QUALITATIVE METHODS FOR GATHERING REQUIREMENTS

OUTLINE

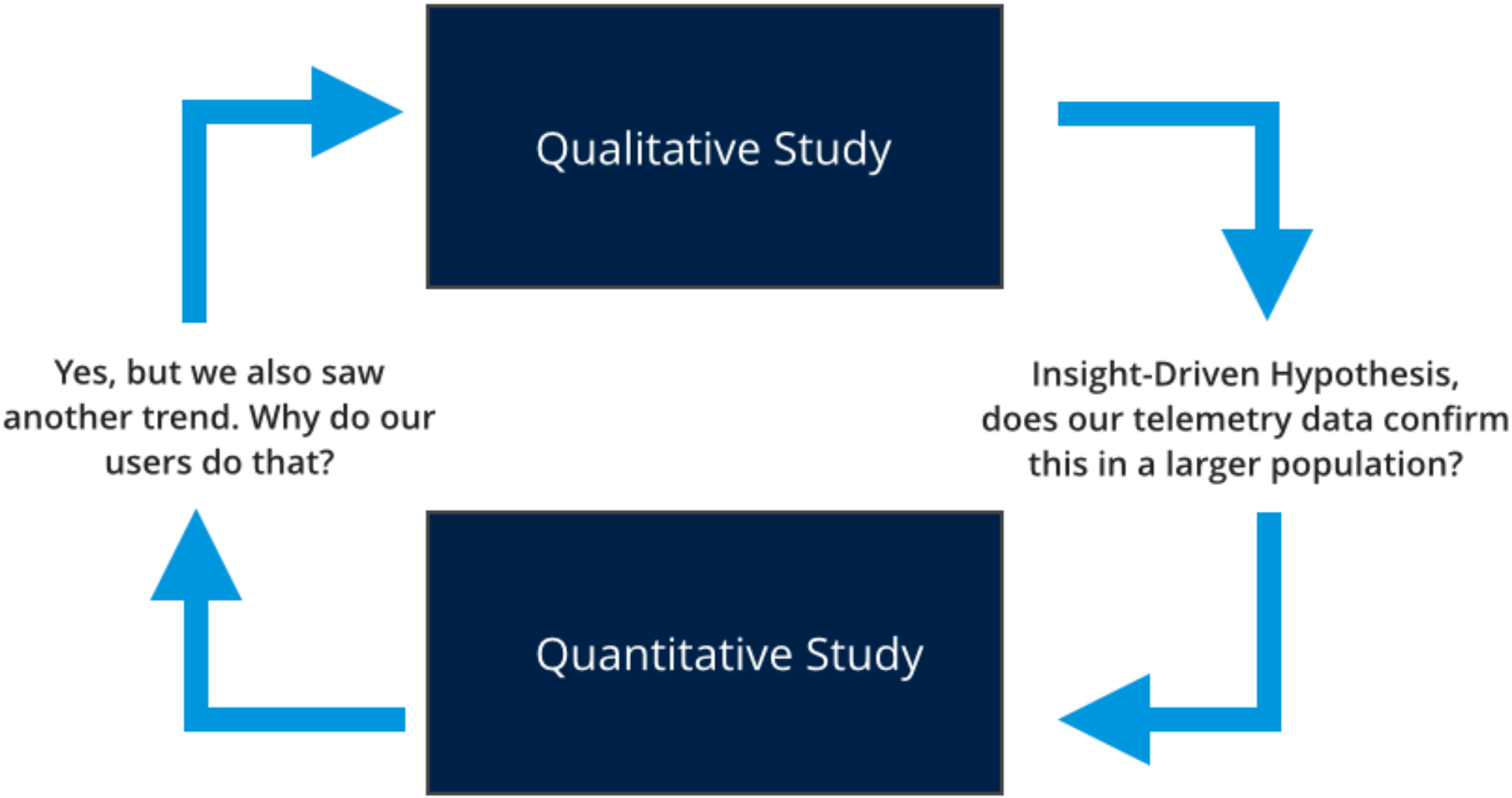
- **Introduction**

- **Qualitative User Studies**
  - In-depth Interviews
  - Qualitative Observations

INTRODUCTION

Quantitative	vs.	Qualitative
numbers	**Based on**	opinions and experiences
Larger sample	**Participants**	Smaller sample
Surveys, observations	**Techniques**	In-depth interview, focus groups, observations
% of people agreed with a statement	**Results**	In-depth analysis/summary
Mostly closed questions	**Format**	Open ended questions

INTRODUCTION



https://blog.mozilla.org/ux/2014/10/why-do-we-conduct-qualitative-user-research/

VerdezotoDiasN@Cardiff.ac.uk

QUALITATIVE USER RESEARCH

http://sociology.about.com/od/Research-Methods/a/Interviews.htm

http://sociology.about.com/od/Research/a/Participant-Observation.htm

https://www.interaction-design.org/literature/article/how-to-conduct-focus-groups

In-depth Interviews

Participant Observations

Focus Groups

WHY QUALITATIVE METHODS?

- **Revealing new insights**
- **Understanding experience or situations**
- **Generating ideas and hypotheses**

OPEN-ENDED QUESTIONS

Advantages vs. Disadvantages

- Unlimited number of answers
- Respondents can qualify, and clarify responses
- Can find the unanticipated

- Respondents give answers with different level of details
- Answer can be irrelevant
- Forgetful or inarticulate respondents
- Coding responses is subjective and tedious
- More time and effort

IN-DEPTH INTERVIEWS

Goal: Understand how people perform their jobs?

- Tell me about your job? -> Too general

Vague questions -> Vague answers

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Vague questions -> Vague answers

Trick: To get **specific** information -> ask for information that illustrate important **aspects** of the work/activity/situation

PLANNING INTERVIEWS

Goal of Interviews:

- Capture elements of **experience** or **attitudes** that are relevant to the research question (e.g., what do you want to find out)

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Research Question

- Can you get the information by **talking** to people?
- … drawing in their own **experiences** and **beliefs**? (rather than speculating or giving their opinions)

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Research Question

- Can you get the information by **talking** to people?
- … drawing in their own **experiences** and **beliefs**? (rather than speculating or giving their opinions)

You will need:

- Carefully designed interview questions
- A carefully chosen sample
- A rigorous approach to analysis

DESIGNING AN INTERVIEW

- Do **NOT** just ask the research question!
  - Design questions that enable you to address it

- Social encounter -> **natural** discussion
  - Short, to the point, using familiar language
  - Not leading; open, as unbiased as possible
  - Open-ended
  - Open to **description** and **detail**
  - Grounded in **real** examples

STRUCTURE OF AN INTERVIEW

- Start **simply**
  - E.g., demographic or simple questions
- Build a structure that cover all the **main points**
  - Control the direction of the interview
  - Support flexibility
- Support **Narrative flow** by:
  - Grouping related questions
  - Using prompts to follow up on each one
- Close with **thanks** and an opportunity to follow up

EXAMPLES

First Target Group Session
Determining Self-Tracked Parameters

What I want to find out:

- What apps the users have used in the past
- Suggestions on features that might be useful
- Parameters that they wanted to track but couldn't due to no available apps
- Various other bits of information that could help me make a decision about which self-tracking modules to implement

Questions:

- What self-tracking applications have you used in the past?
- How often do you use these apps?
- What parameters did you track with these apps? Did you, for example, track how much calories you consumed daily?
- Why did you track these parameters?
- Did you gain any valuable insights by using these apps?
- If yes, what insights?
- If not, why?
- Is there any functionality which you would find useful that these apps don't have?

[Up to this point, the target group might have pointed to a sparse set of parameters. To be able to narrow down their feedback, I will ask them what parameters they would track to help them better assess their general health/wellbeing]

- What would you say are the most important factors affecting your general wellbeing?
- Do you think you could track these factors using a mobile app? Would you prefer to do it manually or automatically?

GET INFORMED CONSENT

Letter of Consent

I agree to participate in a project conducted by Xishuo Wang from the University of Leicester. I understand that the project is designed to gather information about electricity usage and my everyday activities. By signing this letter of consent, I understand that:

1.My participation in this project is voluntary and I am free to withdraw at any time.

2. If I feel uncomfortable in any way during the interview session or any activity during the project, I have the right to decline to answer any question or to end the interview or activity.

3. Each time the interview will last approximately 30-45 minutes. Notes will be taken during the interview. An audio tape of the interview and subsequent dialogue will be made for later analysis.

4. I agree to the use of anonymised quotes in Xishuo's dissertation. I understand that the researcher will not identify me by name in any reports using information obtained from this interview, and that my confidentiality as a participant in this study will remain secure.

Xiyuan _____ My Printed Name

_____ My Signature

25/06/16 _____ Date

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PRIFYSGOL CAERDYDD
VerdezotoDiasN@Cardiff.ac.uk

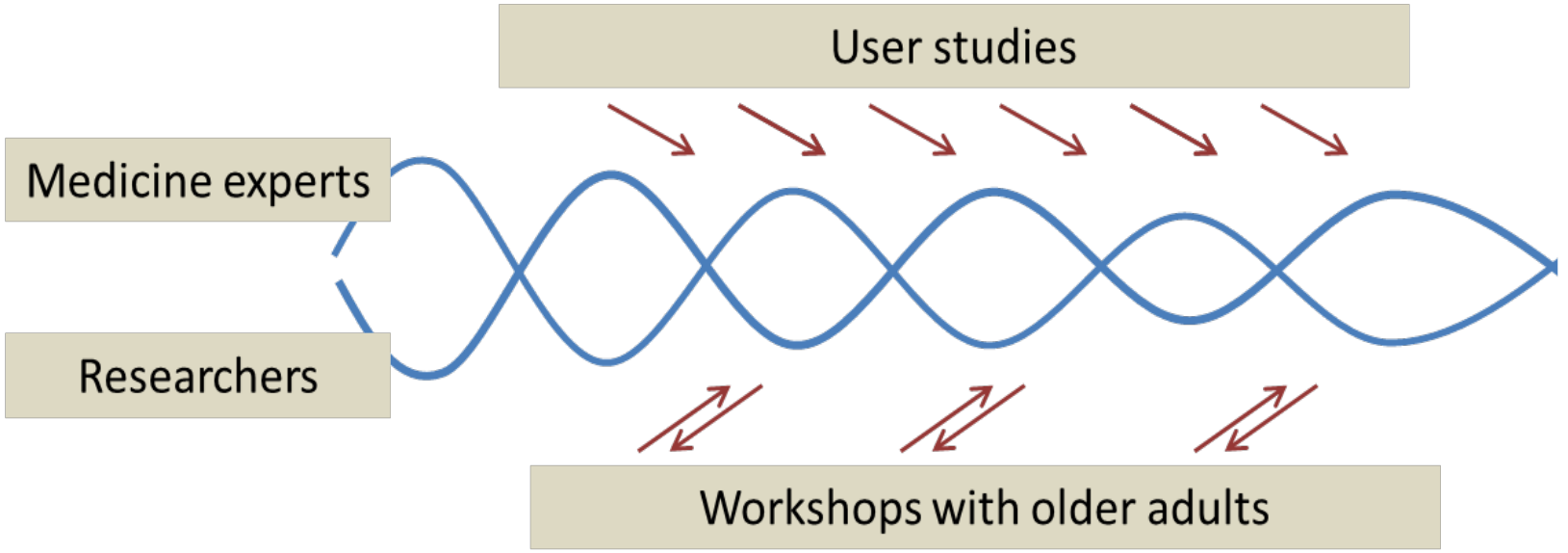
RESEARCH ETHICS

- Research with Human Participants
- Potential Ethical Issues
  - **The subject matter** e.g., controversial, sensitive, embarrassing, upsetting
  - Matters around researchers e.g., conflict of interest
- Nature of Participants
  - Children or young people under 18
  - Vulnerable people e.g., elderly, physical or mentally ill
  - Participants do not understand English

Research Integrity *Online Training Programme for Students*

https://intranet.cardiff.ac.uk/students/study/postgraduate-research-support/integrity-and-governance/training/research-integrity-online-training-programme

EXAMPLE: MEDICATION MANAGEMENT



Quantitative study

- 316 telephone interviews from 2 Danish municipalities

Qualitative Study

- 9 older adults
  - › 60-93 years old
  - › 1-32 doses a day

User-centered design process

- 7 older adults
  - › 57-87 years old
  - › 1-35 doses a day
- 7 medicine experts
  - › 2 healthcare workers & 2 doctors
  - › 2 pharmacists & 1 developer from the Shared Medication Record

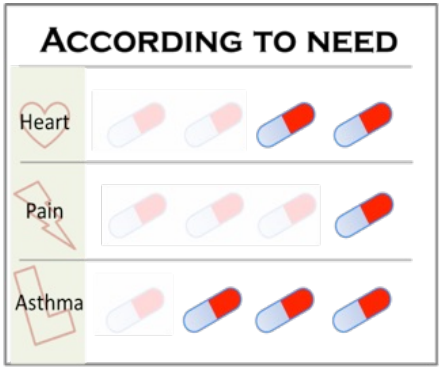
(Dalgaard, Grönvall & **Verdezoto**, PervasiveHealth 2013 + ICHI 2013)

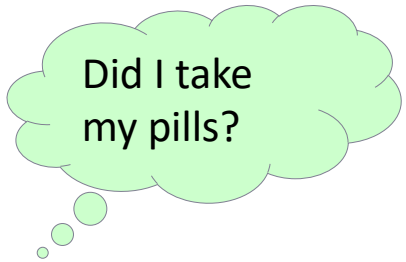
EXAMPLE: MEDICATION MANAGEMENT

Anita – 73 years old

(Grönvall & **Verdezoto**, PervasiveHealth 2013)

Complexity of the medication intake





Forgetfulness

Substitute medication

Delayed medication intake

Doctor's insights

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PRIFYSGOL CAERDYDD
VerdezotoDiasN@Cardiff.ac.uk

HOW THE RESULTS MIGHT LOOK LIKE?

"If I've eaten **late**, I'm skipping my evening medication because I don't want to stay up two hours more just to take my medication"

"The nurse told me that I don't have to take them all… but my doctor said you have to… and then who do you listen to… I have to listen to my doctor right?"

"I don't know the name because it's something new every time you buy - it is a different drug. It's called something different every time (…). So I took the wrong pills, I couldn't figure it out"

"I have my doctor's medication in the bathroom. Because to begin with I forgot those blood pressure *[medications]*…. that wasn't so good. I did that often".

"… it's always in the morning that I miss it *[forget to refill medication]* and then it takes 20 phone calls before I get through…".

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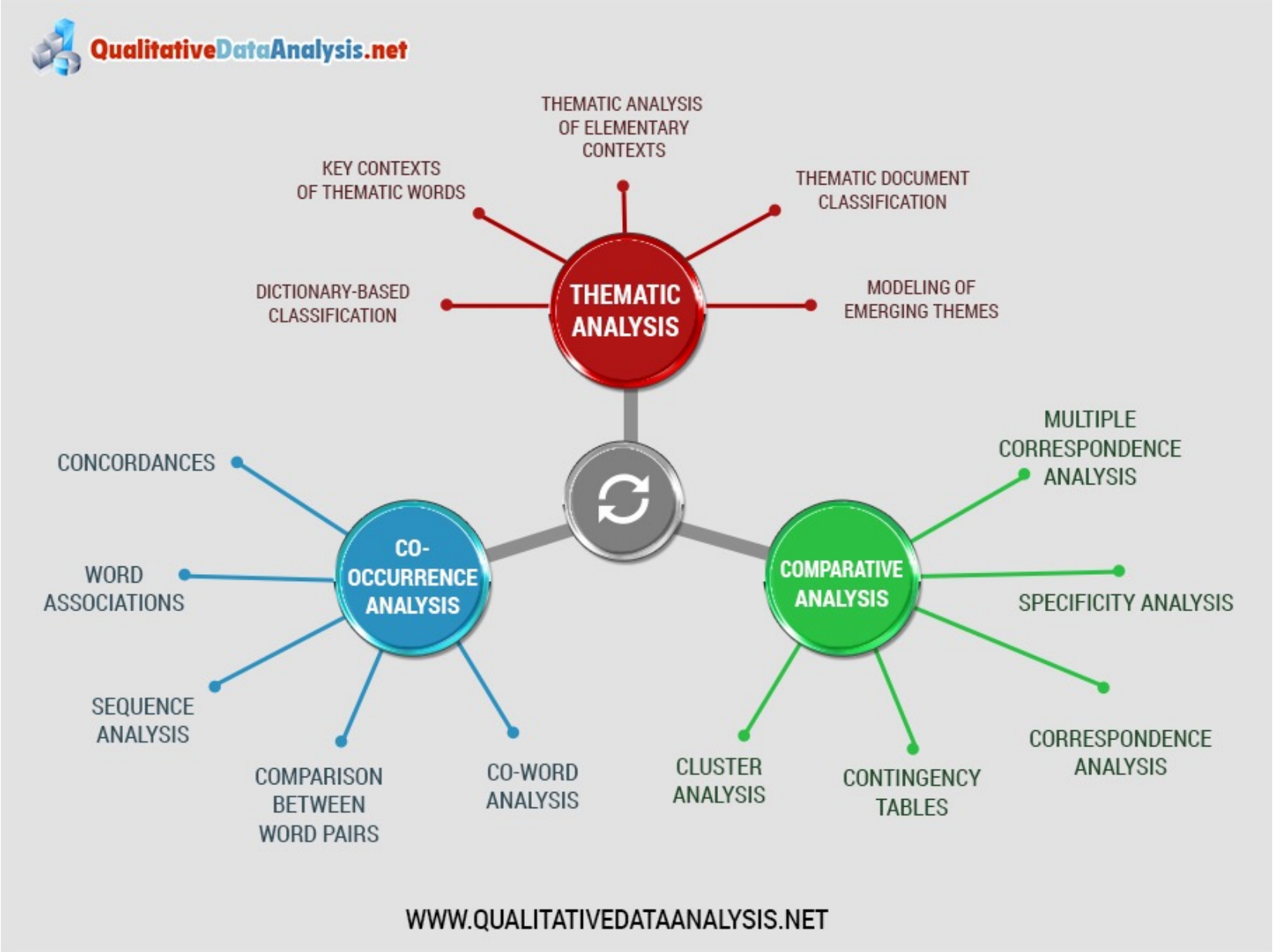
QUALITATIVE ANALYSIS



AFFINITY DIAGRAMMING

AFFINITY DIAGRAMMING

1. Write each of your **insights** on a separate post-it note
2. Spread the notes on the table/desk so they are visible to everyone
3. Gather the team around the cards/post-it notes
4. Together look **for ideas that are related** and place them side by side
5. It is okay to have loners that do not fit any group
6. If a card/post-it note seems to **belong in two groups**, make a second one with the same finding and put it in both groups
7. When **all** cards/post-it notes are grouped select a **title**, a **short description** for each group and a **representative finding**

HOW THE RESULTS LOOK LIKE?

Theme 1: Skipping medication intake

"If I've eaten **late**, I'm skipping my evening medication because I don't want to stay up two hours more just to take my medication"

Theme 2: Contradictions between carers

"The nurse told me that I don't have to take them all… but my doctor said you have to… and then who do you listen to… I have to listen to my doctor right?"

Theme 3: Substitute Medication

"I don't know the name because it's something new every time you buy - it is a different drug. It's called something different every time (…). So I took the wrong pills, I couldn't figure it out"

Theme 4: Forgetting ->medication

"I have my doctor's medication in the bathroom. Because to begin with I forgot those blood pressure *[medications]*…. that wasn't so good. I did that often".

Theme 4: Forgetting ->refill medication

"… it's always in the morning that I miss it *[forget to refill medication]* and then it takes 20 phone calls before I get through…".

Report Qualitative Results:

- **Themes** from the analysis
- **Interpretation**
- At least **one representative** example e.g., quotes.
- Do **NOT** use % -> Be specific: a participant **said**, 3 out of 5 participants **expressed…**

Qualitative Observations?

FROM THE PREVIOUS EXAMPLE

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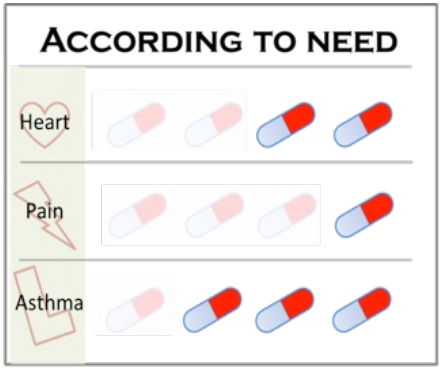

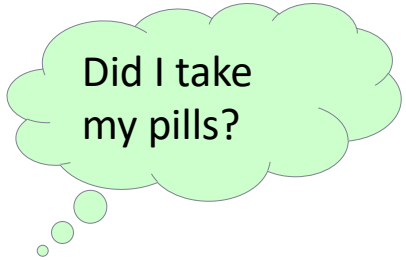

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PRIFYSGOL CAERDYDD
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QUALITATIVE OBSERVATIONS

- **Finding out what is happening**
  - Physical, social, cultural, and economic context
  - Relationships among and between people, context, ideas, norms, events, etc.
  - People's behaviors and activities

- **Seeking issues or new insights**

> The waiting room of the clinic was empty except for one girl who looked to be approximately 5 to 8 years old. She was sitting in the corner behind the chair. She peeked out from behind and looked at us when we entered the room talking. Her nose was running and her eyes were red and swollen

WHY OBSERVATIONAL STUDIES?

- Quantitative & lab studies **fall short** of understanding people in their "**messy**" everyday settings
- People cannot always **articulate** the intricacies of their behavior and interactions – "**invisible**"
- If we don't understand contextualized behaviors properly **our designs could fail**

WHY OBSERVATIONAL STUDIES?

Ballegaard, S. A., Bunde-Pedersen, J., & Bardram, J. E. (2006, October). **Where to, Roberta?: reflecting on the role of technology in assisted living**. In Proceedings of the 4th Nordic conference on Human-computer interaction: changing roles (pp. 373-376). ACM.

. A., Hansen, T. R., & Kyng, M. (2008). **Healthcare in everyday life: designing healthcare services for daily life**. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. ACM.

PARTICIPANT OBSERVATIONS

Advantages vs. Disadvantages

- Allows for insights into context, relationships, behavior
- Can provide information previously unknown that is crucial for the project, data collection, requirements, etc.

- Time-consuming
- Documentation relies on memory, personal discipline, and diligence of researcher
- Requires conscious effort at objectivity because methods is inherently subjective

TIPS FOR INTERVIEWS AND OBSERVATIONS

- **Critical Incident Technique**
- **Recalling a specific Time**
- **Life cycle of a particular activity/object**





Stisen, A., **Verdezoto**, N., Blunck, H., Kjærgaard, M.B. and Grønbæk, K. (2016). Accounting for the Invisible Work of Hospital Orderlies: Designing for Local and Global Coordination. In Proc. of the The 19th ACM conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2016).

Stisen, A., and **Verdezoto**, N. Clinical and Non-clinical Handovers: Designing for Critical Moments. Accepted at the 20th ACM conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2017)

Stisen, A., and **Verdezoto**, N. Non-clinical Task Puzzles: A Case Study of Hospital Orderlies Achieving Overviews. Unpublished manuscript to be submitted to ECSCW 2017

RESULTS: INTERVIEWS AND OBSERVATIONS

"If the nurse knows the patient, and has said ok for it *[patient transport], then there is a secretary that says that has been said ok…* It is ok, you can just leave with the patient, then *there is not problem"*

- **Observation:**

An orderly is just outside the room where the patient is hospitalized according to the TMA. As the orderly checks the room, the patient is not inside the room, therefore the orderly has to locate a nurse to ask where the patient is. The orderly keeps an eye out for the patient and heads to the department hub to asks the nurse. The first nurse we met on the way does not know where the patient is, so the orderly continues to the hub. The orderly asks a nurse at the hub, who says that it is the correct room that is shown in the TMA. The orderly and the nurse heads back to the room, and now the patient is in the room. While trying to locate the patient, the patient was in another room talking to another patient. (Orderly-1)

TIPS FOR INTERVIEWS AND OBSERVATIONS

- **Critical Incident Technique**
  - Particular incident (frustrating, surprising, annoying)
  - Description of the incident with details
  - Look for real examples of a breakdown

- **Recalling/Observing a specific Time**
  - Describe events of a specific time and day
  - How this typical day look like?
  - Look for interesting examples including breakdowns

- **Life cycle of a particular activity/object**
  - Find out the life history of something

Qualitative Analysis (e.g., Affinity Diagram or also Thematic Analysis)

- Themes from the analysis
- Write an **Interpretation**
- At least one representative example e.g., quotes or snippet

FROM THE PREVIOUS EXAMPLE

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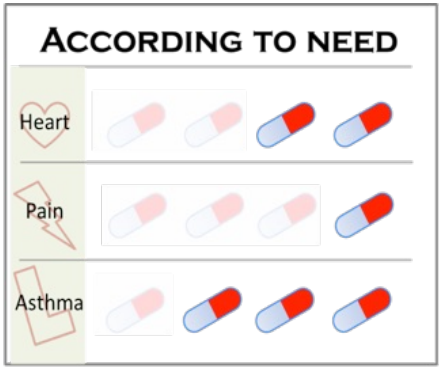

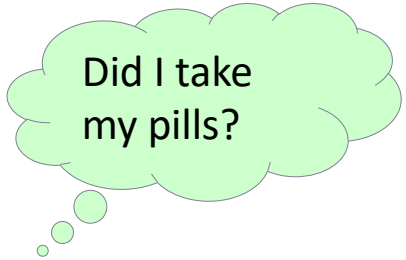

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EXAMPLE: COMBINED RESULTS

Results:

- **34 %** of the participants are *unintentionally non-compliant* and **23%** are *intentionally noncompliant*
- Non compliance does not increase with the *number of pills-quantity* but with the *number of times a day-frequency*- the person takes the medication
- The participants own and use a lot of technologies including *mobile phones* (78%), *computers and Internet* (58%)

Table 1: Combined results of the user studies

A. Complexity of Medication Regimens - 38% take more than 3 different medicines - 20% take medicine more than 3 times a day
B. Forgetting Medication Dose - 34% have forgotten to take their medication
C.Habits and Routines - 79% do something special to remember their medicine - 26% take their medicine in connection with meals - 22% have a visible medicine stored system - 36% have bought pill dispensing box.
D.Lack of knowledge about medicine - 75% have a high need for information - 58% are proactively seeking information regarding medication (41% Internet, 36% leaflet, 10% pharmacy)
E. Remembering - 12% have troubles remembering whether or not they have taken their medication - For some citizens it is hard to remember to order new medicine before they run out
F. Medicine outside the home (mostly the younger group) - 24% take medicine outside home several times a month - 30% have privacy concerns taking medicine in public
G. Support for caregivers - For people (e.g. nurses, spouses, etc.) who play a very active role in medication management

Verdezoto, N. X., & Wolff Olsen, J. (2012). Personalized medication management: towards a design of individualized support for elderly citizens at home. In Proceedings of the 2nd ACM SIGHIT International Health Informatics Symposium (pp. 813-818). ACM.