

# Supporting Noise Sensitivity and Emotion Regulation with Children

**EMANI DOTCH, UNIVERSITY OF CALIFORNIA IRVINE, USA**

CO-AUTHORS: J. HU, A. MAVROVOUNIOTI, W. DU, J. JOHNSON, E. ANKRAH, A. MIN, G.R. HAYES

UNIVERSITY OF CALIFORNIA, IRVINE, USA

## Introduction

Children who are noise sensitive may be easily distracted, experience discomfort, and **react with negative emotions in the presence of loud or sudden sounds and in environments where they cannot control the noise**; this can impact their ability to regulate their emotions. By conducting co-design sessions with noise-sensitive children, we will better **understand how we might design an assistive application to support emotion regulation in noise-sensitive children**.

## Workshop Methods

### Session 1:

- Storytelling activity using Story Cubes
- Affinity diagraming with stickies to identify specific characteristics, attributes, contexts, and forms of challenging noises described by the participants.
- Sketching with sticky notes to draw or write down solutions for addressing their challenges with noise.
- "Show and Tell" discussion

### Session 2:

- Storytelling activity about their experiences of noise sensitivity
- Card sorting and scenarios to understand how they manage noises
- Fictive Narrative and Bag of Stuff to create low-fidelity smartwatch or mobile phone apps.
- "Show and Tell" discussion

## Online Forum Analysis

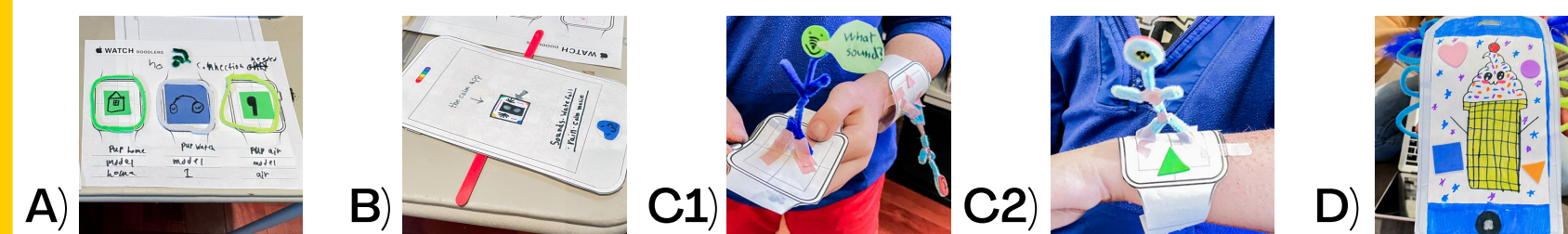
We qualitatively analyzed posts and comments from two online forums to explore noise sensitivity and its challenges. We identified **three themes: describing experiences, managing sensitivity, and disclosing sensitivity**. The forum users shared personal stories about their noise sensitivity, strategies for coping, and experiences disclosing their noise sensitivity. Inspired by the stories shared on the forums, we incorporated **storytelling as a method for our co-design workshops**. Additionally, we incorporated specific sounds, locations, and coping methods from the forum discussions into the design activities.

## Findings

**Personalization** to allow end users to add new coping strategies expands the potential support and promotes a child-centered therapeutic approach.

**Gamification** elements such as levels, challenges, and a point or token system can motivate children to manage their reactions through gamified self-regulation.

Implementing **self- and co-regulation modes** allows for independence and autonomy while providing support for those who need it.



Session 2 Prototypes: A) Smartwatch app with three modes for use B) Use the Calm app plus an interactive user interface C1 and C2) Model 1 and Model 2 of a smartwatch app that cancels out noises using beams D) interactive app that creates an ice cream blizzard to block out the noise around you.

## Future Work

We will conduct additional workshops with children who are noise sensitive while iterating on our current app design. Additionally, we will conduct a four-week pilot study to evaluate the app's effectiveness in supporting self-regulation among children facing noise and emotion regulation difficulties.

## Acknowledgments

This research is supported by the National Science Foundation Graduate Fellowship under Grant No. DGE-1839285 and support from the Jacobs Foundation CERES Network.