how technology is used. Observations in a user's home of interactions with existing technologies may provide insight into the way surroundings and personal preferences are drawn on to help complete daily tasks.

As we suggest in the study, the combination of functionality *and* socially situated meaning determines for the user the actual usability of a technology to accomplish specific tasks. These technologies hold meaning that affects the ways individuals understand themselves in relation to the communities to which they belong.

Background
Developing the study, we drew on a number of literatures, including in assistive technology for people with visual impairments, task breakdowns and workarounds, and design ethnography in the home:

Design ethnography. The study design reflects Clifford Geertz's view that "man is an animal suspended in webs of significance he himself has spun."[8] Significance is constructed not only from behavior and discourse, but in the materials with which people interact. Many are mundane objects—measuring cups, cellphones, sticky notes.

---

3 Shinohara & Tenenberg, 2009, A blind person's interactions with technology

© Human–Computer Interaction | Professor Mutlu | Week 04: Methods: *Qualitative research*   7

2. Phenomenology

Definition: The study of the shared lived experiences of individuals that focuses on a particular phenomenon (e.g., anger) to capture the essence of these experiences.

Philosophical roots in Husserl, Heidegger, Sartre, Merleau-Ponty.[2]

Utilizes interview data, systematic reductive analyses, and generating textual statements of the essence of the experience.

---

[2] Creswell et al., 2007. Qualitative research designs: Selection and implementation

3. Grounded Theory

Definition: A qualitative research design in which the inquirer generates a general explanation (a theory) of a process, action, or interaction shaped by the views of a large number of participants.[2]

Primarily utilizes interview data and, through a systematic, analytical process, constructs a theoretical model of phenomena.

Two forms: *classsical*[4] and *constructivist*[5] — "found" vs. "constructed" stories.[6]

---

[2] Creswell et al., 2007. Qualitative research designs: Selection and implementation

[4] Strauss & Corbin, 1990, Basics of qualitative research

[5] Charmaz & Belgrave, 2007, Grounded theory

[6] O'Conner et al., 2018. An Exploration of Key Issues in the Debate Between Classic and Constructivist Grounded Theory

4. Case Study

Definition: A case study is an approach in which (a) one case (single case study) or a small number of cases (comparative case study) in their real life context are selected, and (b) scores obtained from these cases are analysed in a qualitative manner.[7]

Forms of case studies: *exploratory*, *descriptive*, *explanatory*.[8]

Utilizes documents, archival records, interviews, direct observations, participant observations, and physical artifacts.

---

[7] Dul & Hak, 2007, Case study methodology in business research

[8] Yin, 2003, Case study research; designs and method

5. (Participatory) Action Research

Definition: A qualitative research inquiry in which the researcher and the participants collaborate at all levels in the research process (participation) to help find a suitable solution for a social problem that significantly affects an underserved community (action).[2]

Involves participatory and collaborative reflection of people's relationships with other people or social structures.

---

[2] Creswell et al., 2007. Qualitative research designs: Selection and implementation

6. Ethnography

Definition: Ethnographic research projects use deep immersion and participation in a specific research context to develop an understanding that would not be achievable with other, more limited research approaches.[9]

Roots in anthropology and sociology, adopted by fields such as HCI.

Utilizes observation and interview data and systematic analyses to construct new understanding and theory.

---

[9] Lazar et al. (2017). Chapter 9: Ethnography. Morgan Kaufmann.

*How do we conduct an **ethnography**?*

Where do we start?

1. Identify a domain where theory is *nascent* and where new theory can have great impact

2. Developing a general *research question* and focus that can be updated

3. Find a *setting* to study the phenomena of interest from this domain

4. Conduct *fieldwork* where we ask the question: *What is going on here?*

What is a setting?

Definition: A site where the phenomena of interest can be observed.

What is fieldwork?

Definition: An organic process where data *collection* and *analysis* develop symbiotically and becomes increasingly more focused over time.

» Obtaining access to the site, informed consent

» Identifying *stakeholders*, choosing a *role*

» Discovering groups, situations for comparison

» Writing up detailed *fieldnotes*

Data collection

Analysis

New questions

Revised models
and theories

Convergence on
validated model
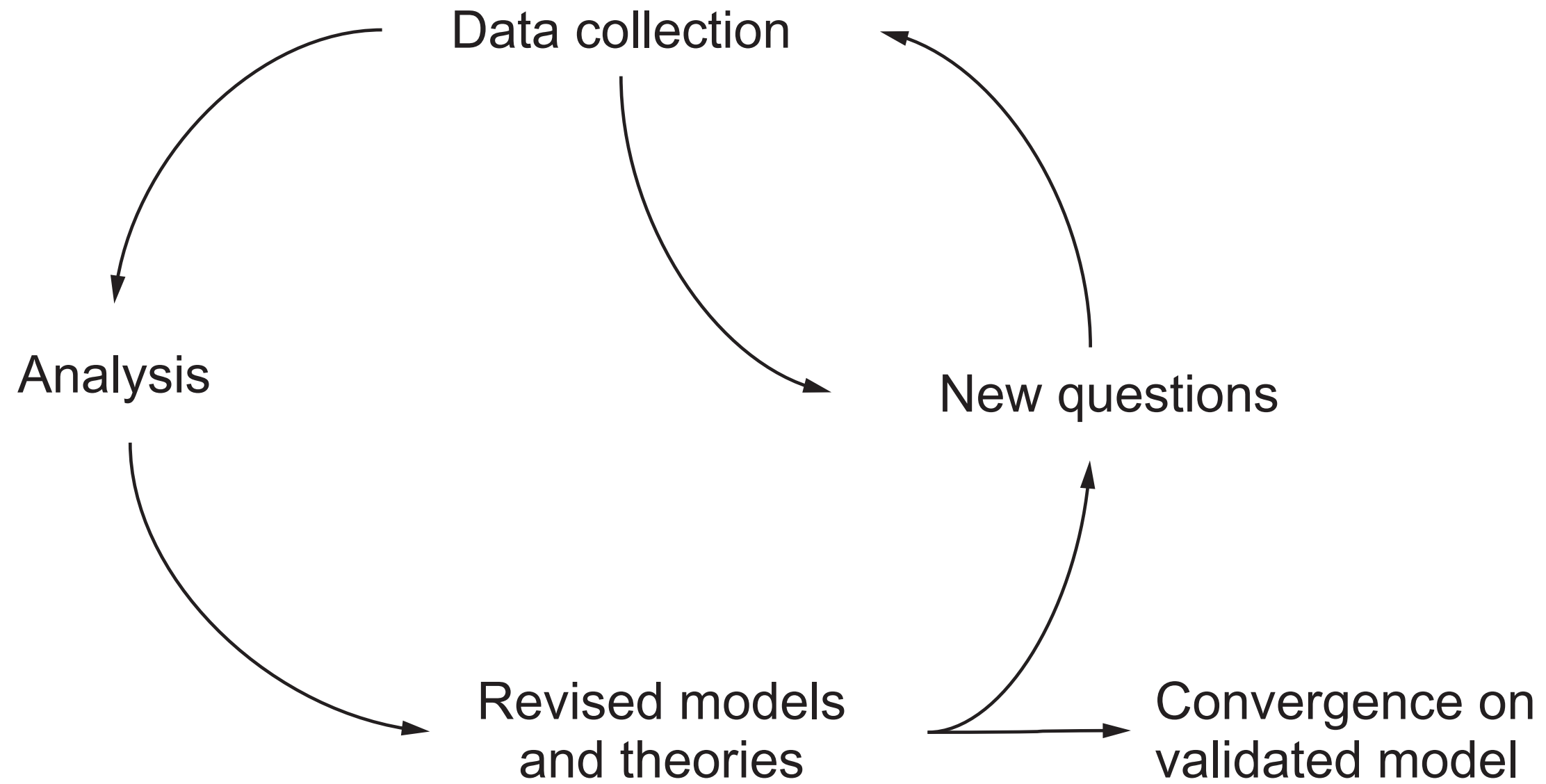
[9] Lazar et al. (2017). Chapter 9: Ethnography. Morgan Kaufmann.

How do we collect data?

1. Fly-on-the-wall observations

2. Participant observation

3. Interviews

Fly-on-the-wall Observation

Definition: Observing social interactions in the setting without influencing the context in order to gain familiarity with the physical and social context of the study.

Produces *fieldnotes* of observations that can be captured in written, audio, or video form.

© **Human-Computer Interaction | Professor Mutlu | Week 04:** Methods: *Qualitative research*
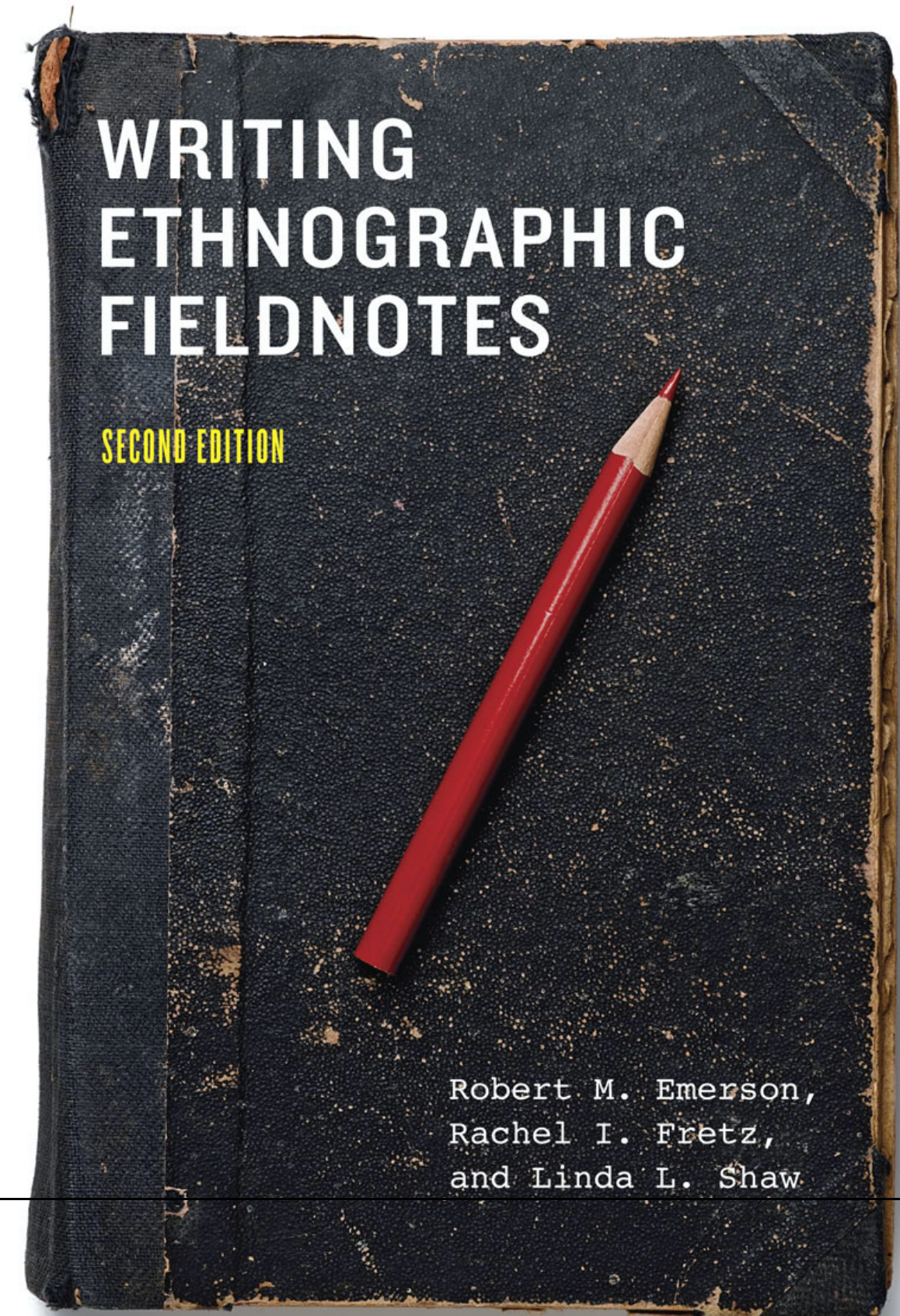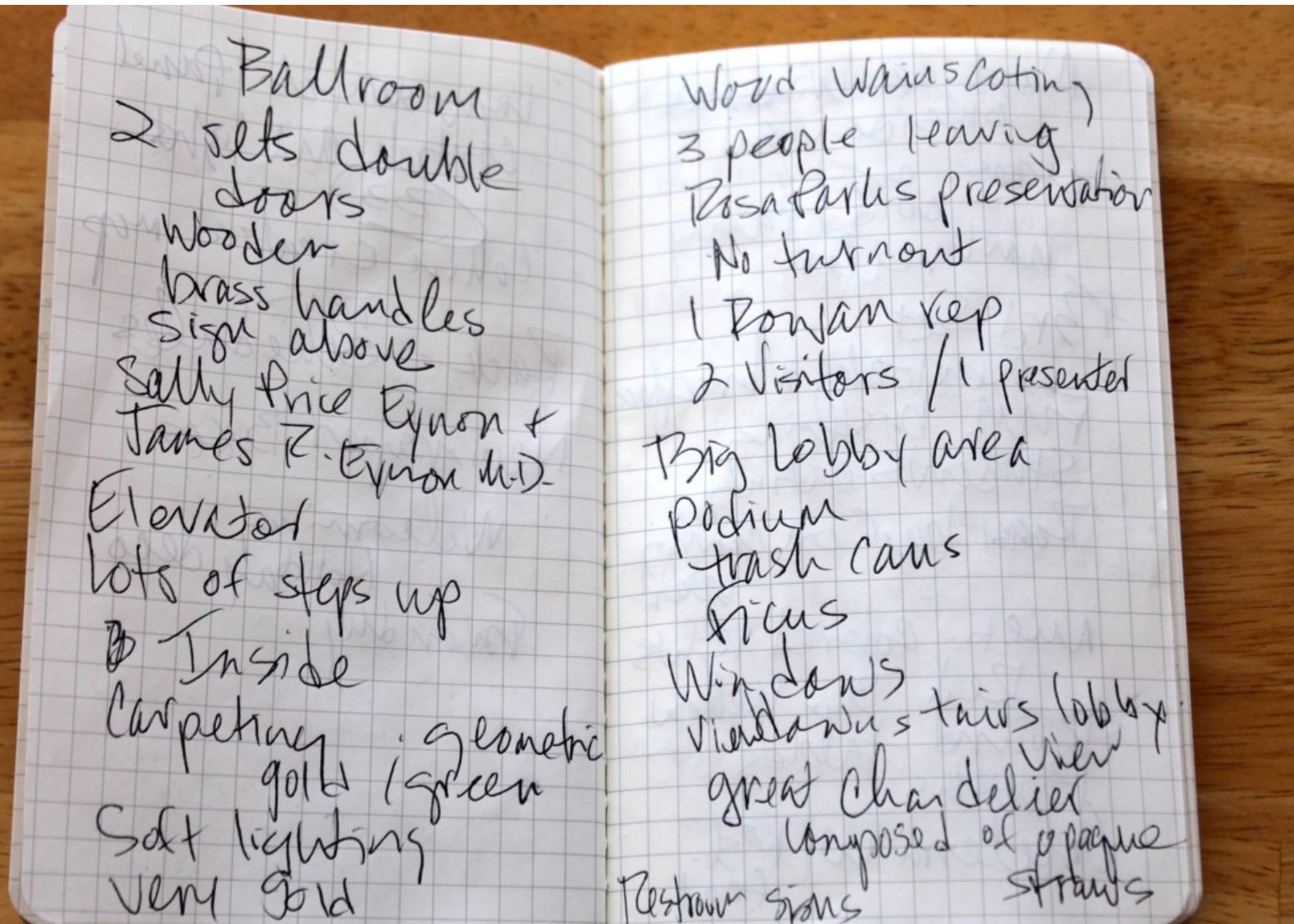
Participant Observation

Definition: Gaining an in-depth understanding of how the stakeholders in the setting interact with each other by participating in the activities that take place at the setting.

Produces *fieldnotes* of observations and personal reflections that can be captured in written, audio, or video form.

Interviews

Definition: Interviewing individuals to understand their perspectives, to understand how people see their world, and to validate findings from observations.

Open-ended, in-depth interviews with follow-up from observations and further probing.

Involves studying spoken language, body language, and coded speech.

Produces *transcripts* captured in written, audio, or video form.

What kind of data should I collect?

» Fieldnotes should capture everything observed and heard, researcher interpretations, including what one could not observe or understand.

» Audio/video recording is acceptable within limits. Transcription and reflection should happen immediately before interpretations are lost. Audio is recommended over video.

» Retrospective capture of field notes and interpretations should take place immediately.

» Photos can provide useful visual context to observations and interpretations.

Can I conduct an ethnography on the Internet?

Yes, the same methods can be used to study online behavior in social media, forums, gaming platforms, etc.

Studying behavior online brings up complex ethical questions.

Experimenter effect can be particularly strong.

What are some examples?

Some Well-known Ethnographies[11]

» <u>Van Maanen, 1991, *The smile factory*</u>

» <u>Barley, 1986, *Technology as an occasion for structuring*</u>

» <u>Suchman, 1987, *Plans and situated action*</u>

» <u>Grudin, 1988, *Why CSCW applications fail*</u>

» <u>Bechky, 2006, *Gaffers, gofers, and grips*</u>

[11] Compiled by Professor Sara Kiesler

Hands-on Activity

Work in pairs to perform *one* of the following options using the <u>activity handout</u>:

1. Design an ethnographic study

2. Conduct a mini ethnography

3. Conduct a mini-ethnography *online*

Q&A — 5 min | Activity — 30 min | Reporting — 10 min