Designing for In-Home Long-Term Family-Robot Interactions:

Family Preferences, Connection-Making, and Privacy

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Exploring Family Preferences for Designing Social Robots for Children







Participatory
Design Study

Through participatory design sessions we explored children's and families' design preferences for an inhome 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. Conversational privacy concerns regarding how a robot would manage sensitive information shared in private or group conversations.

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.

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



16 Families

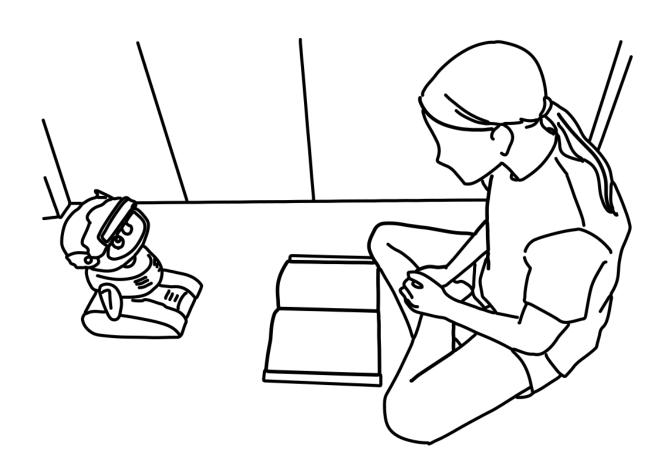




Field Deployment

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).



- 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

Our prior work focused on understanding family preferences and designing child-robot interactions, primarily for the role of a reading companion robot.

For a family-centered approach, our future work will focus on designing in-home family-robot interactions to support families' connection making and to mitigate their communication privacy concerns. Future work will also incorporate theoretical knowledge from interdisciplinary fields [3, 4, 5]:

- 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.





Family-Robot Interaction Robot as a Playmate

RQ1:

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

RQ2:

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







