HCI and Design

SPRING 2016

Before we start…

- You have all submitted Assignment 2…. Right?
- Flexibility about assignment timing in general
- Check in on your project timelines
  - Are you where you're supposed to be?
- Resume Design module on Thursday (hopefully..)

Topics for today

- Qualitative research
- Analysis methods
- Validity and generalizability

Qualitative Methods

Interviews

Contextual inquiry

Observation

Participatory design sessions / Focus groups

Field deployments

Quantitative vs. Qualitative

1. Explanation through numbers
2. Objective
3. Deductive reasoning
4. Predefined variables and measurement
5. Data collection before analysis
6. Cause and effect relationships

1. Explanation through words
2. Subjective
3. Inductive reasoning
4. Creativity, extraneous variables
5. Data collection and analysis intertwined
6. Description, meaning

Getting ‘Good’ Qualitative Data

Depends on:

- The quality of the data collector
- The quality of the data analyzer
- The quality of the presenter / writer

Qualitative Data Sources

Open-ended survey responses

Written field notes

Audio recordings of conversations

Video recordings of activities

Diary recordings of activities / thoughts

Qualitative Data

Depth information on:

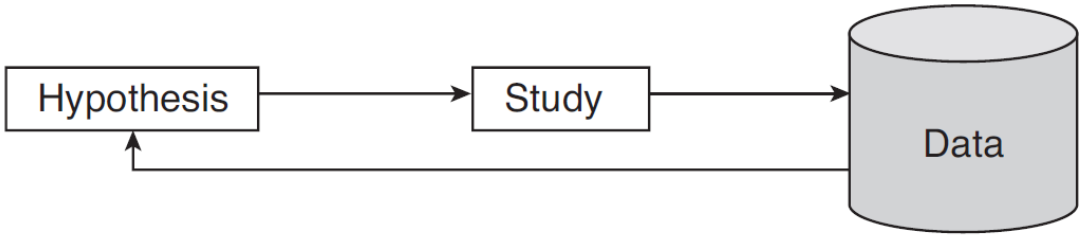
- thoughts, views, interpretations
- priorities, importance
- processes, practices
- intended effects of actions
- feelings and experiences

Topics for today

- Qualitative research
- Analysis methods
- Validity and generalizability

Grounded theory

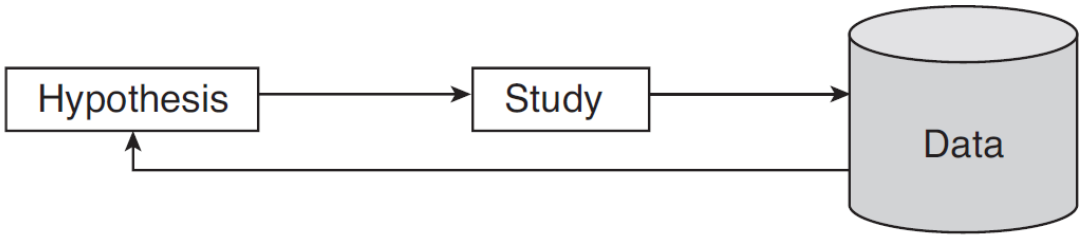
An inductive research method



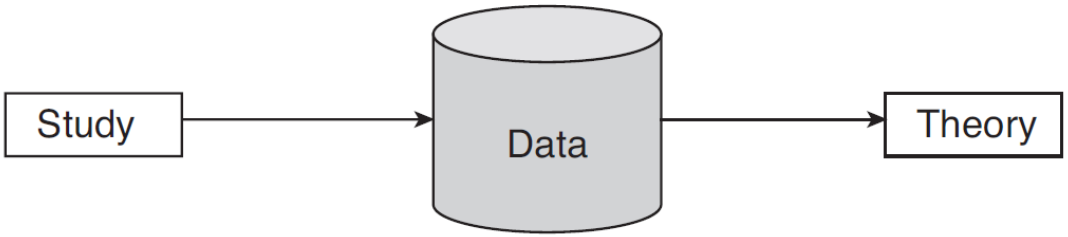
Experimental research

Grounded theory

An inductive research method



Experimental research



Grounded theory

Procedures of grounded theory

Open coding

Development of concepts

Grouping concepts into categories

Formation of a theory

Open Coding

Treat data as answers to open-ended questions

- ask data specific questions
- assign codes for answers
- record theoretical notes

Making comparisons

- Between different coding category
- Between different participant group
- Between existing data and previous literature

Example: Calendar Routines

Families were interviewed about their calendar routines

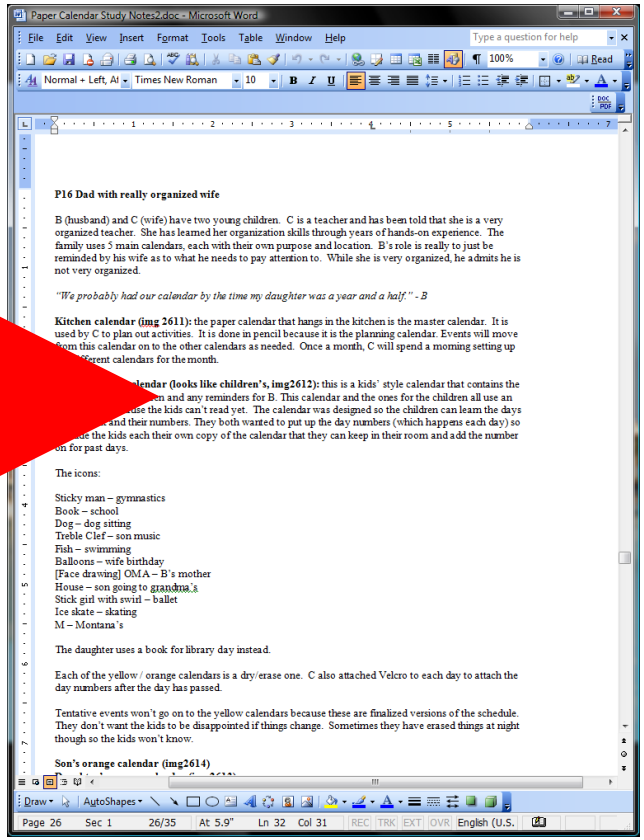
- What calendars they had
- Where they kept their calendars
- What types of events they recorded
- …

Written notes

Audio recordings

Example: Calendar Routines

Step 1: translate field notes (optional)



Example: Calendar Routines

Step 2: list questions / focal points

Where do families keep their calendars?
What uses do they have for their calendars?
Who adds to the calendars?
When do people check the calendars?
…

(you may end up adding to this list as you go through your data)

Example: Calendar Routines

Step 3: go through data and ask questions

B (husband) and C (wife) have two young children. C is a teacher and has been told that she is a very organized teacher. She has learned her organization skills through years of hands-on experience. The family uses 5 main calendars, each with their own purpose and location. B's role is really to just be reminded by his wife as to what he needs to pay attention to. While she is very organized, he admits he is not very organized.

"We probably had our calendar by the time my daughter was a year and a half." - B

Kitchen calendar (img 2611): the paper calendar that hangs in the kitchen is the master calendar. It is used by C to plan out activities. It is done in pencil because it is the planning calendar. Events will move from this calendar on to the other calendars as needed. Once a month, C will spend a morning setting up the different calendars for the month.

Orange family calendar (looks like children's, img2612): this is a kids' style calendar that contains the activities for the children and any reminders for B. This calendar and the ones for the children all use an icon system because the kids can't read yet. The calendar was designed so the children can learn the days of the week and their numbers. They both wanted to put up the day numbers (which happens each day) so C made the kids each their own copy of the calendar that they can keep in their room and add the number on for past days.

Where do families keep their calendars?

Example: Calendar Routines

Step 3: go through data and ask questions

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Calendar Locations:

[KI] – the kitchen

Where do families keep their calendars?

Example: Calendar Routines

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[CR]

Calendar Locations:

[KI] – the kitchen
[CR] – child's room

Where do families keep their calendars?

Example: Calendar Routines

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[KI]

[CR]

Calendar Locations:

[KI] – the kitchen
[CR] – child's room

Continue for the remaining questions….

Example: Calendar Routines

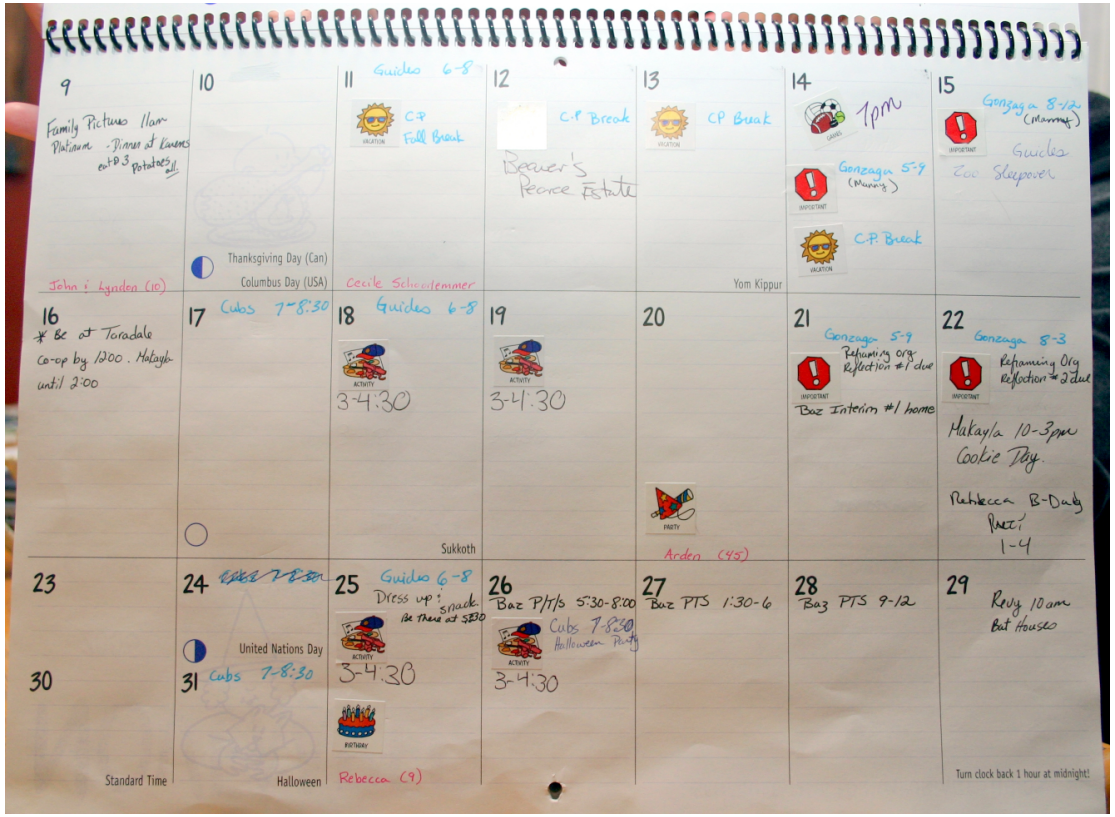
The result:

- list of codes
- frequency of each code
- a sense of the importance of each code

- frequency != importance

Example 2: Calendar Contents

Pictures were taken of family calendars



Example: Calendar Contents

Step 1: list questions / focal points

What type of events are on the calendar?
Who are the events for?
What other markings are made on the calendar?
…

(you may end up adding to this list as you go through your data)

Example: Calendar Contents

Step 2: go through data and ask questions

What types of events are on the calendar?

Example: Calendar Contents

Step 2: go through data and ask questions

Types of Events:

[FO] – family outing

What types of events are on the calendar?

Example: Calendar Contents

Step 2: go through data and ask questions

Types of Events:

[FO] – family outing
[AN] - anniversary

What types of events are on the calendar?

Example: Calendar Contents

Step 2: go through data and ask questions

Types of Events:

[FO] – family outing
[AN] - anniversary

Continue for the remaining questions….

Reporting Results

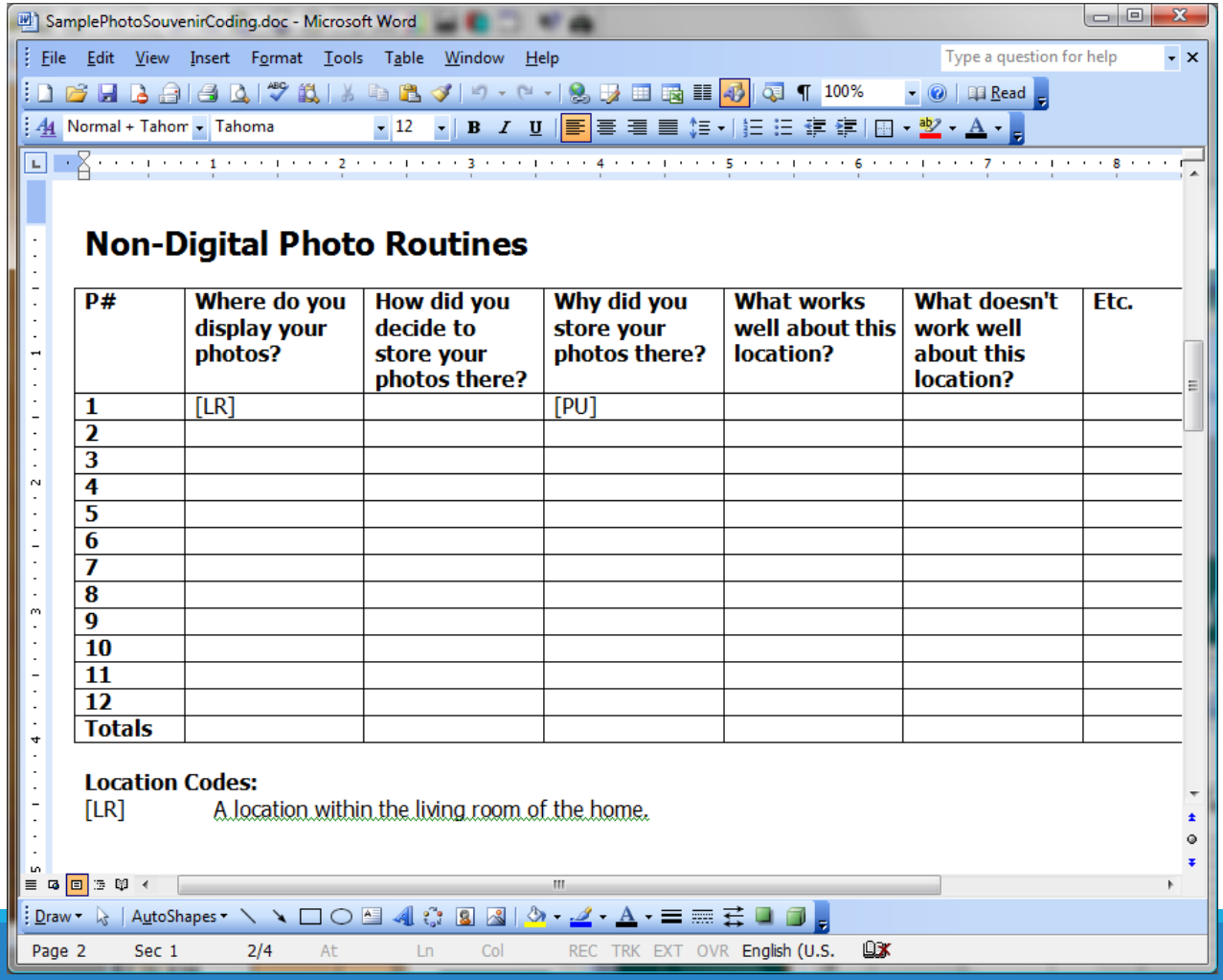
Find the main themes

Use quotes / scenarios to represent them

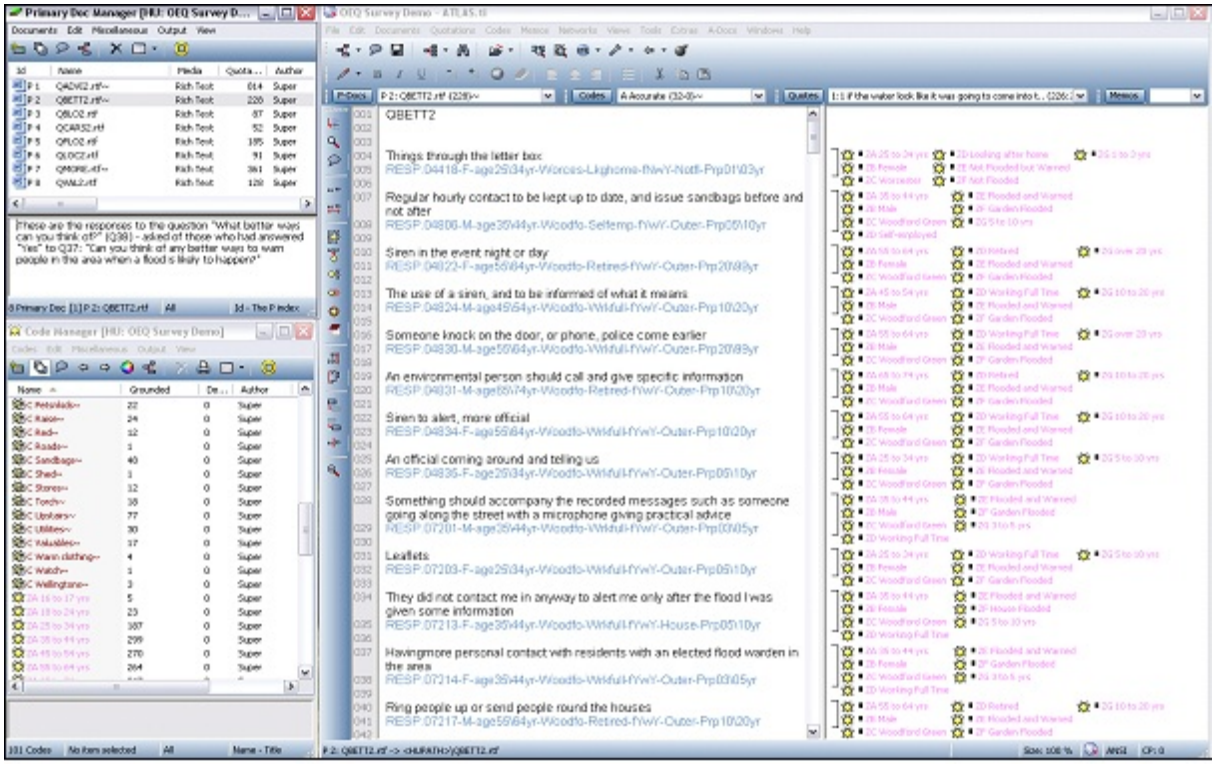
Include counts for codes (optional)

Dad's role. *"I'm pretty used to our schedule so I don't need to check it that often. As sad as it is, I work full time so a lot of activities don't pertain to me. But Fridays change because I may be home. I may also glance at it because the activities end at regular periods. I look for the ends of things because I'll try to make it to the last class so I can make it to at least one of their classes during that activity. And I'll glance at it to see if anything is out of the ordinary. I get used to the pattern so if there is something that is out of the ordinary I'll take a closer look to see what's going on…I don't have to do much. If I have something that is coming up, I'll just tell [my wife] then she'll know where I am and I'll know." - B*

Software: Microsoft Word/Excel



Software: ATLAS.ti



http://atlasti.com/free-trial-version/ -- free trial available

Affinity Diagramming

Goal: what are the main themes?

- Write ideas on sticky notes
- Place notes on a large wall / surface
- Group notes hierarchically to see main themes

Example: Calendar Field Study

Families were given a digital calendar to use in their homes

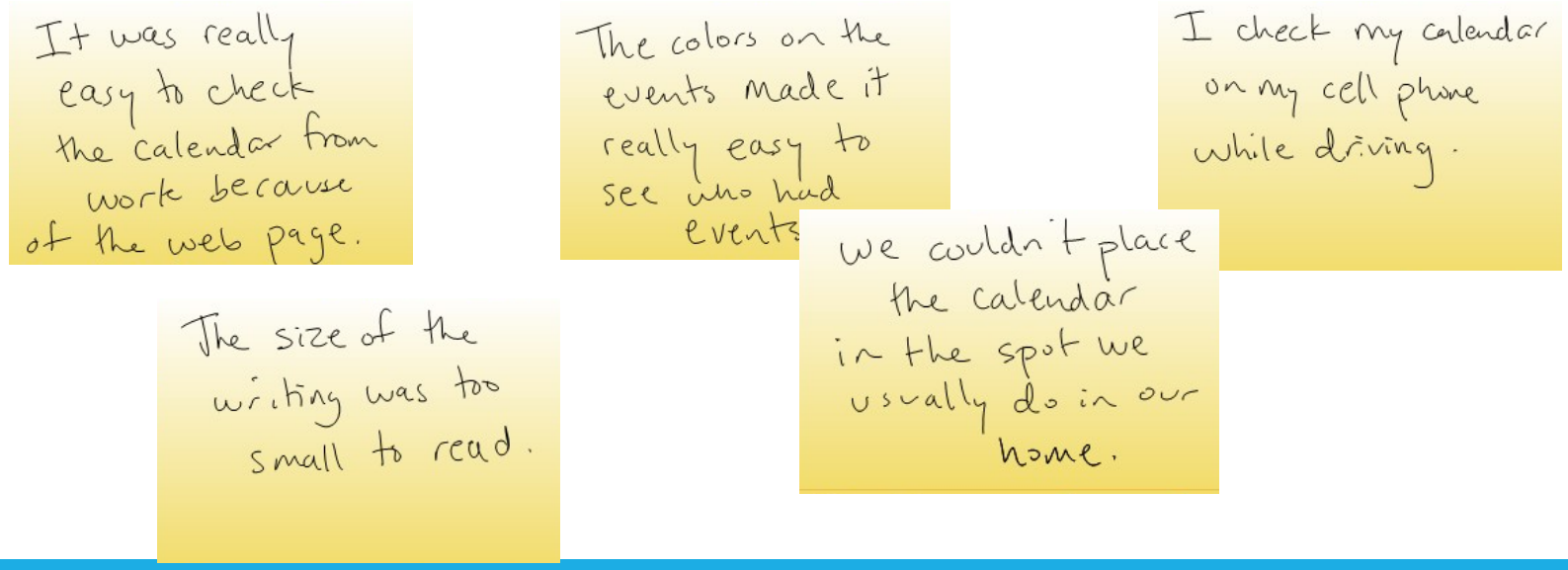
Thoughts / reactions recorded:

- Weekly interview notes
- Audio recordings from interviews

Example: Calendar Field Study

Step 1: Affinity Notes

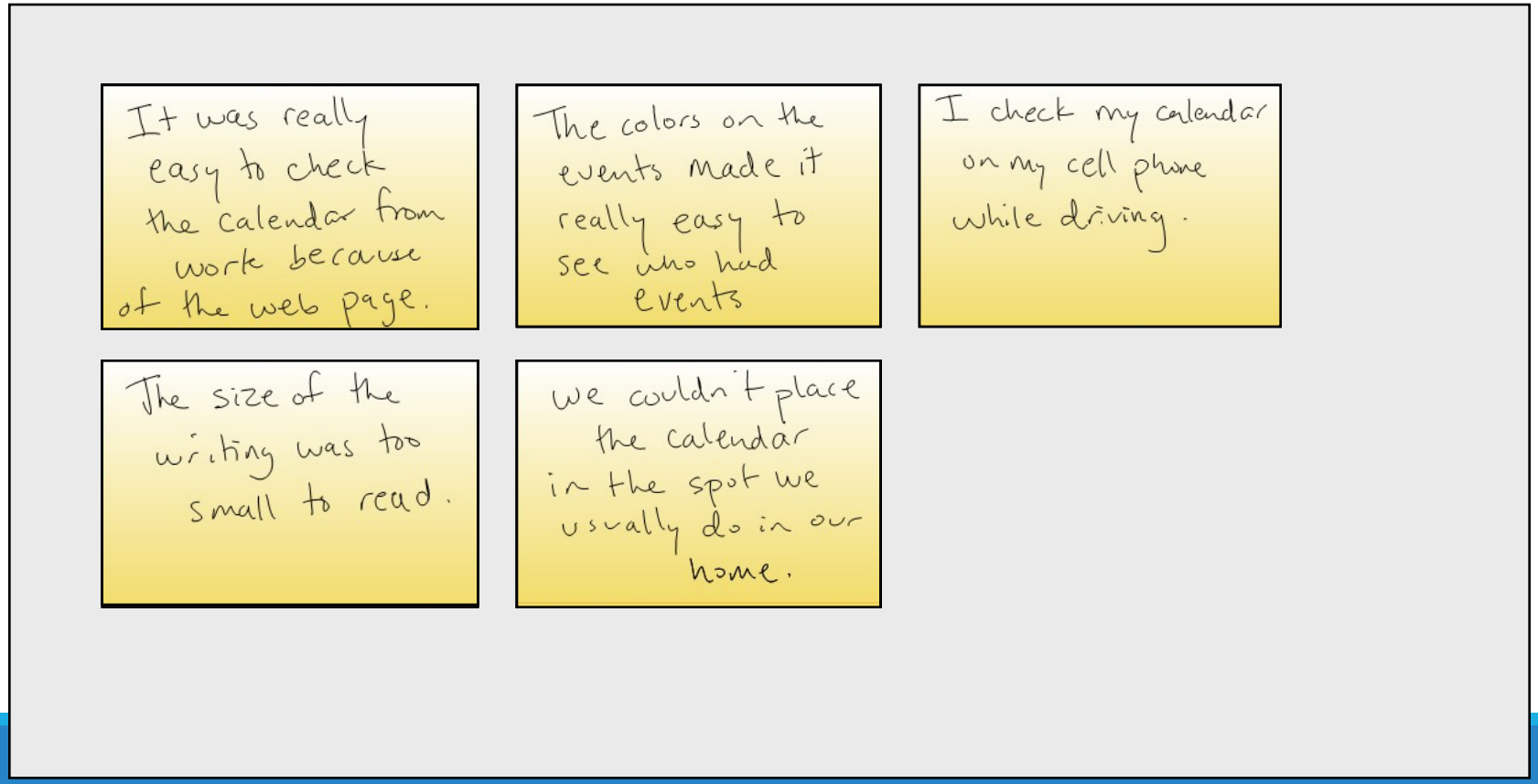
- go through data and write observations down on post-it notes
- each note contains one idea



Example: Calendar Field Study

Step 2: Diagram Building

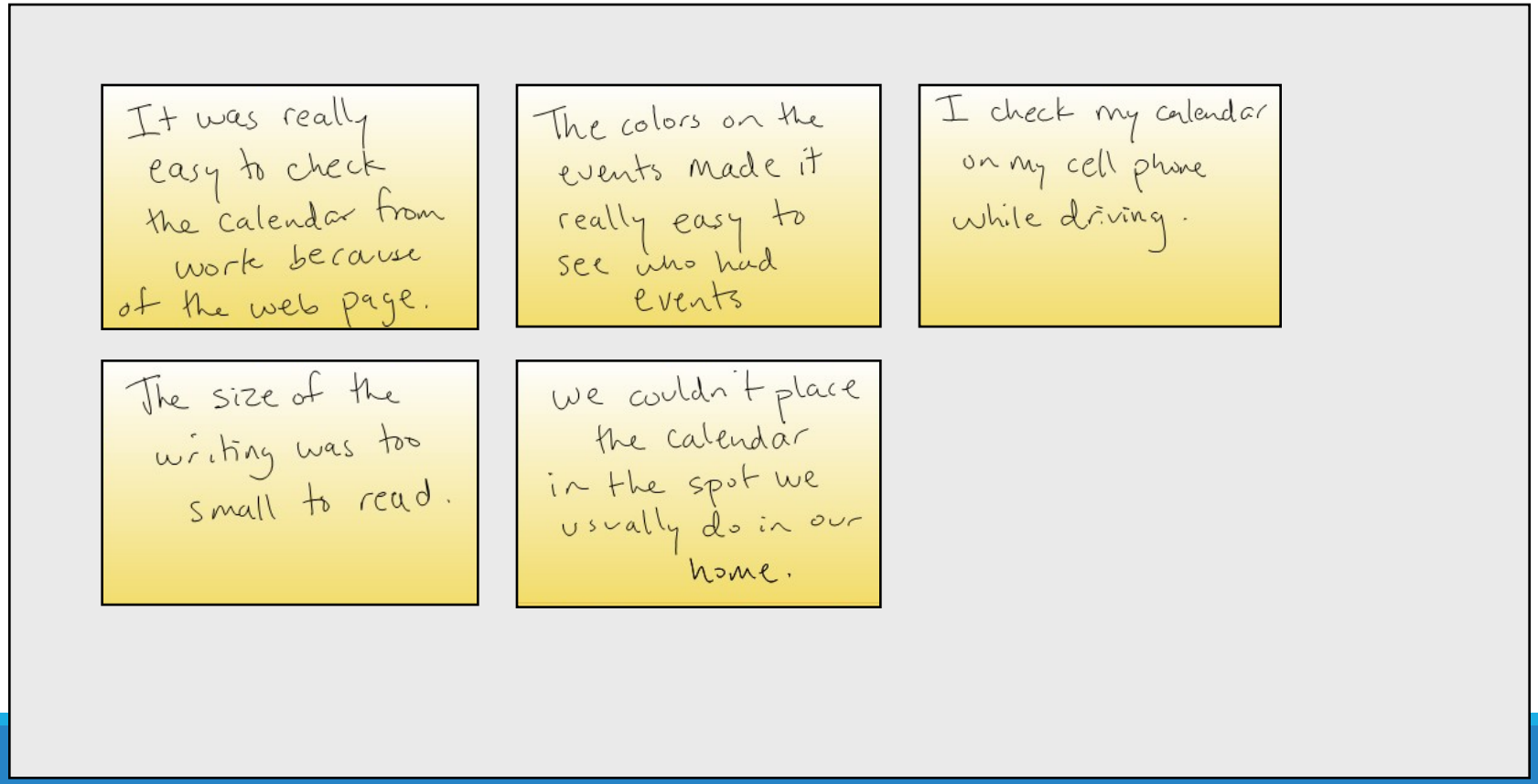
- place all notes on a wall / surface



Example: Calendar Field Study

Step 3: Diagram Building

- move notes into related columns / piles



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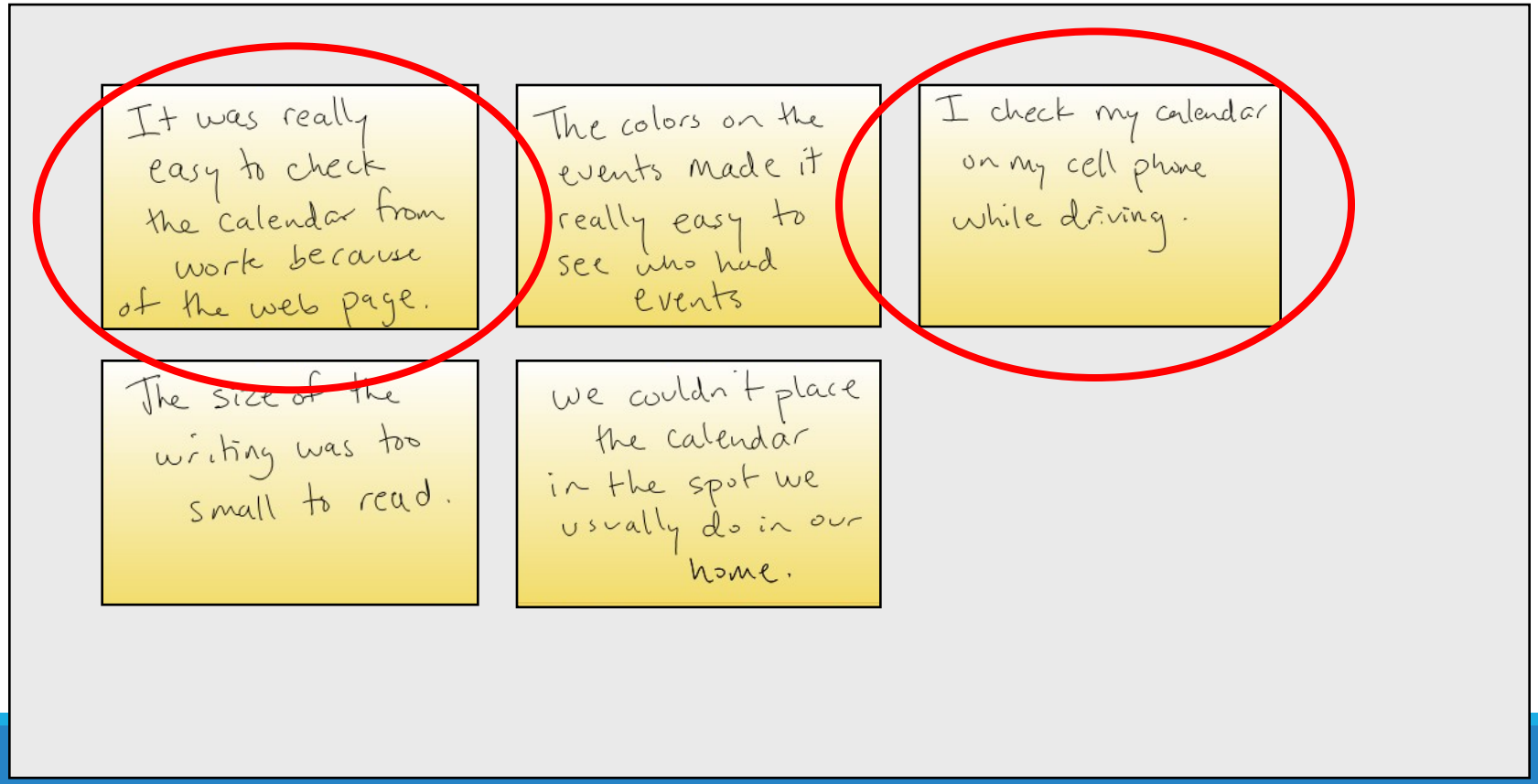

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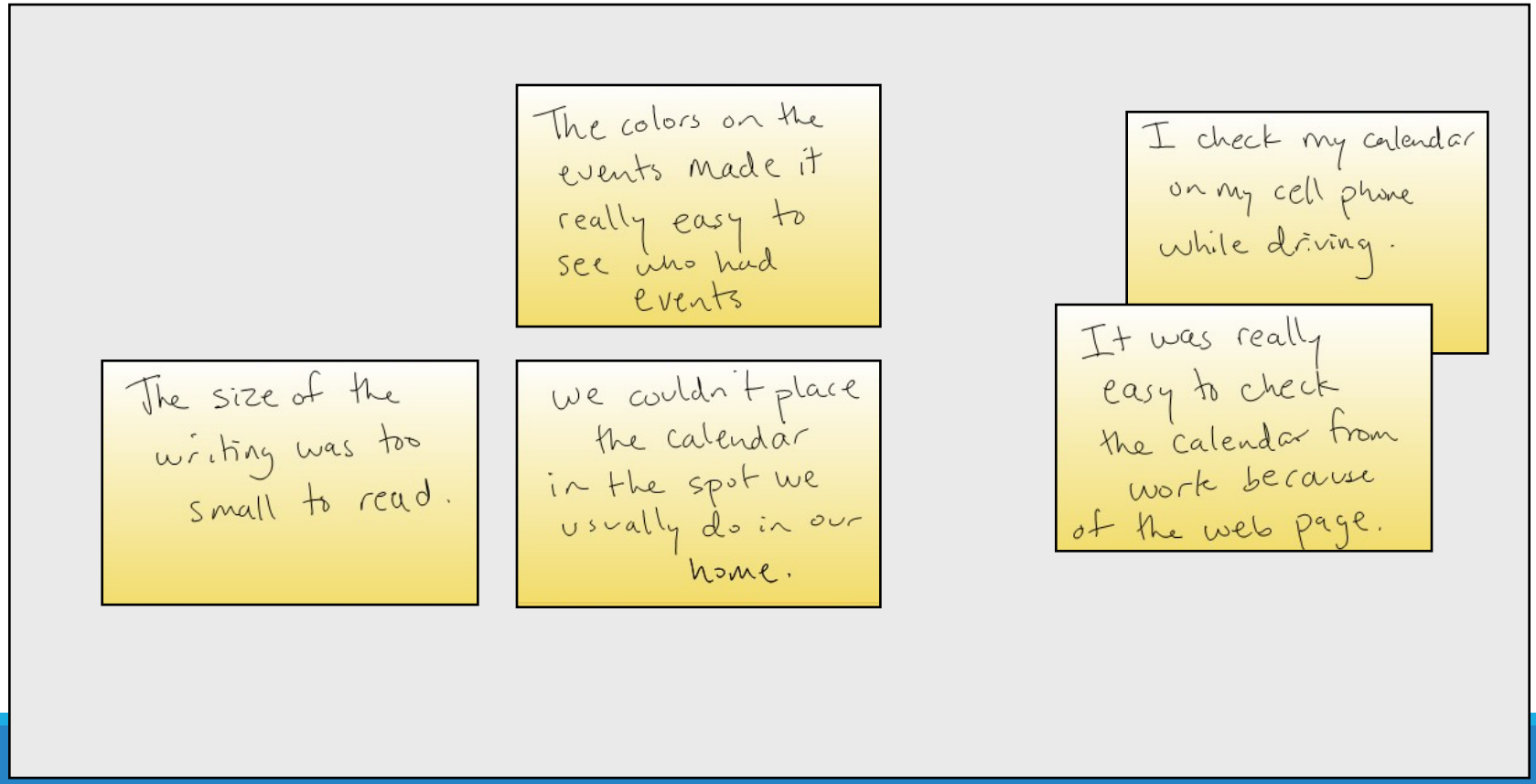

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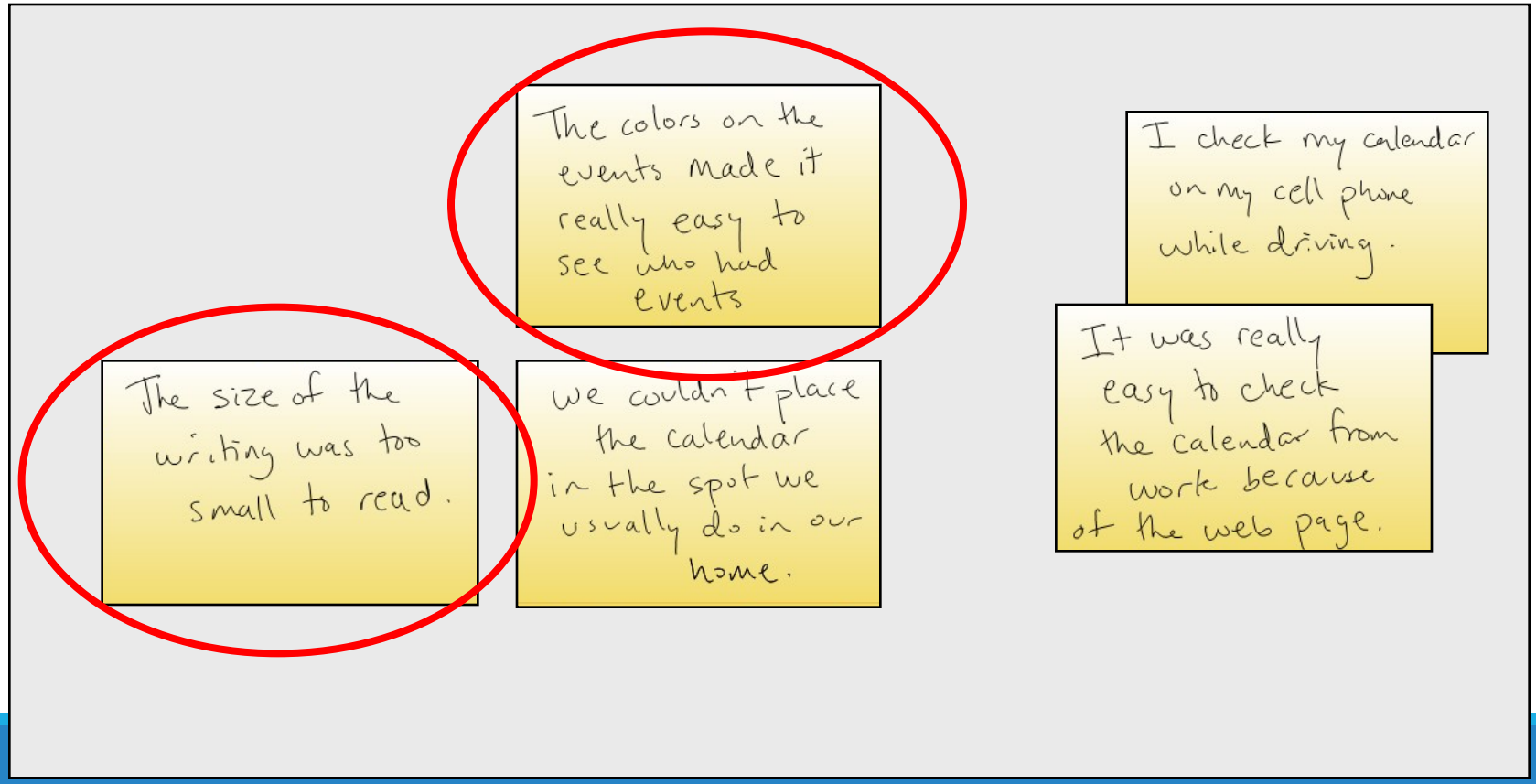

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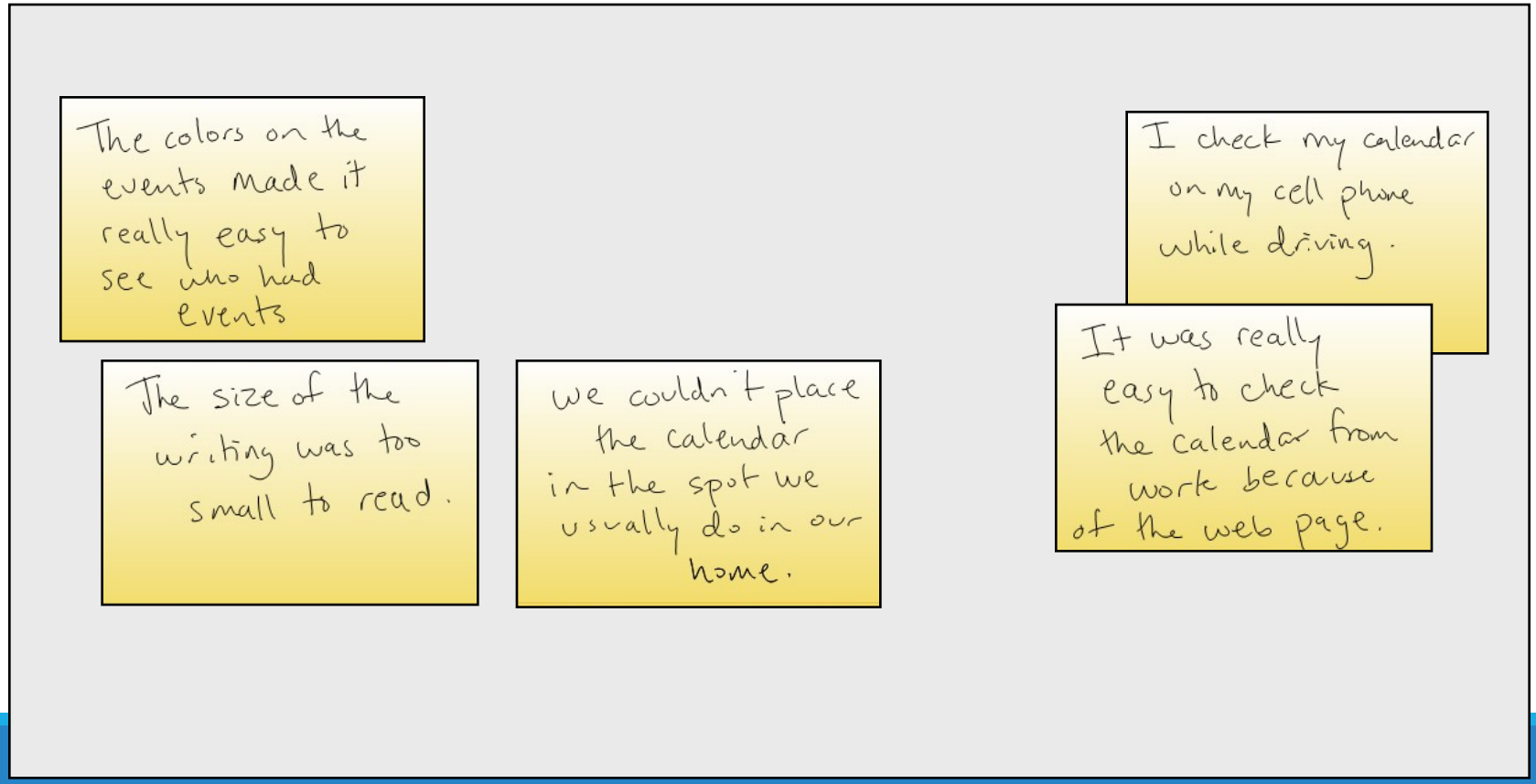

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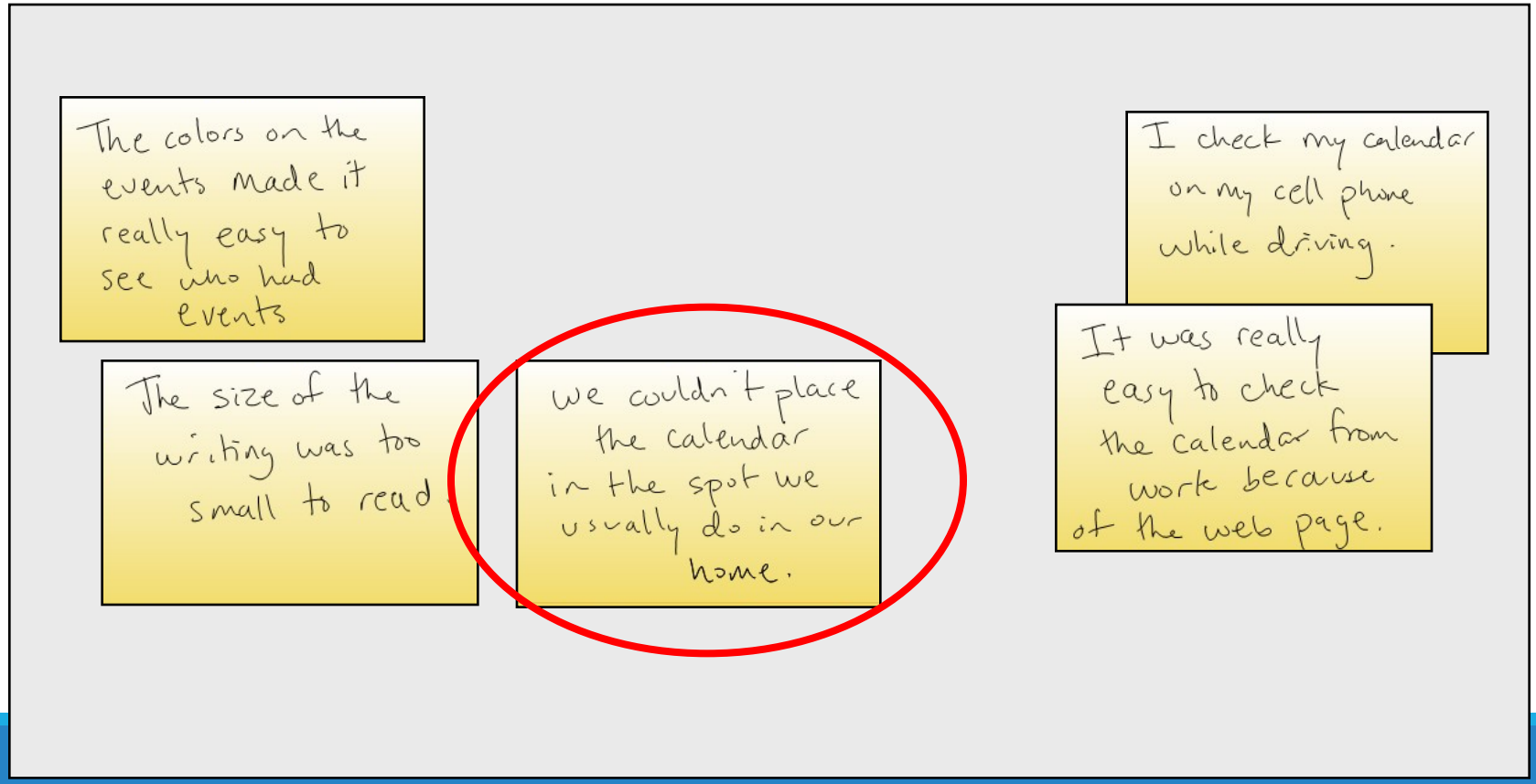

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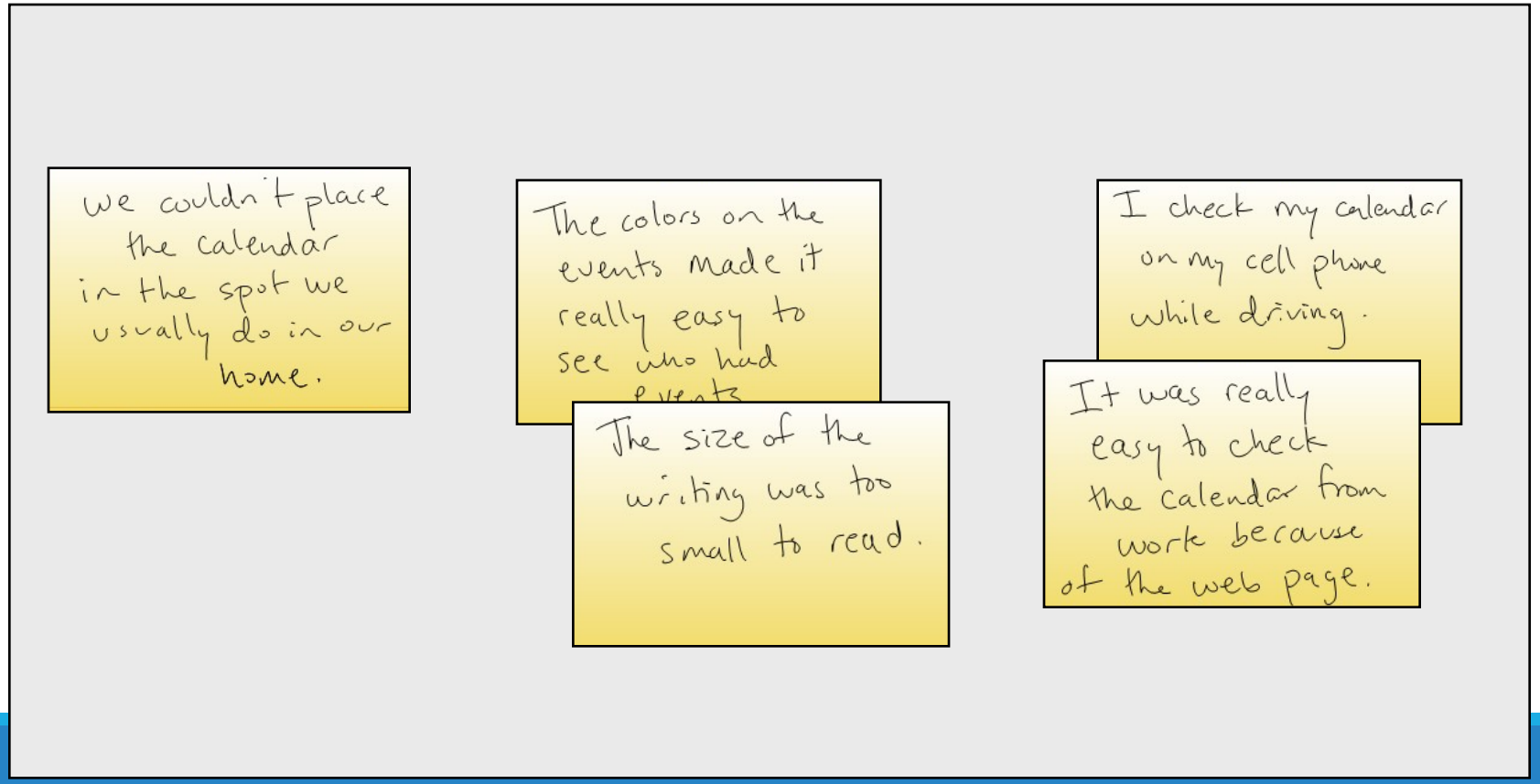
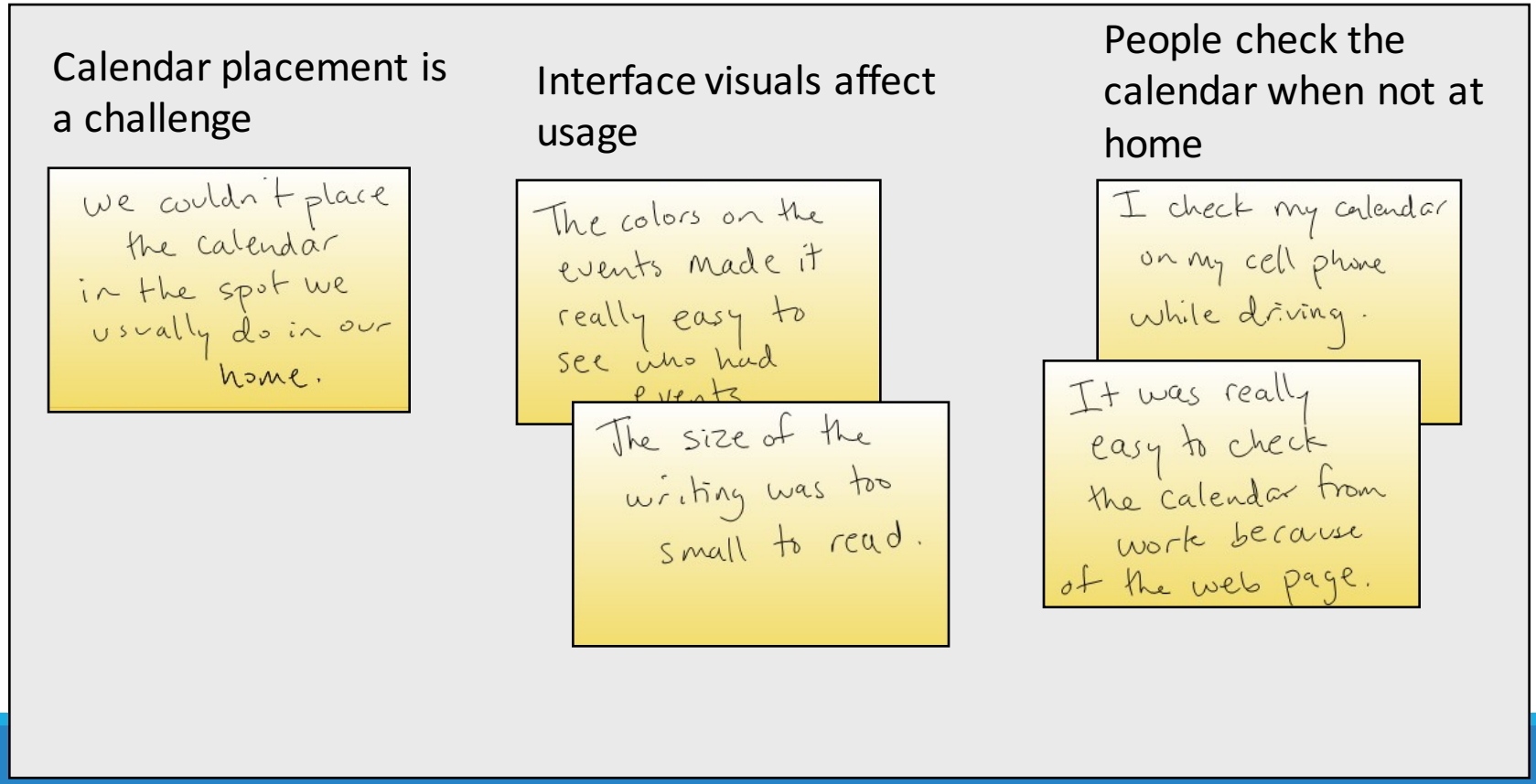


Example: Calendar Field Study

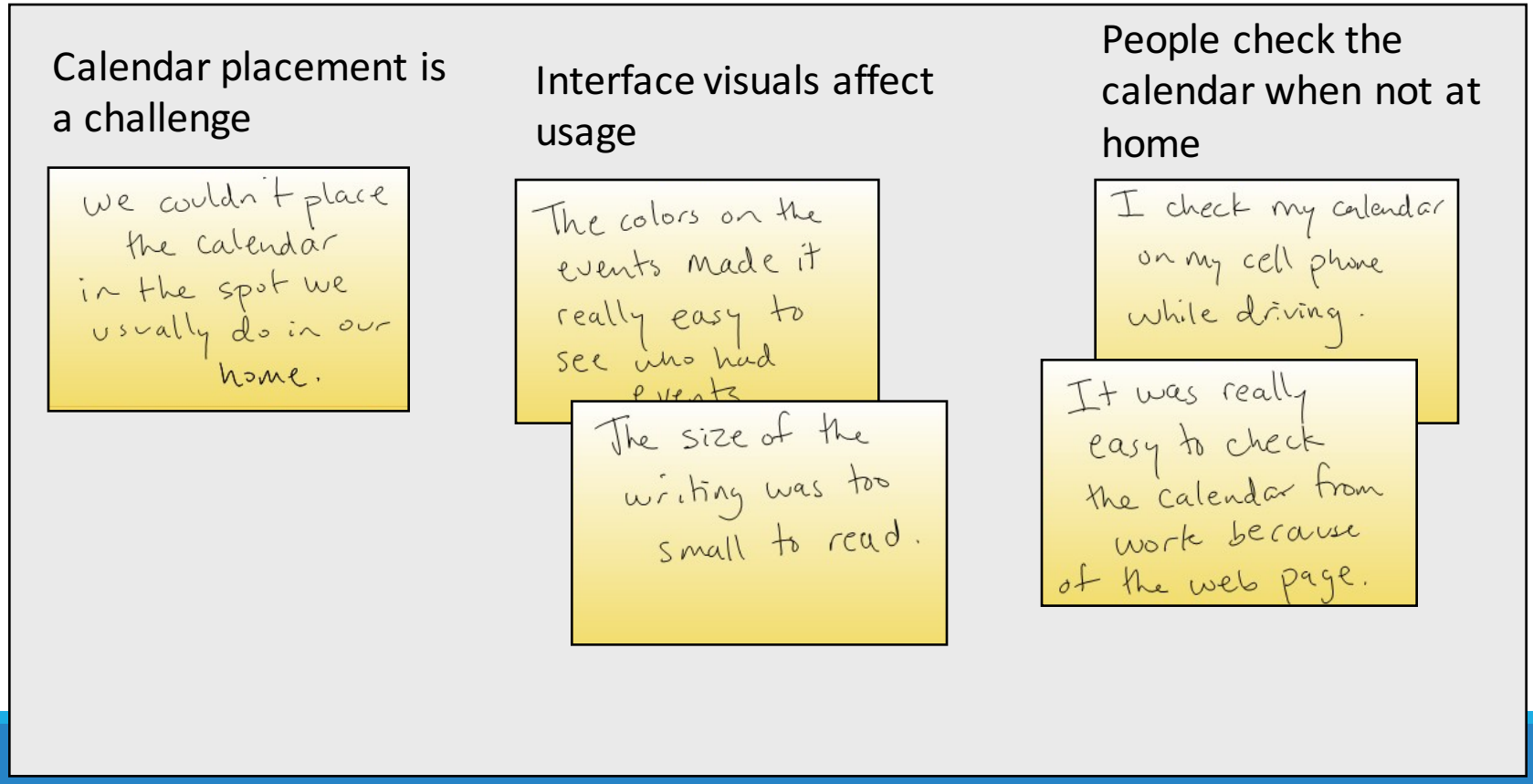
Step 4: Affinity Labels

- write labels describing each group



Example: Calendar Field Study

Step 5: Further Refine Groupings



Grounded theory

Advantages

- a systematic approach to analyzing qualitative, mostly text-based, data
- generating theory out of qualitative data that can be backed up by ample evidence of the coding
- Interplay between data collection and analysis

Disadvantages

- Researcher can be overwhelmed by the details of the data
- The theory generated is hard to evaluate
- Findings may be subject to bias

Topics for today

- Qualitative research
- Analysis methods
- Validity and generalizability

Validity Threats

Bias

- researcher’s influence on the study
- e.g., studying one’s own culture

Reactivity

- researcher's effect on the setting or people
- e.g., people may do things differently

Ensure high quality analysis

Validity

- Constructing a multi-faceted argument in favor of your interpretation of the data
- Data source triangulation
- Interpretation should account for as much of the data as possible
- Alternative interpretations may also help

Ensure high quality analysis

Reliability check

- Stability
  - also called *intra-coder reliability*
  - examines whether the same coder rates the data in the same way throughout the coding process
- Reproducibility
  - also called *inter-coder reliability or investigator triangulation*
  - examines whether different coders code the same data in a consistent way

Generalizability

Internal generalizability
- do findings extend *within* the group studied?

External generalizability
- do findings extend *outside* the group studied?

Summary

Good qualitative research: data collector / analyzer / presenter

Qualitative data: detailed descriptions (audio, written, video)

Analysis methods

- Grounded theory, open coding, affinity diagramming

Use validity tests

Look for generalizability

Next time…

- Interaction Design (Heather, Matt, Adam)