

# Designing for In-Home Long-Term Family-Robot Interactions: *Family Preferences, Connection-Making, and Privacy*

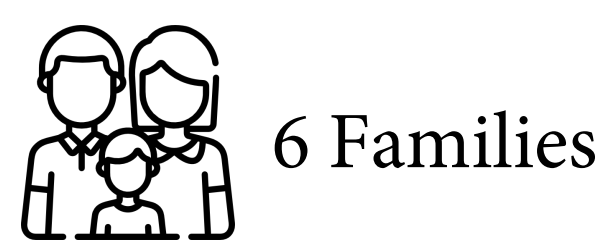
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Motivated by the need for more family-centered approaches in child-robot interactions, the goal of this research is to design in-home social robots that can facilitate interactions between children and family members

## Exploring Family Preferences for Designing Social Robots for Children



6 Families



Children  
age 10-12

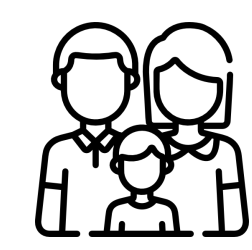


Participatory  
Design Study

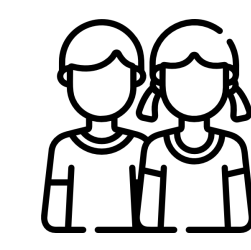
Through participatory design sessions we explored children's and families' design preferences for an in-home social robot and found three key themes [1]  
Families expected:

1. Robots to play two main **roles**: an *assistant* and/or *companion*
2. The robot to be included in **group interactions** and shared recreation activities
3. **Communication privacy concerns** regarding how a robot would manage sensitive information shared in private or group conversations

## One-Month In-Home Deployment of a Reading Companion Robot



14 Families

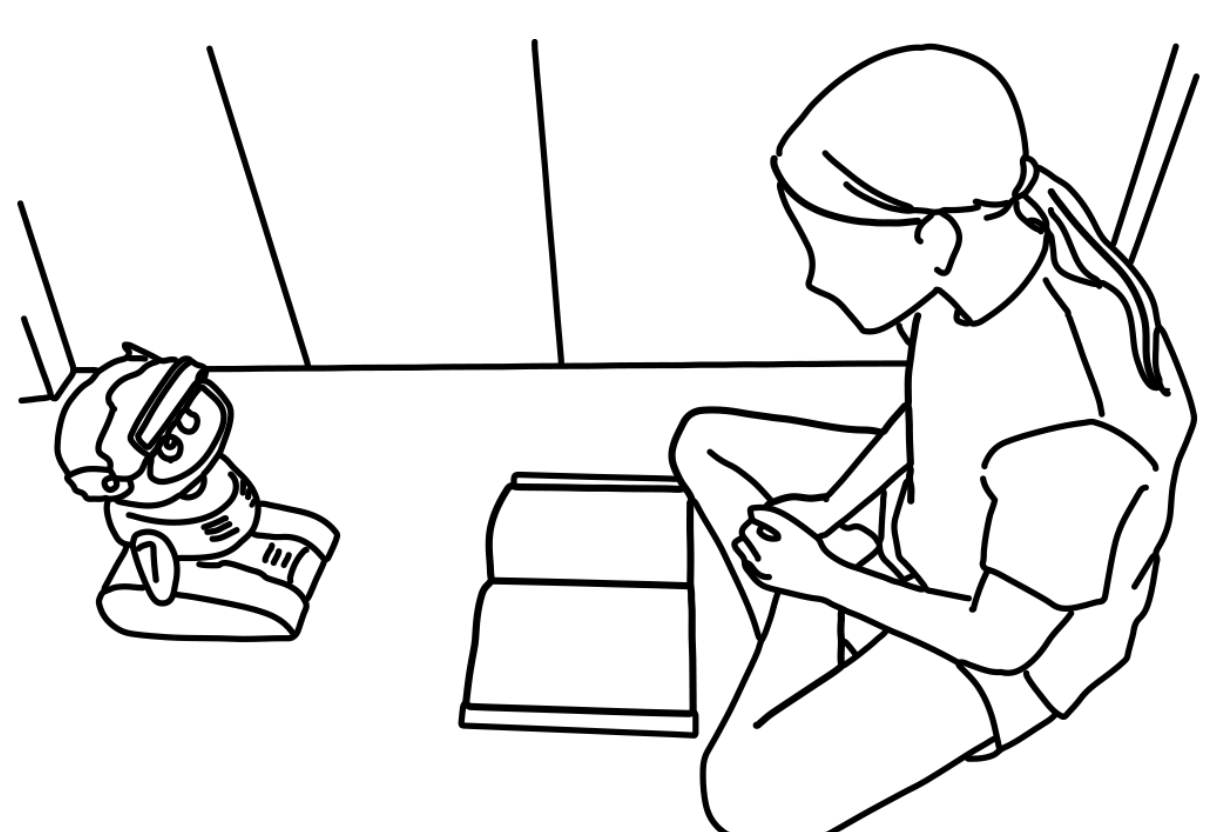


Children  
age 10-12



Field Deployment  
Study

*Children's engagement with the robot categorized as:*

- Modified their interaction (3)
  - Discontinued their use (2)
  - Interrupted more than one week (3)
  - Adopted the robot (6)
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- *External factors* such as vacations, family visits, and extracurricular activities;
  - *Motivational factors* such as family/parental involvement children's individual interests impacted children's engagement with the robot [2]
  - *Video analysis* showed that child-robot interactions go beyond the child
  - Spontaneous and enriching family interactions formed around the robot [3]

## Next Steps and Research Questions

### Prior Work:

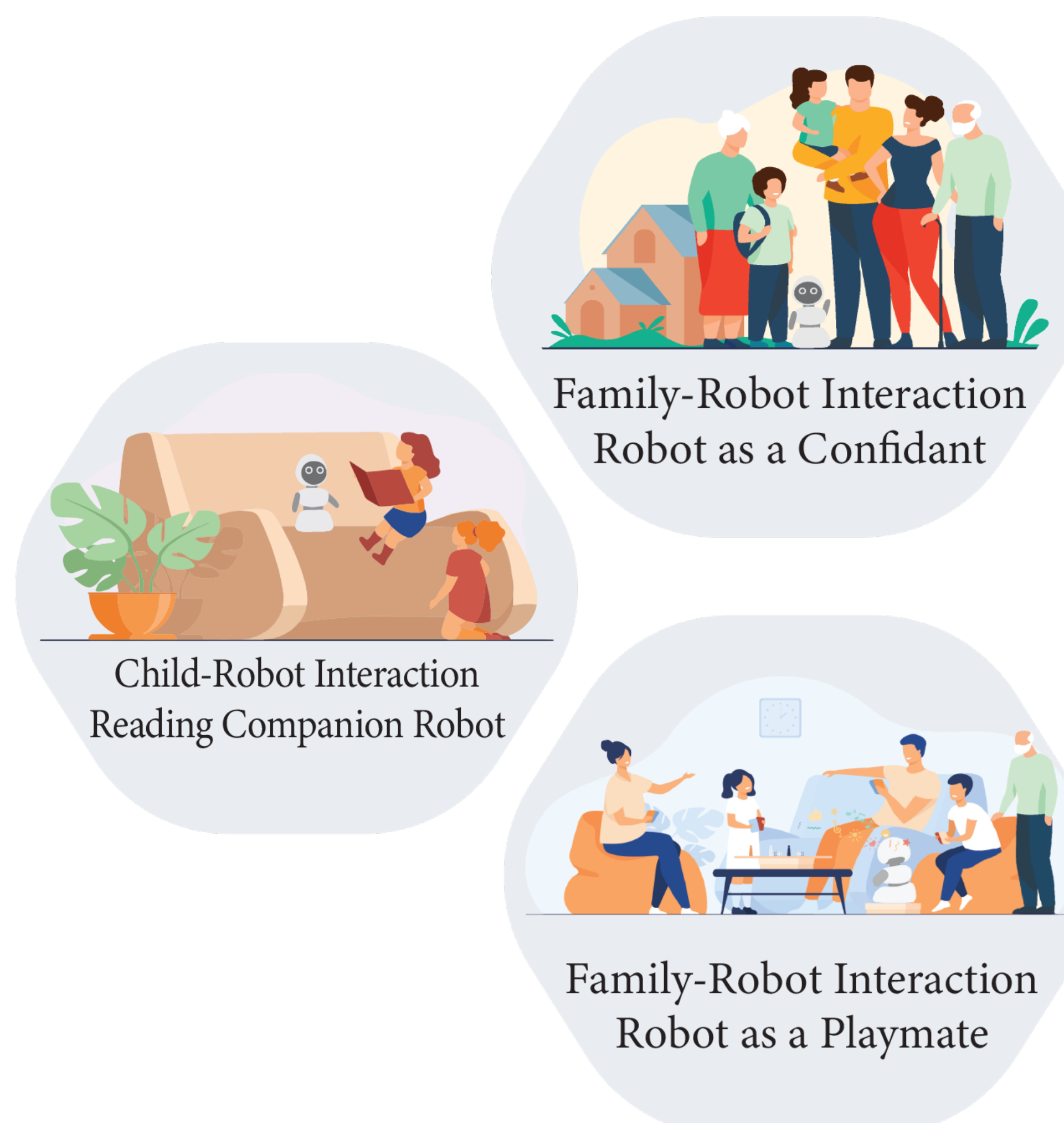
- Designed for child-robot interactions
- Understood *family preferences*
- Focused on the role of a reading companion robot

### Next Steps:

- Design for in-home family-robot interactions
- Support families' *connection making*
- Mitigate families' *communication privacy concerns*
- Use a family-centered approach and theoretical knowledge from interdisciplinary fields [4, 5, 6]:
  - Family Systems Theory
  - Family Ecological Model
  - Communication Privacy Management Theory

### References

- [1] Bengisu Cagiltay et al. 2020. *Investigating family perceptions and design preferences for an in-home robot*. ACM IDC'20.
- [2] Bengisu Cagiltay et al. 2022. *Understanding Factors that Shape Children's Long Term Engagement with an In-Home Learning Companion Robot*. ACM IDC'22.
- [3] Joseph Michaelis, Bengisu Cagiltay et al. 2023. "Off Script": Design Opportunities Emerging from Long-Term Social Robot Interactions *In-the-Wild*. ACM HRI'23.
- [4] Murray Bowen. 1966. *The use of family theory in clinical practice*. Comprehensive psychiatry
- [5] Mary P Andrews et al. 1981. *An ecological approach to study of the family*. Marriage & Family Review
- [6] S. Petronio. (2017). *Communication privacy management theory: Understanding families*. Engaging theories in family communication.



### Research Question 1:

How a robot, acting as a confidant, can mitigate communication privacy concerns between family members?

### Research Question 2:

How a robot, acting as a playmate, can facilitate family interactions and connection-making during a shared recreational activity?

