

Teaching Communication to Children with Autism

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Problem Statement

Autistic children have difficulties in initiating and ending conversations and being a part of a social group. They need assistance to learn such skills. Technology can help them enhance their behavioral and social skills. The purpose of our project is to help children with Autism to build such skills using technology.

Contextual Inquiry

Conducted 30-minute semi-structured interviews with Speech-pathologists at UNMC.

- Interview questions included: experiences with autistic children, characteristics of autistic children and challenges faced in using technology in therapy sessions.

Conducted interviews in therapy rooms:

- Allowed us to observe them in their working environment
- Allowed us to see and physically interact with technology used in therapy.

Considering the age group of the children, we found that we had to come up with something:

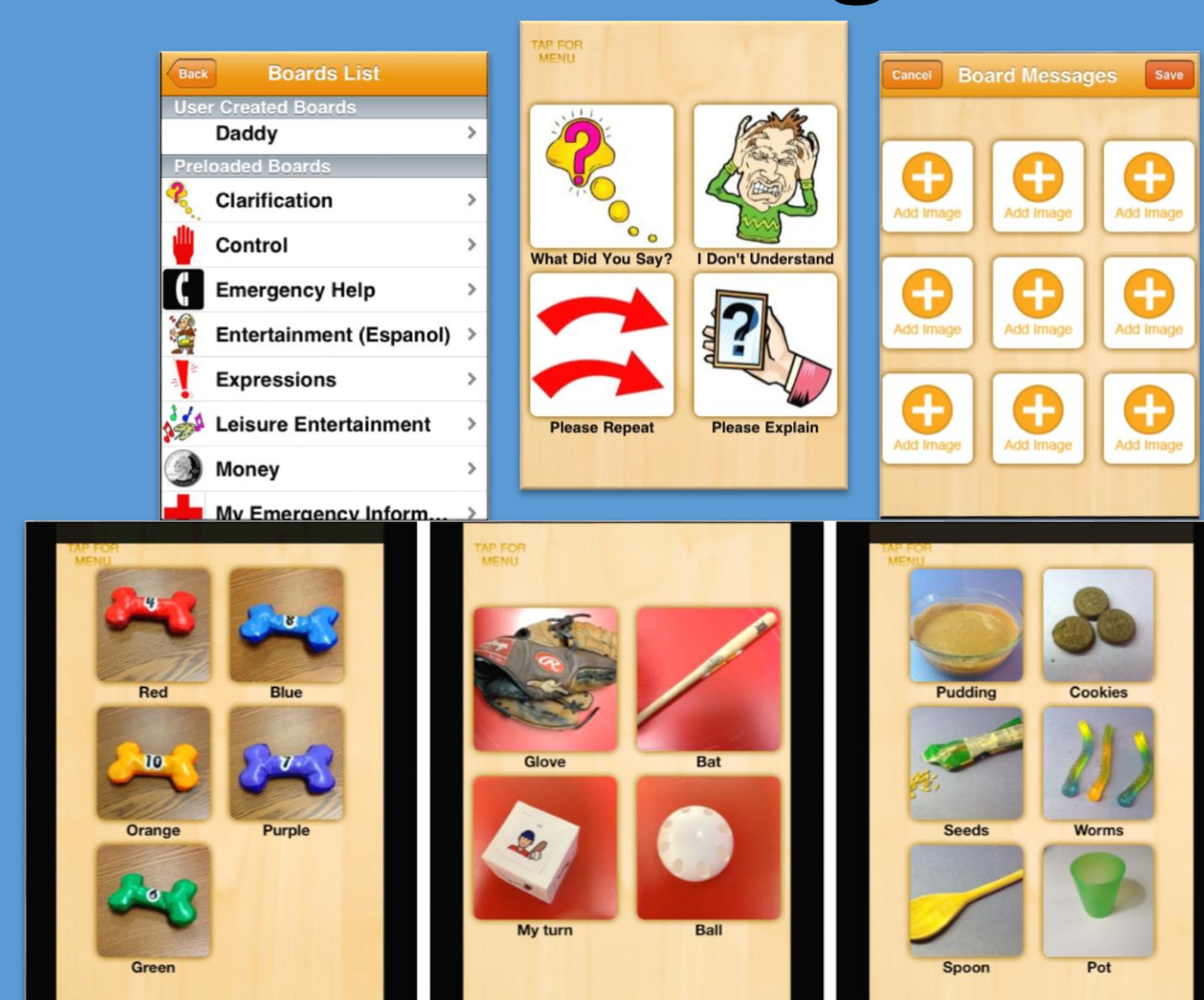
- Did not involve touch screens
- Could motivate and a something a child could enjoy in the first place
- Grows with the child
- Keeps caretakers informed about a child's progress

Competitor Analysis of existing technology and apps:

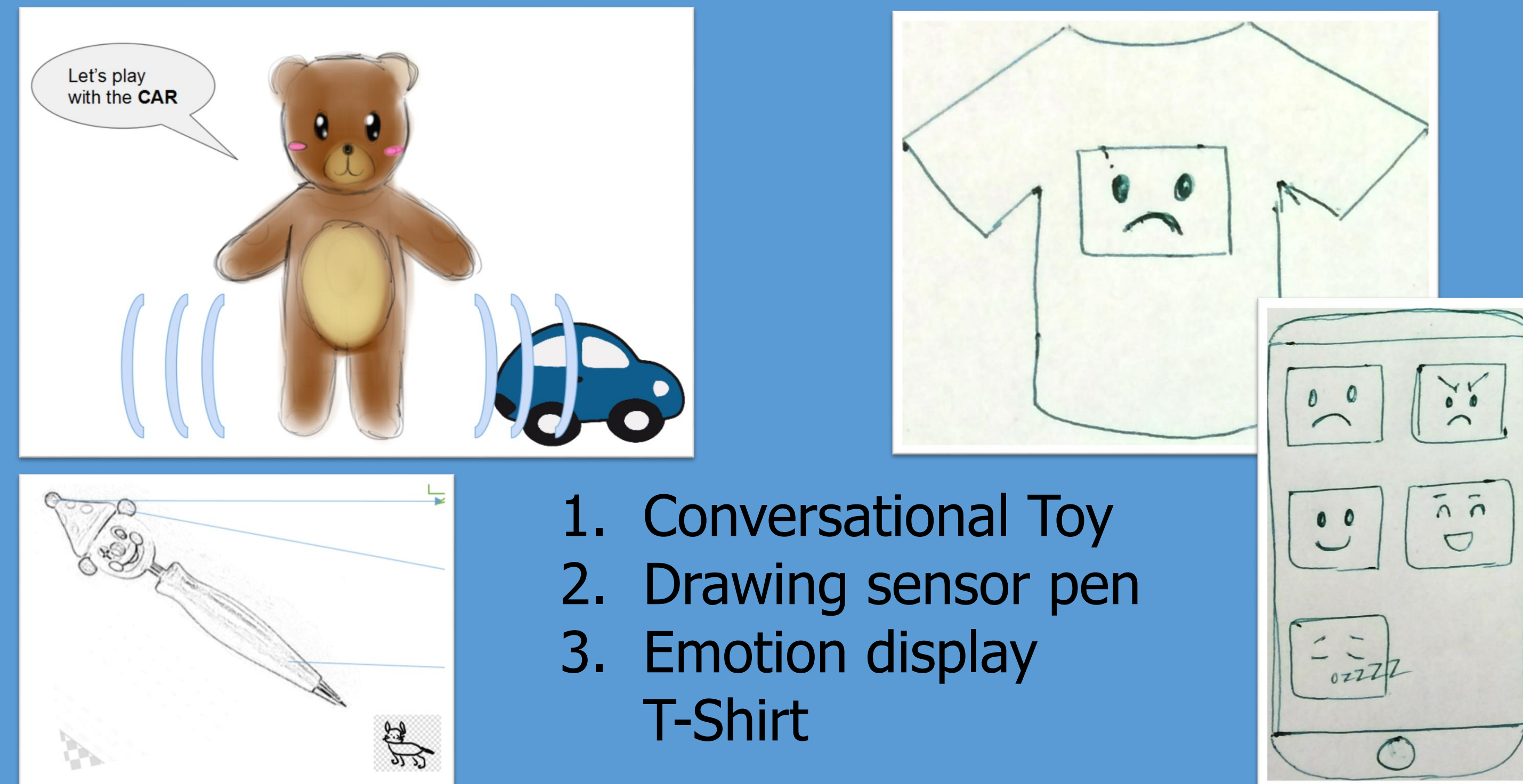
TouchChat



SoundingBoard



Design Alternatives



- Conversational Toy
- Drawing sensor pen
- Emotion display T-Shirt

Prototype



- 6 touch sensors
- Play voices for conversations
- Can be controlled remotely
- Report if "bad" touch happened and play a sound
- Utterance and touch report
- Change voice settings

Evaluation

Goals

- Determine the toy's potential to **grab the child's attention**
- Determine **usability** issues with the toy
- Determine **accurate interpretation** of the child's behavior through reported data
- Determine if layout and workflow is **easy to understand** for a caretaker to prompt the child, generate a response, and input data about the interaction

Participants

Children (>3 years old) with ASD

- Slightly verbal or non verbal child on autism spectrum
- Motor skills to grab or touch

Caretakers

- Therapists: Experience working with non verbal children
- Parents: Has a nonverbal child with ASD

Tasks (1 hour total)

- Present toy to the child with and without prompting conversations
- Caretaker controlling the toy
- Changing voice settings to match the situation
- Interpreting the touch report and utterance report

Setting

A therapy room (ex: at Roskens Hall, UNO) modified to serve as a "lab setting"

References

- Westeyn, T. L., Kientz, J. A., Starnier, T. E., & Abowd, G. D. (2008, June). Designing toys with automatic play characterization for supporting the assessment of a child's development. In *Proceedings of the 7th international conference on Interaction design and children* (pp. 89-92). ACM.
- Kientz, J. A., Arriaga, R. I., Chetty, M., Hayes, G. R., Richardson, J., Patel, S. N., & Abowd, G. D. (2007, April). Grow and know: understanding record-keeping needs for tracking the development of young children. In *Proceedings of the SIGCHI conference on Human factors in computing systems* (pp. 1351-1360). ACM.
- Robins, B., Dautenhahn, K., & Dubowski, J. (2006). Does appearance matter in the interaction of children with autism with a humanoid robot?. *Interaction Studies*, 7(3), 509-542.