OurData

Understanding Family Privacy in Sensor-Rich Homes



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UbiComp ISWC 2026

Whose data is this?



Whose data is this?



ACCOUNT OWNER

Controls the camera and its recordings

FAMILY MEMBERS

Appears in a record of the household

VISITOR

Enters the scene without operating it

Each has a stake, but their ability to influence what happens can differ

Why sensor-rich homes make the boundary problem salient



Ambient sensing

Living in a Glass House
Choe et al., UbiComp'11



Long-term interdependence

Living with Interpersonal Data
Goulden et al., New Media & Society'18



Unequal authorities

Who's in Control?
Geeng & Roesner, CHI'19

Privacy meanings develop within everyday relationships and implicit expectations

Privacy extends beyond the individual



Others' data can reveal information about me

Privacy Dependencies, Barocas & Levy, Wash. L. Rev.'20
Networked Privacy, boyd, Surveillance & Society'12

Groups have privacy interests of their own

From Group Privacy to Collective Privacy
Mantelero, Group Privacy'17

Privacy protection must consider other affected people.

Home sensing connects personal and shared life



Co-produced through shared life

Human Data Interaction
Crabtree & Mortier, ECSCW'15

Visible and accountable to others

Living with Interpersonal Data
Goulden et al., New Media & Society'18

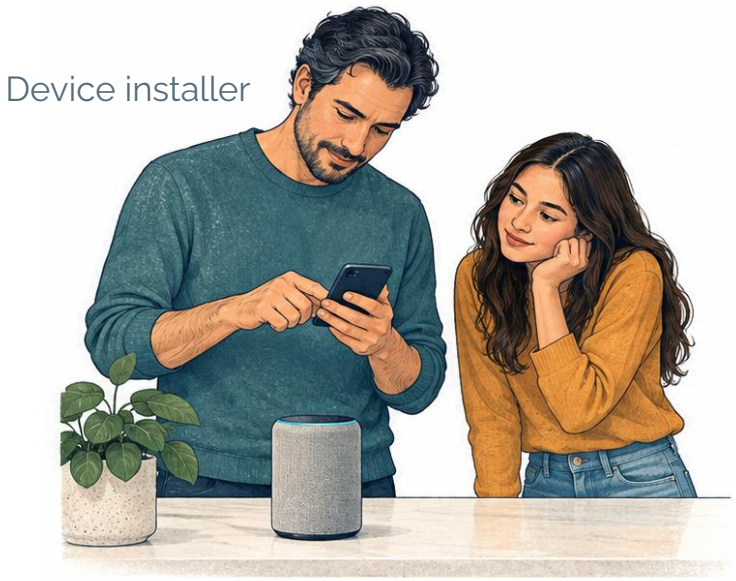
Useful to one, intrusive to another

Investigating Receptiveness to Sensing…
Choe et al., UbiComp'12

How do families decide what is personal, shared, or both?

Control and negotiation in smart homes

Unequal control



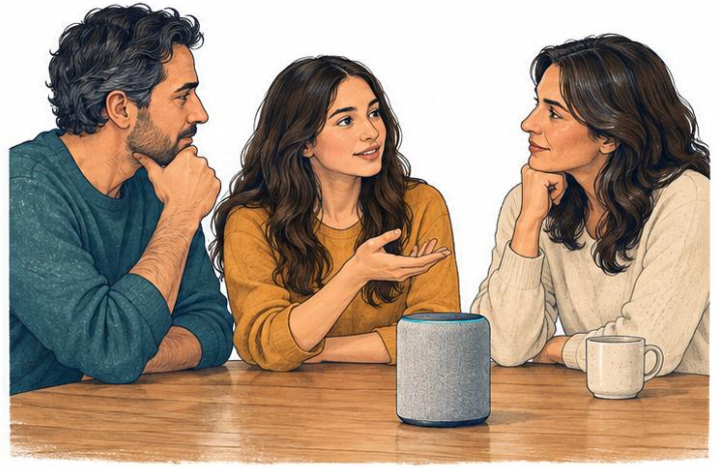
Who's in Control?
Geeng & Roesner, CHI'19

Shared access and awareness



Understanding and Improving Security and Privacy in Multi-User Smart Homes…
Zeng & Roesner, USENIX Security'19

Negotiated sensing preferences



Bring Privacy to the Table
Zhou et al., CHI'24

Prior designs make more household members part of privacy decisions.

The gap in family sensing

What Existing Work Established

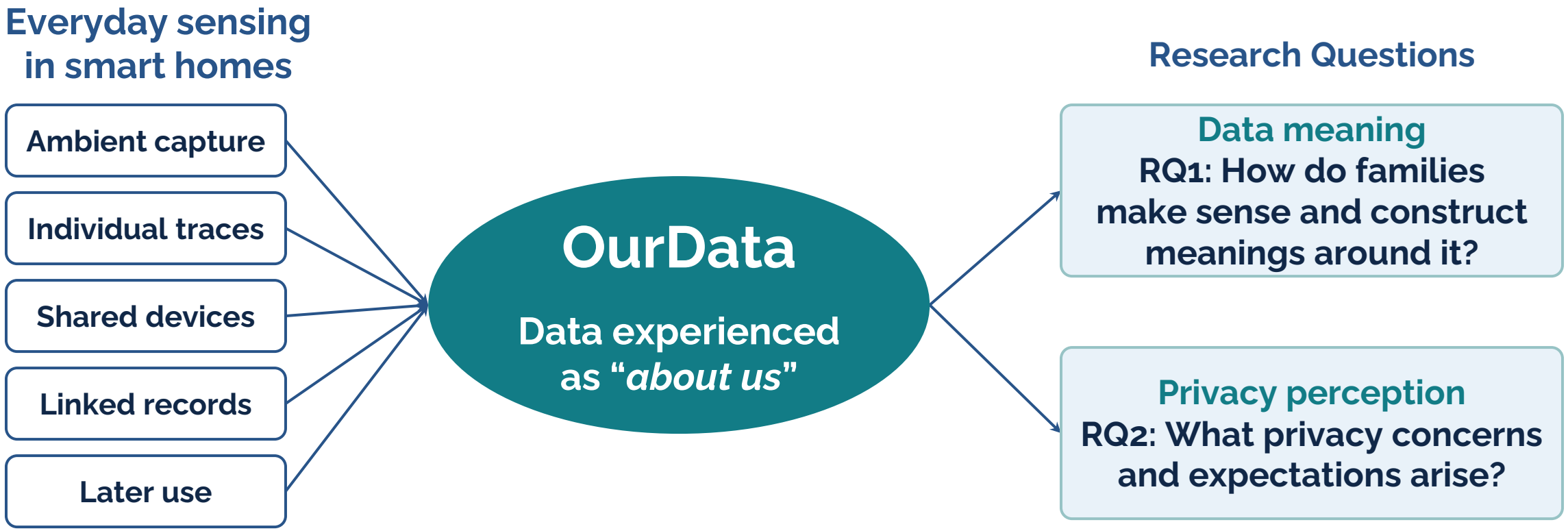
1. Privacy is interdependent
2. Sensing data can be relational
3. Control requires multiple stakeholders

What Remains Less Understood

How families come to see sensing data as "**about us**"

How this shapes privacy concerns and expectations

A Relational Perspective of Sensing Data



Vignette-based family interviews

10
families in Korea

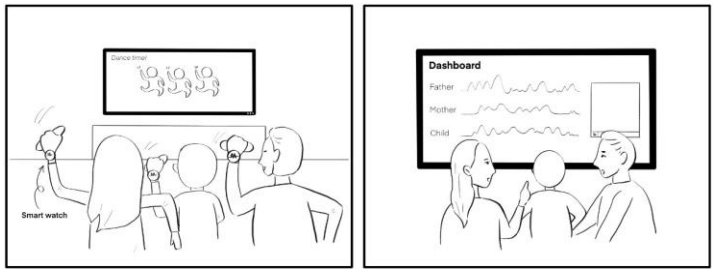
34
family members

≈70
minutes per interview

School-aged children and parents with smart-device experience

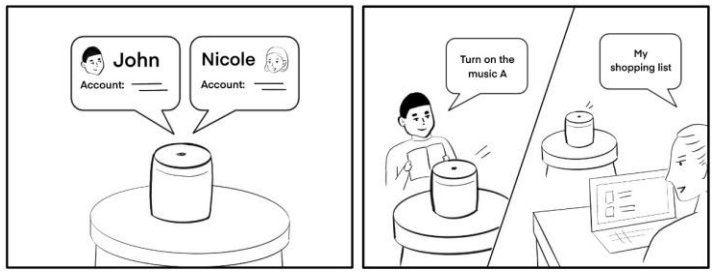
Three everyday sensing scenarios

Family health



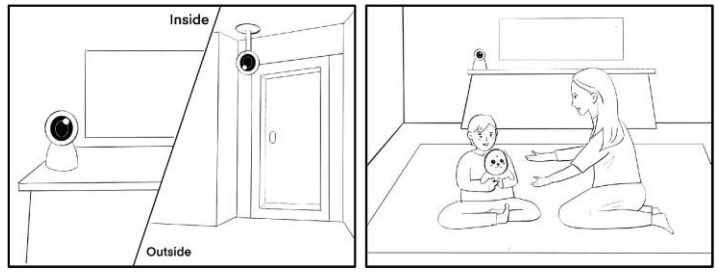
Wearables, mood,
and shared care

Device sharing



A shared speaker
on one person's account

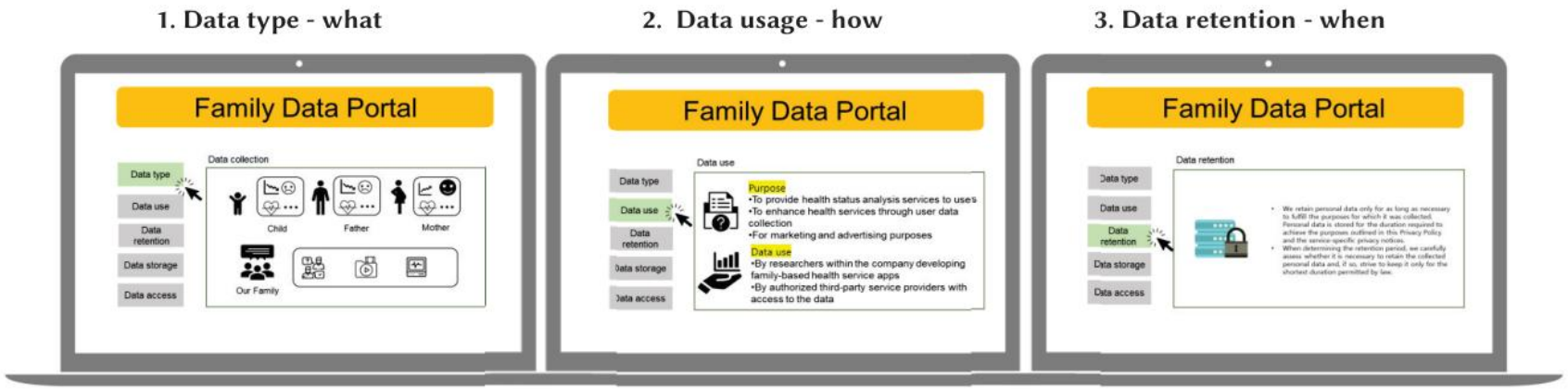
Home monitoring

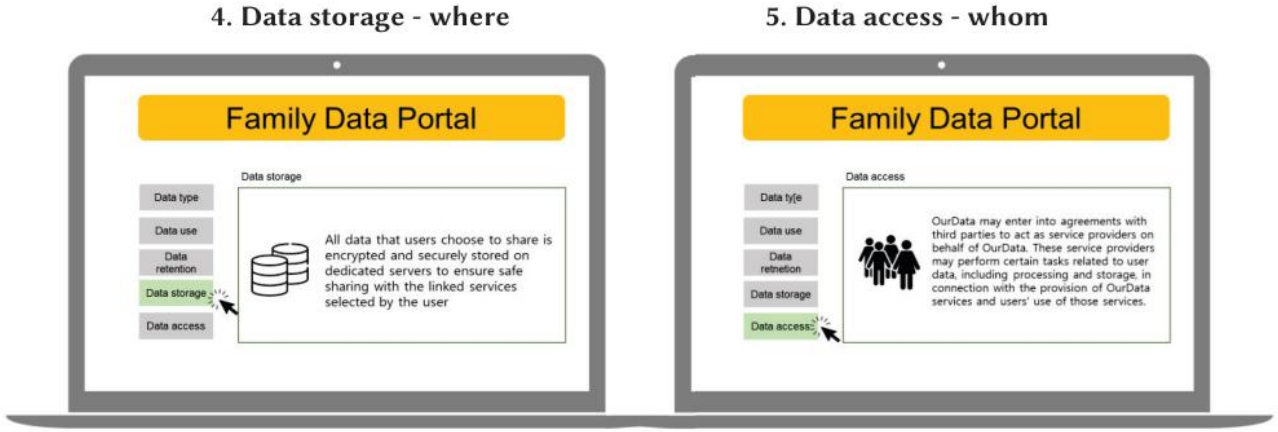


Cameras and a toy
with a microphone

Making privacy tensions discussable

Lo-Fi Storyboard Prototype



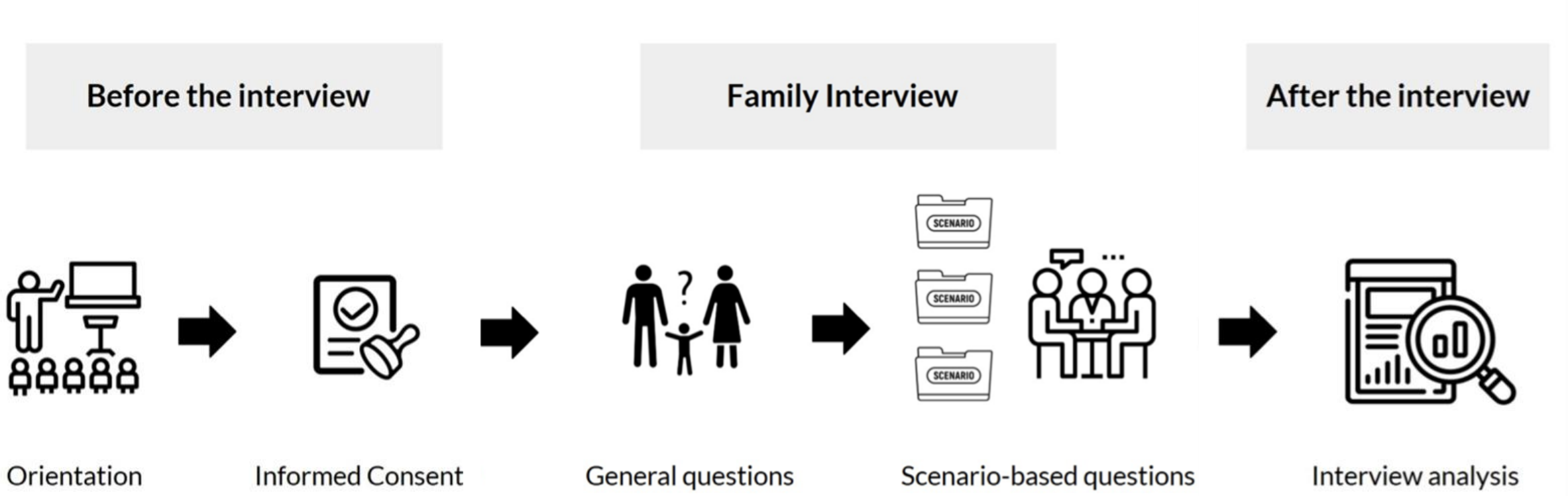


What are the types of personal or group data?

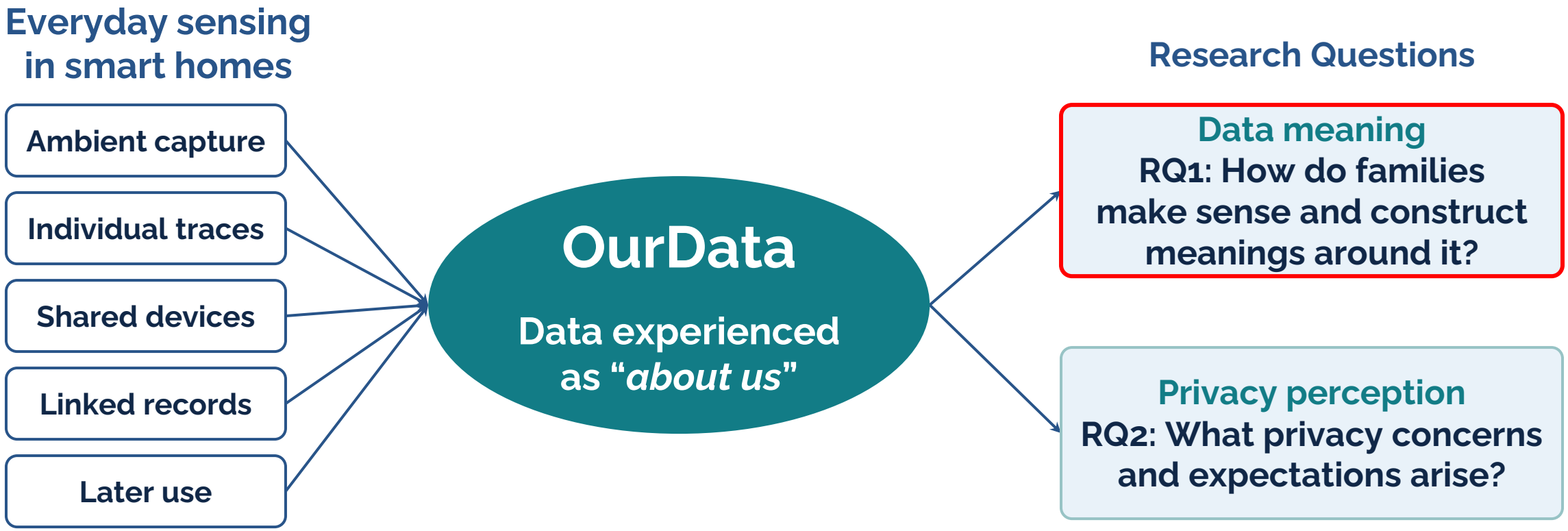
Who has access to the data?

What should remain private and what can be shared?

Study design and conceptualization process for OurData

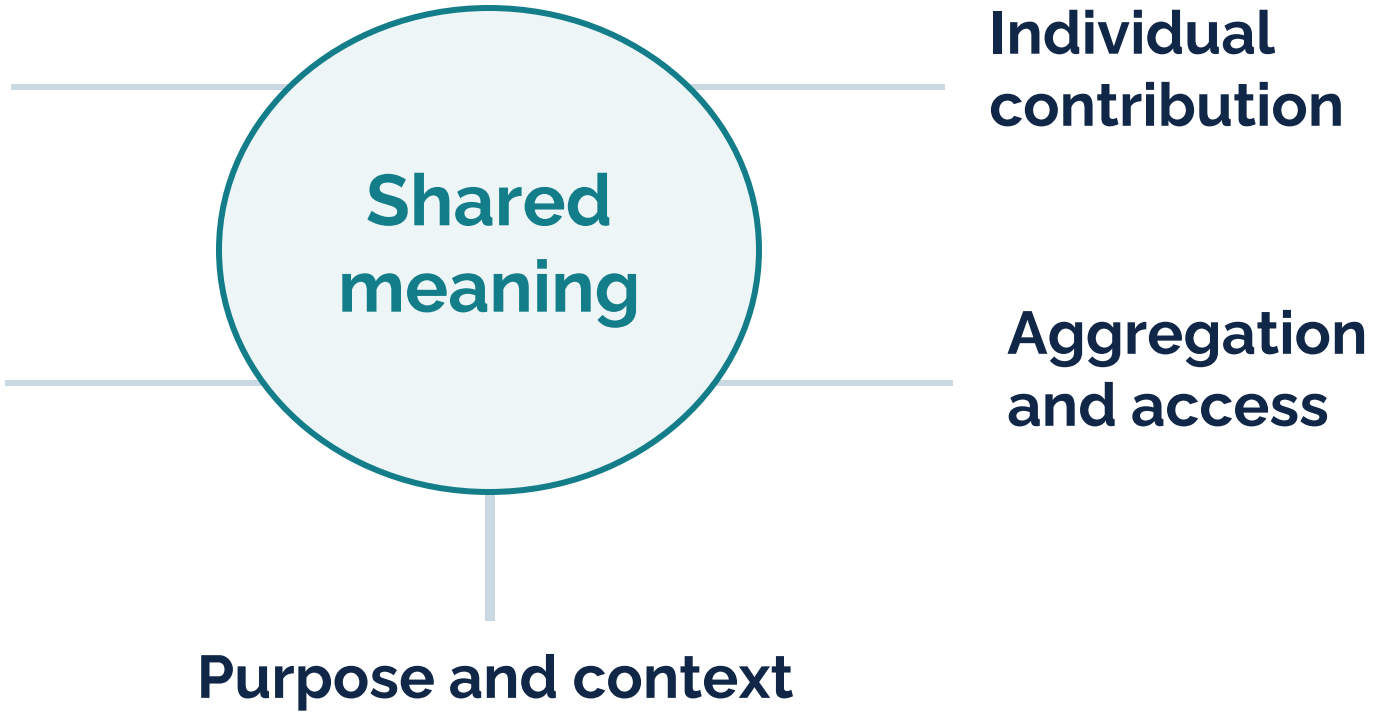


OurData: A Relational View of Sensing Data



How sensing data becomes “ours”

Families used five overlapping reasoning patterns

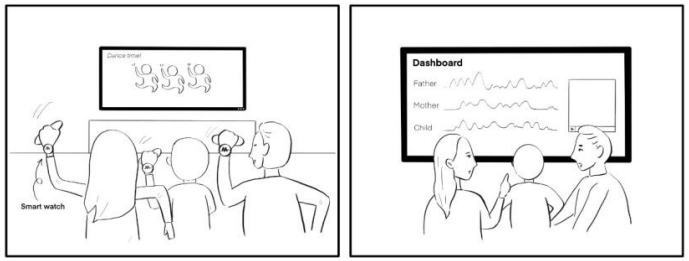


01 Shared activities in time and space

Joint Activity

"*Dad and I* ***play Pikmin together as we walk and share our location data****. I assume this is a type of family data?*"
(Family 1 - Daughter)

"Only the data from ***what we do together*** *matters."*
(Family 4 - Son)

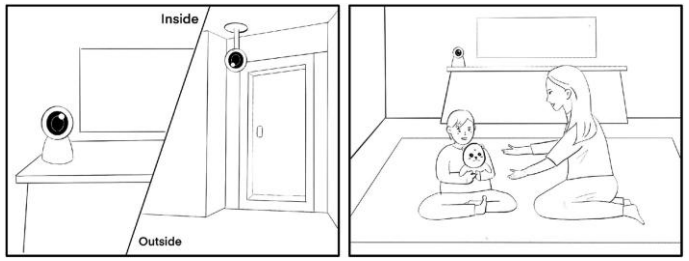


Walking and sharing health records

Incidental Co-Presence

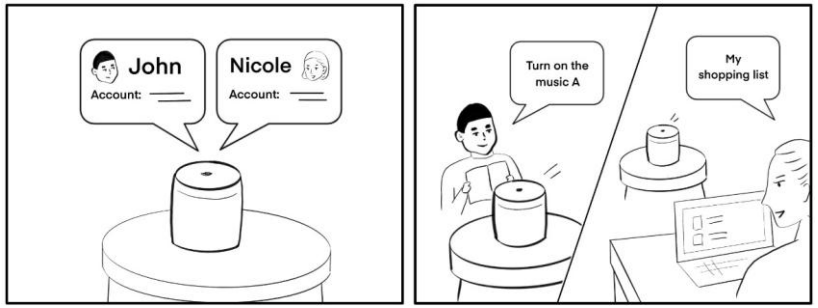
"If we're just ***all caught on camera doing our own things****,* ***that doesn't feel like family data.*** *"*

(Family 3 - Son)



Doing separate things on camera

02 Social intimacy level



1. Families using a speaker
2. Guests using the same speaker

Social Membership

"*I think group data is only applicable to* ***socially intimate groups****. It's like a* ***membership****. You're aware you're in it."* (Family 4 - Father)

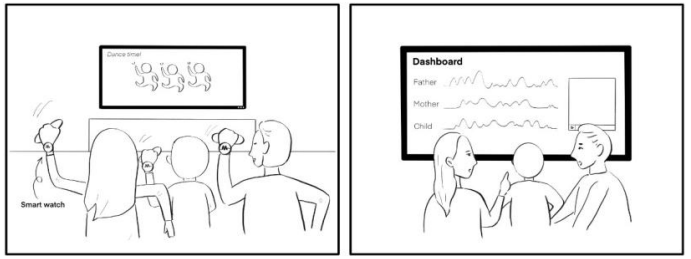
Guests' Rights

"Guests such as ***friends or nannies have rights over their recorded data****,* ***but they're not contributors to our family data****. They don't count as a member of the group data."* (Family 1 - Father)

03 Individual attribution and contribution

Personal Origin with Shared Review

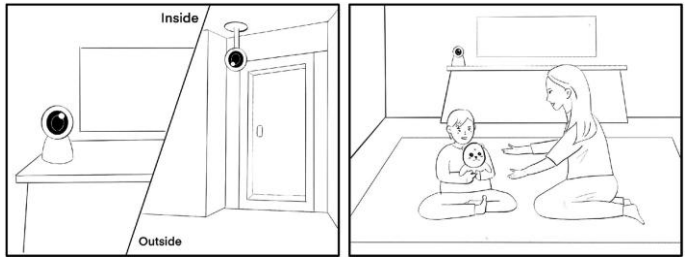
"*We **look at the (health) data together** as a family, but each record **still comes from a specific person's device**.*"
(Family 4 - Son)



Personal health records viewed together

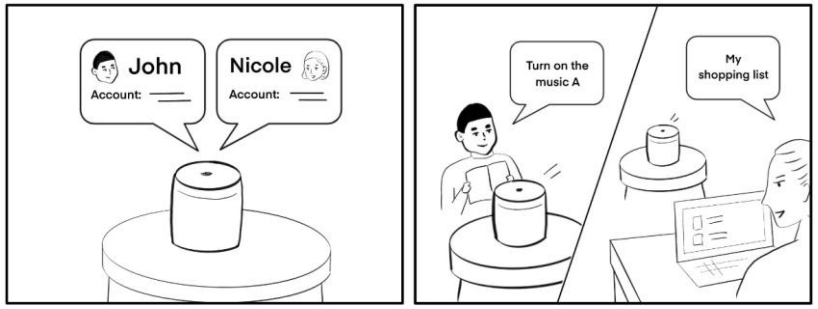
Meaningful Individual Contribution

*"If I'm the **only one dancing in front of the smart camera** while other **family members are passing by**, it feels like **I'm the only one contributing to the data**."*
(Family 9 - Daughter)

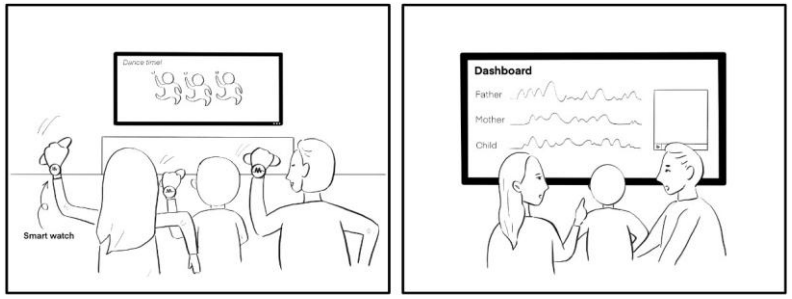


A child dances as others pass by

04 Use purpose and context



Solo searches or music



Joint family games

Personal Purpose

"Even if the speaker is in shared spaces like living room, ***it's personal data if the purpose was individual use****."* (Family 8 - Daughter 2)

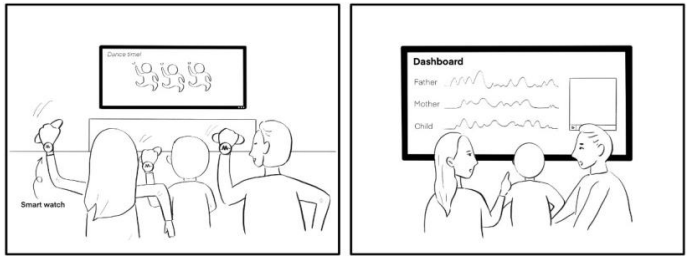
Family-Oriented Purpose

"If the activity with the device involves family activities or the device is shared with other family members anyway, ***it's family data no matter what****.* ***Even if one person's footage is captured****…"*
(Family 4 - Father)

05 Technical definitions and data accessibility

System Aggregation

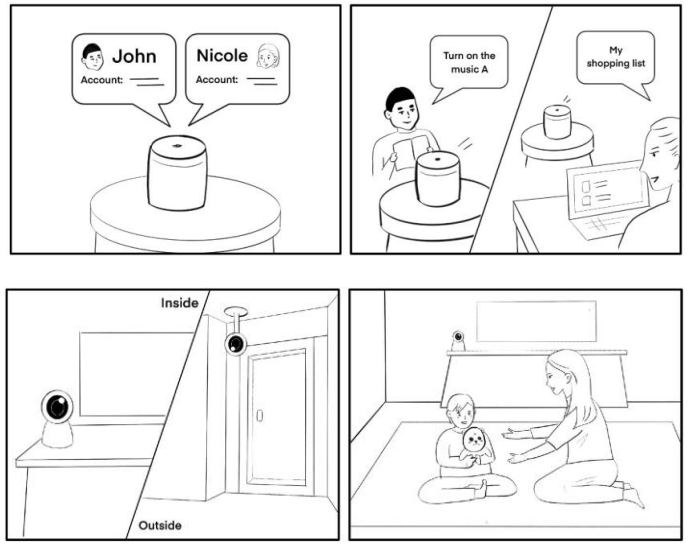
*"Family health data feels like the **sum of each person's data**. It's **grouped by the system**, not because we created it together."* (Family 2 - Father)



A system groups individual health records

Family Access

"If everyone in the family can access it,
then it becomes family data.
Who made it, who's in it don't matter." (Family 4 - Mother)

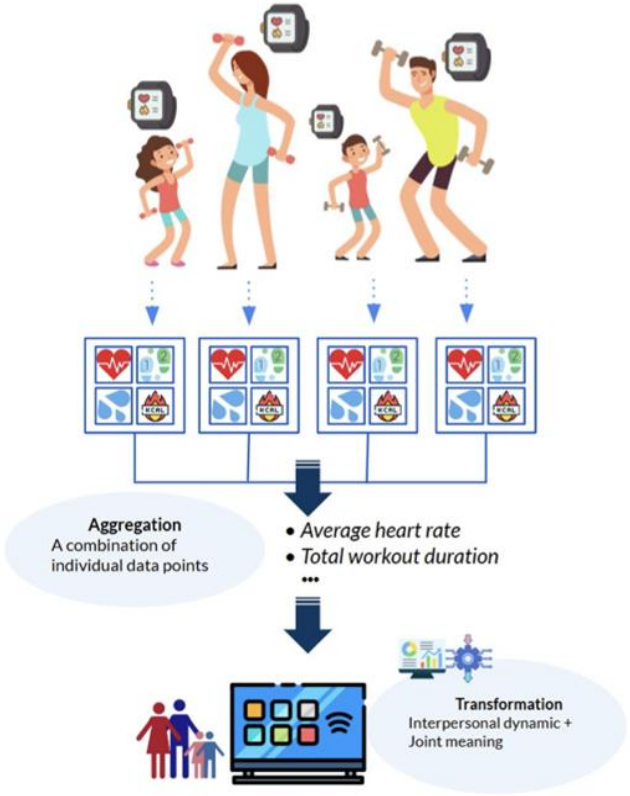


All family members can access the data

Three forms of OurData

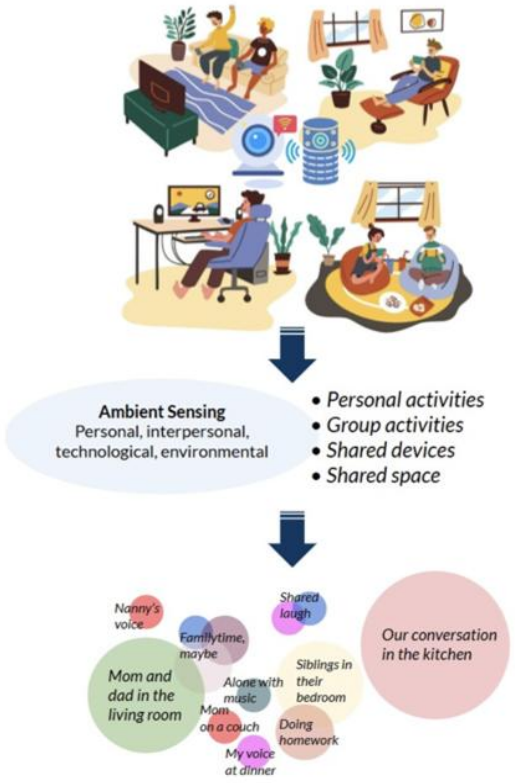
Proactive Interpersonal Data

Created through intentional joint activities.
e.g.: family exercise



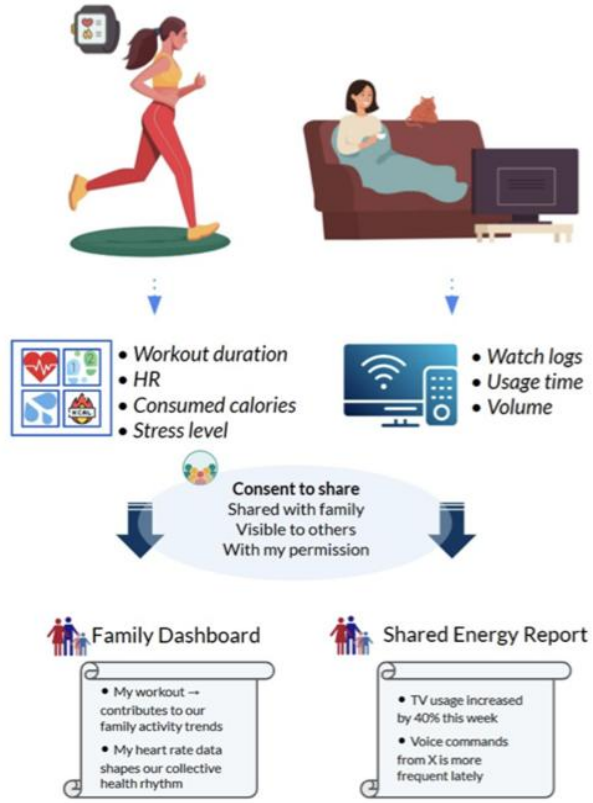
Ambient Co-produced Data

Generated via everyday life in shared spaces.
e*.g.: Home recordings of family routines.*



Shared Personal Data

Individual records made visible or useful to others.
e.g., Personal health data used for family care.



Three forms of OurData

Proactive Interpersonal Data
Created through intentional joint activities.
e.g.: family exercise

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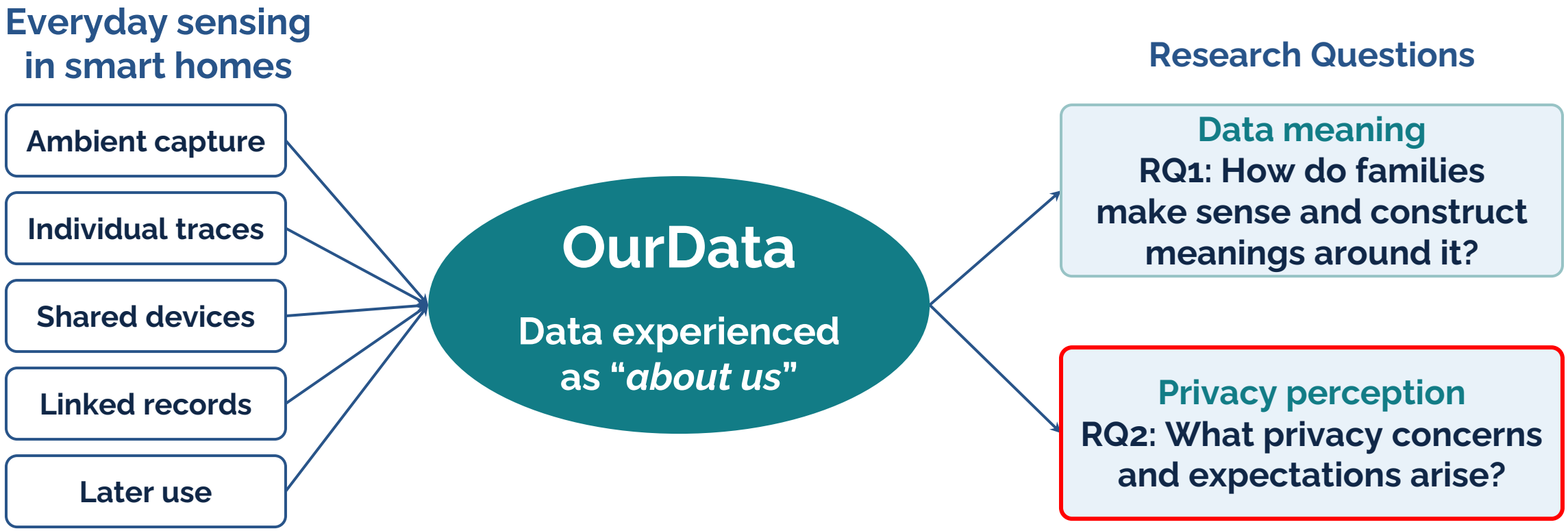
Shared Personal Data
Individual records made visible or useful to others.
e.g., Personal health data used for family care.



Collective meaning can coexist with individual origin and personal privacy stakes

But calling data "ours" does not settle who should be able to access it

OurData: A Relational View of Sensing Data



Perceived sensitivity and collective relevance



Health data: Sensitive and collective in family care - Shared relevance did not remove sensitivity.

"Even if it's an ***individual's health data****, lots of* ***healthcare services often summarize family data*** *as well.*
From then on, physiological data are not just personal figures*,* ***but it's about our family and becomes ours.*** *"* (Family 1 - Father)

Perceived sensitivity and collective relevance

Audio/Video data tension: Highly sensitive with shared visibility

"We bought the device for family use and we put them in the living room. ***So the produced data belongs to all of us, even if all of us are not in the footage****. But still,* ***it feels creepy that someone else will be able to check the record later****.."*

(Family 8 - Father & Daughter)



Family-level inference and exposure risks

Identification

Child's health data + family records - - - **Could this identify one family member?**

"*Even anonymized data about my son combined with other family data could identify him.*"
(Family 2- Mother)

Household profiling

Connected-device logs - - - **Could these expose our family's routines?**

"*All these connected devices might overexpose and profile our family routines.*" (Family 6- Father)

Values and social identity

Household conversations - - - **Could these reveal our family's values?**

"*Conversations reflect intentions and values. That's why I see it as family data, not just mine or others'.*"
(Family 7 - Mother)

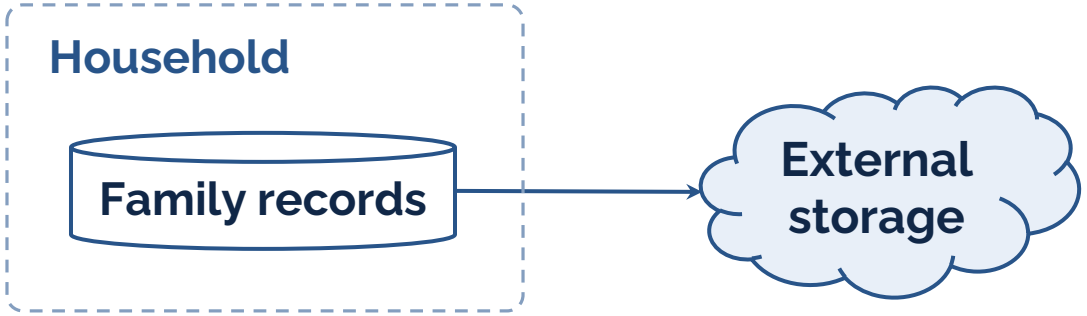
Family interactions

Recordings of family interactions - - - **Could this expose family conflict?**

"*Conflicts or emotions could be recorded unintentionally...*" (Family 7 - Mother)

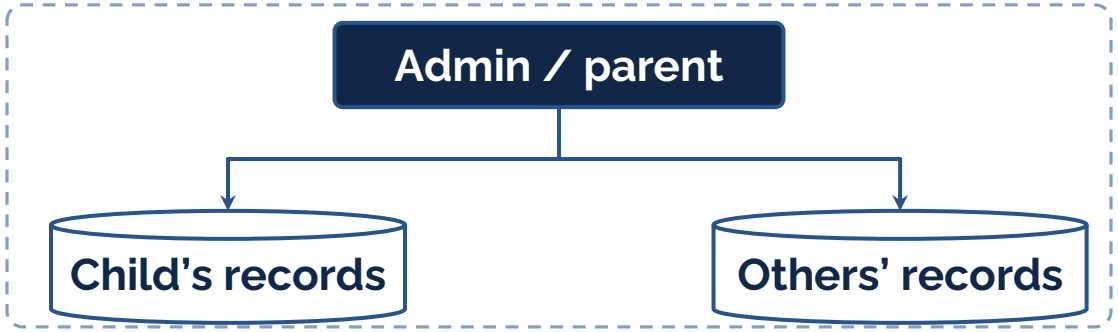
External and intra-family surveillance: Unequal visibility and control

External surveillance



"*I think* ***where and how they store them is not clearly delivered to users****. I'm very concerned about my kids' video footage.*" (Family 10 - Mother)

Within-family surveillance



"It's like ***only one person (account owner)*** *gets to watch everyone else."* (Family 5 - Mother)

"It doesn't feel right that ***my parents get to see my bedroom and what I'm doing 24/7****. It's privacy violation..."* (Family 7 - Boy)

Expectations for managing OurData

Practice	External / institutional	Within the family
Retention	Configurable expiry and minimal long-term external storage	Shorter retention for private moments and children's activities
Storage	Clear storage locations and security practices	Transparent handling, revisiting boundaries as relationships change
Access / control	Limit third-party use. Clarify consent for data about multiple people	Agreement among affected people, including guests and non-initiators

How families reason about OurData

01 Shared meaning through family contexts



"Semi-common"

Individually produced data acquires shared meaning through everyday relationships and use

"Semi-common" means private rights and shared use coexist in the same resource.
For example, land is farmed individually but used collectively for grazing (Ellickson, 2006; Fennell, 2011)

How families reason about OurData

02 Collective exposure



One person's data can expose the wider family

- **Ties:** One person's records can reveal other family members' routines
- **Similarities:** Shared patterns can enable profiling of the household

- **Differences:** Members who differ from household patterns can become easier to identify

How families reason about OurData

03 Ethical Judgment



Ethical questions on data capture and consent

- Who knows about capture?
- Who can object?
- Who bears the consequences?

How families reason about OurData



Shared family care

Shared meaning through family contexts



Collective exposure



Ethical Judgment

OurData connects these interpretations into a relational account of privacy

Designing for ongoing social negotiation

Continuous, contextual consent



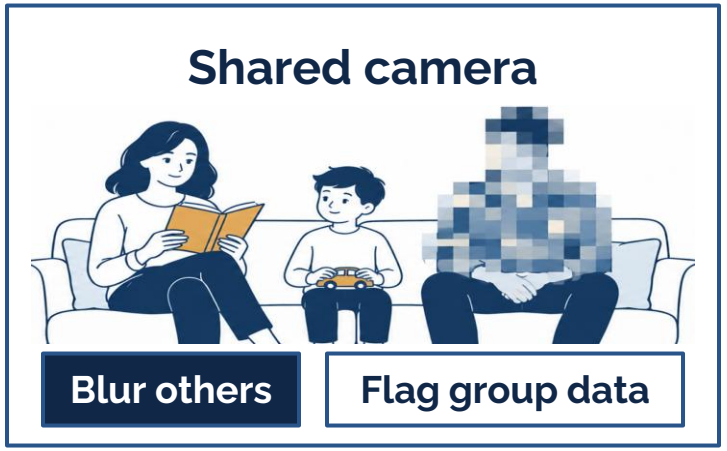
Revisit consent as the shared context changes

Visible social context



Make effects on other people visible

Situated, collective control



Adjust visibility and use during and after capture

OurData

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Our paper

01 FINDING **Family relationships shape data's meaning and privacy**

02 CONTRIBUTION **OurData explains how sensing data becomes "about us"**

03 FOR UBICOMP **Sensing systems should support ongoing negotiation**



Hyunsoo Lee (Usable Privacy & Security Researcher)
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