Role of Voice and Accessories in Gender Perception of Social Robots

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DESIGN STATEMENT

Are children able to perceive a gender identity or stereotype from voice and accessories, like clothing? If so, can they perceive a gender identity or stereotype from a social robot from its appearance, voice, and/or accessories?

WORKSHOP DESIGN

Workshop Setup
- This workshop can be held in-person in the WonderLab Science Museum at Bloomington, IN, and can be hosted for about 1 hour to 1 hour and 30 minutes
- Ideally, we would want an even number of child participants, half male and half female.

Part 1 – Children's Gender Perception of Voices and Clothing
- For the first part of the workshop, we want to assess how children perceive voices and clothing and if those perceptions are impacted by gender.
- This serves to see if children perceive gender through voices, clothing and possibly profession regardless of a social robot being involved or not.

Step	Tasks	Tools
Gender Identity Discussion	Teach children about gender identity	Gender Identity Explanation Video
Gendered Voices	Present children a set of 6 robot voices: - 2 feminine voices, 2 masculine voices, 2 neutral voices Ask the participant to categorize the voices as either: - Male, Female, Nonbinary, Open-Ended Ask for reasons why	Set of voices
Clothing	Present children a set of clothing with various colors and designs, including: - Suits and Dresses, Informal, Formal/Work clothes, Etc Ask the participant to categorize the clothing as either: - Male, Female, Nonbinary, Open-Ended Ask for reasons why	
Clothing Discussion	Ask the participant to tell us what the associate these clothes with, i.e. profession, character, and explain why	

Part 2 – Social Robots and Gender Identity
- For the second part of the workshop, we want to assess how children perceive social robots, such as Haru and QT, and their appearances and voices are impacted by gender.
- This serves to see if children can perceive gender from a social robot, and if that perception is impacted by their appearance, voice, and/or clothing accessories.

Introduction to Haru and QT robots	Introduce the appearance and functionality of the Haru and QT robots	Pictures and GIFs of Haru and QT
Haru and QT Appearance	Ask the participant what Haru and QT look like Ask the participant if they assign a gender to Haru and QT and ask why	
Haru and QT Voices	Assign Haru and QT one of the voices from previous step - Each robot voice will be unique Ask participant to assign gender to robots: - Male, Female, Nonbinary, Open Ask for reasons why	Video of Haru and QT with gendered audio
Dress-up	Ask participant to clothe both robots based on that voice and explain their choices	
Discussion	Ask them to make a scenario/story of Haru and/or QT about their day and ask to explain why they gave them that story	

MOTIVATION / USER RESEARCH

Picture of Social Robot Haru

Gender expectations often impact how objects are designed, such as social robots. For example, the social robot Sophia, a human-like robot developed by Hanson Robotics, is designed to have a feminine appearance and voice. She is also given she/her pronouns from Hanson Robotics themselves. As stated by her developers, she was "created to help people" with "medicine and education", along with being referred to as a "personal assistant". The role of an assistant is often considered feminine, as portrayed in popular media. Along with this, a similar robot called Little Sophia, a small robot with Sophia's likeness, was developed to teach children programming. Similar to assistants, the role of a teacher, especially young children's teachers, is often considered feminine.

Along with this, how a robot is anthropomorphized with a gendered voice impacts how people interact with and perceive the robot. For example, a study by Siegal et al. (2009) ran an experiment where participants were asked by the Mobile Dexterous Social (MDS) robot to donate money towards research. However, the robot's voice differed for each participant, being either a masculine voice or a feminine voice. The study found that male participants were more likely to donate to the feminine-voiced robot, while female participants showed little preference for either voice. They also found that participants preferred the robot with the voice opposite their gender, with men finding the female robot more trustworthy and engaging. Another study by Schermerhorn et al. found that men are more likely to treat a robot as a social entity, while women view a robot as a machine. This means there's reason to believe how a robot is gendered, such as how their voice sounds, will impact HRI between people.

According to Nagels et al. (2020) Children are also able to categorize gendered voices, such as male and female voices. They also have a different interpretation of gendered voices, as theirs could be based predominantly on other children's voices. I'm also motivated by how accessories to a social robot, such as clothing, could affect how people, especially children, interpret and perceive a social robot. Each social robot has a physical appearance that can affect perceptions but will additional human clothing contribute to those perceptions?

ASPECTS

- Children's gender perception of robot voices
- Children's gender perceptions of robot clothing
- Children's anthropomorphism of robots
- Children's explanations of gender identity and social role of robots
- Role of appearance with perception of robots
- Human-Robot Interactions

PROCESS

Implementation:
- Selecting social robots
  - Chose Haru and QT
    - Selected for their differences in appearance.
    - QT is humanoid in appearance, while Haru is not.
    - Appearance may impact how the participants perceive the social robots.
- Workshop interactivity
  - We want to make sure the child participants are engaged the full time.
    - Chose to make children play dress-up with the robots, along with giving the robot a story of their day.
    - Can allow us to see how they dress up each robot based on voice they have, along with what story they give the robot.

Challenges:
- Children may not know many professions.
  - Professions like teacher, firefighter, and doctor are going to be more recognizable that professions like assistant director.
  - Can this impact steps in the workshop?
- How do we make clothes for the robots?
  - Haru and QT have different designs.
  - How many clothes should we make? What materials to use? What types of clothes should be available?
- Will children understand gender identities and expressions outside male and female?
  - Could this limit their responses involving non-binary identity or bigender identity?
  - Wil explaining gender identity be enough?
- Are there any gaps in our research about HRI with children?
  - Ex: how do children perceive these social robots outside their intended role?