Imagining human–robot encounters

Youth narratives and commonsense understandings of social interaction with Pepper robot

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As social robots enter public spaces, there remains a gap in understanding how people imagine and evaluate their roles as social actors. This study explores the social dynamics of human-robot interaction (HRI) using the Method of Empathy-Based Stories (MEBS). Participants imagined encounters with a robot at a youth center, producing 158 stories that reveal culturally situated reasoning grounded in everyday social expectations. Positive interactions were marked by the robot's ability to "pass as social", where adherence to interactional norms enabled smooth exchanges despite technological limitations. In contrast, negative stories exposed failures such as unresponsiveness, rudeness, or lack of social competence, leading to distrust or disappointment. These findings underscore the situated nature of HRI, suggesting that successful interaction depends less on a robot's "real internal states" and more on its capacity to align with normative expectations of context and practice.

Keywords: empathy-based stories, human-robot interaction, qualitative research, socially interactive robots, youth

1. Introduction

Human–robot interaction (HRI) has developed into a multidisciplinary field uniting engineering, psychology, design, and social sciences. As Bartneck et al. (2024) observe, the field increasingly addresses not only technical but also socio-emotional aspects, emphasizing context, user expectations, and human interpretation. Social robots are designed to interact with humans, from passive emotional cueing to active engagement (Fong et al., 2003). This study focuses on socially

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interactive robots that mimic human interaction through embodied cues (Deng et al., 2019). Understanding how people perceive or imagine such interactions is crucial for broader societal adoption (Alenljung et al., 2017; Lindblom & Andreasson, 2016), particularly since encounters with these technologies remain rare (David et al., 2022). Defining appropriate societal roles for these machines is equally important.

HRI research on socially interactive robots combines quantitative and qualitative approaches. Psychological experiments assess the impact of social cues (Ghazali et al., 2018), while ethnographic studies explore longer-term use (de Graaf et al., 2015). Yet real-world studies are constrained by limited robot capabilities and societal presence. Exploring imagined interactions offers an alternative for accessing people's expectations and concerns. This is especially useful with adolescents, who are creative and articulate (Fitton et al., 2016) but remain underrepresented in HRI research (Björling et al., 2018), despite their deep involvement in sociotechnological change (Dahl et al., 2018). The concept of "youth" varies across research and policy contexts. The Finnish Youth Act (1285/2016) defines young people as individuals under 29 years of age, while international frameworks such as those used by the United Nations typically define youth as ages 15–24 (United Nations, Department of Economic and Social Affairs, 2018). In this study, "youth" refers to participants aged 15–29 years, the age range being based on Finnish research and policy contexts.

This study investigates how young people envision interactions with socially interactive robots in youth-centered spaces like youth centers. Instead of providing direct design recommendations, the study examines culturally shared expectations that shape imagined encounters with social robots, focusing on how young people evaluate interaction in relation to familiar social norms and situational expectations. A related study has demonstrated the potential of literary products in revealing perceptions about robotics (Wang et al., 2023).

To our knowledge, this is the first HRI study in the international research literature to apply the Method of Empathy-Based Stories (MEBS) (Särkelä & Suoranta, 2020; Wallin et al., 2019). In this study, MEBS is used to access young people's commonsense expectations and evaluations regarding interaction with a social robot in a youth center context. The approach invites participants to write narratives based on fictional scenarios involving a robot, leading to either positive or negative experiences.

The research questions are:

– RQ1: What aspects of human-robot interaction are associated with positive or negative experiences in the stories?

– RQ2: From a human perspective, what robot characteristics are seen as enabling or limiting their role as interaction partners?

Section 2 reviews prior research on youth expectations and experiences with socially interactive robots and outlines the key conceptual perspectives on social interaction that inform the analysis. Section 3 describes the MEBS method, data collection, and analysis. Section 4 presents the findings, followed by a discussion of implications and limitations in Section 5. Section 6 concludes the paper.

2. Background

2.1 Socially interactive robots and human-robot interaction

Social robots are defined as machines designed to interact socially with humans in everyday environments (Breazeal et al., 2008). A specific subtype, socially interactive robots (Fong et al., 2003), display "human social" traits and communicate through speech, gestures, facial expressions, gaze, and digital displays (e.g., tablets). These robots are expected to act as social partners or perform tasks in human settings (Fong et al., 2003; Matarić & Scassellati, 2016). Applications include mental health and well-being (Alves-Oliveira et al., 2022; Axelsson et al., 2025), where affective robotics, i.e. robots recognizing and responding to human emotions, is particularly relevant (Spitale & Gunes, 2022). People can often discriminate empathy from robots' verbal and facial expressions (Leite et al., 2013). Social robots have also been studied in language learning (Derakhshan et al., 2024) and education (Woo et al., 2021), where they inspire discussions on robotics and AI (LeTendre & Gray, 2024).

Robots vary in embodiment, from mechanical to zoomorphic or anthropomorphic forms, designed to support intuitive interaction via recognizable social cues (Deng et al., 2019). However, expectations of humanlike robots often exceed their actual capabilities (Haring et al., 2018; Kwon et al., 2016; Rosén et al., 2022), influenced largely by media (Horstmann & Krämer, 2019; Sandoval et al., 2014). People tend to apply familiar human communication patterns during HRI (Edwards et al., 2019; Jarske et al., 2020), leading to mismatched expectations and negative experiences when robots fail to meet them (Kwon et al., 2016; Jokinen & Wilcock, 2017; Komatsu et al., 2012; Schramm et al., 2020).

While media often exaggerate robot abilities, some users underestimate them, such as not expecting conversational ability even when such capabilities are present (Rosén et al., 2022). Positive experiences arise when expectations align with actual capabilities, even if limited (Jokinen & Wilcock, 2017; Rosén et al., 2022).

Speech interaction is typically expected with anthropomorphic robots, but users may still struggle to understand how to engage them (Thunberg & Ziemke, 2020). Social robots must adhere to turn-taking practices to support human-like interaction (Kahn et al., 2008; Skantze, 2021). Studies that adopt ethnomethodological conversation analysis have examined how people practically orient to social robots in public settings (e.g., Rudaz & Licoppe, 2024; Tisserand et al., 2024), and bring into attention the collaborative practices and interactional work that people do to adjust to the interaction with social robots (Jarske, Raudaskoski et al., 2025), such as managing normative violations (Majlesi et al., 2023), conversational repair (Stommel et al., 2022), and recipient design (Tuncer et al., 2023).

2.2 Young people and social robots

As novel technologies, social robots often evoke curiosity and interest (Kaipainen et al., 2020), but responses range from excitement to fear and distrust (Mubin et al., 2020). While novelty has been considered a confounding factor in HRI studies, it can also offer insights into human–robot relationships (Smedegaard, 2019). Novelty should thus be seen as a dynamic aspect of user experience (Abendschein et al., 2022; Smedegaard, 2019). Adolescents are particularly drawn to novelty and exploration (Dahl et al., 2018), making their perceptions of socially interactive robots especially significant.

Perceptions of robots and HRI are shaped by personal experiences, media portrayals, and cultural narratives. Although direct interactions with robots remain rare among adolescents, studies show their attitudes mix curiosity and enthusiasm with caution (Kaipainen et al., 2020; Björling et al., 2020). For instance, robots designed to reduce stress and provide emotional support have been positively received (Björling et al., 2020). Yet Fenech et al. (2020) found youth may hesitate to accept robots in workplaces due to fears. Data privacy is another concern, particularly regarding how robots store and use information (Ahtinen et al., 2023; Björling et al., 2019; Levinson et al., 2024).

In a scenario evaluation study exploring robots' roles, young people expressed strong dislike for "pretentiousness", meaning emotional expressions perceived as unnatural or unnecessary, especially when intended to persuade (Kaipainen et al., 2020). Related research (Jarske, Kaipainen & Väänänen, 2025) found adolescents felt uncomfortable sharing personal experiences with robots, viewing them as programmed machines unable to reciprocate or understand. A design study (Jarske, Kaipainen, Ahtinen, et al., 2025) revealed youth found it intriguing to identify "superpowers" in robots — unique abilities beyond human capabilities (Dörrenbächer et al., 2023). Participants also considered whether robots might act as more objective partners than humans.

Wang et al. (2023) studied sixth graders' portrayals of robots in written stories and drawings, categorizing them into four "robot identity" dimensions: nature, social, emotional, and evolutionary. These reflected varied views on robots' societal roles and emotional qualities. The students approached robots with openness and often attributed human-like features to them.

2.3 Social norms, context, and the intelligibility of interaction

This study focuses on robots whose interaction abilities are explicitly modeled after human social behavior. Human interaction involves practices like turn-taking, gaze, and gestures, relying on the recognition and following of social norms (Heritage, 1984). In social robotics, it is argued that for socially interactive robots to be accepted as partners, they must recognize social conventions (Fong et al., 2003) and adhere to norms (Brinck et al., 2016). Effective coordination requires responding to human cues in socially and contextually appropriate ways (Bartneck & Forlizzi, 2004; Breazeal et al., 2008; Dautenhahn, 2007).

Our study draws on ethnomethodological theorizing and prior research on human social interaction that emphasizes the role of shared norms, commonsense reasoning, and situational understanding in everyday interaction. People typically act on the assumption that others share a broadly similar normative framework, which enables social actions to be interpreted as meaningful and accountable within specific situations (cf. Garfinkel, 1963; 1967).

The concept of "member" (e.g. Garfinkel, 1967; Garfinkel & Sacks, 1970) highlights that social participation relies not on individual traits but on practical competence in shared practices. Membership refers to orienting toward norms, where actions are guided by shared understandings rather than individual characteristics. In HRI, this raises questions about whether robots can achieve such membership. Humans often find the robot's membership status and common ground unclear, requiring extra effort to discover its capabilities (cf. Jarske, Raudaskoski, et al., 2025). As Pelikan (2023) shows, such membership is interactionally fragile and situational: robots may be momentarily treated as members, but this status is easily withdrawn when their actions fail to meet commonsense expectations.

The concept of "indexicality" refers to the idea that the intelligibility of practical action cannot be captured by context-free or formally specified descriptions but depends on participants' situated reasoning and their orientation to the specific circumstances in which actions are produced and understood (Garfinkel & Sacks, 1970). This is crucial in HRI, where interpretations depend on context and often emerge spontaneously (e.g., Jarske, 2025). Although our data consists of imagined interaction narratives, the concept of indexicality helps to illuminate

how participants describe and evaluate robot interaction as context-sensitive and situationally grounded.

3. Methodology

This study employed the Method of Empathy-Based Stories (MEBS), a qualitative approach well suited for exploring imagined practices and normative expectations. Participants were asked to write narratives about a hypothetical encounter with a social robot, resulting in either a negative or positive experience. These stories offer insight into what young people perceive as relevant when making sense of interaction with such robots.

3.1 Method of empathy based stories

The Method of Empathy-Based Stories (MEBS) was developed as an alternative to traditional experimental social psychology, particularly in response to ethical concerns raised in the 1960s about manipulative designs (Särkelä & Suoranta, 2020; Wallin et al., 2019). MEBS situates research within text-based settings. Participants are presented with a frame story — a research prompt — and asked to write narrative responses while empathizing with the situation described. Typically, two or more versions of the frame story are used, altering variables like emotional tone or contextual details (Särkelä & Suoranta, 2020; Wallin et al., 2019). This allows researchers to examine how participants imagine events unfolding and what reasoning they attribute to specific outcomes. The method provides a window into possible futures or situations beyond participants' lived experiences (cf. Wallin et al., 2019).

MEBS has been increasingly adopted in research on digitalization, education, and human-technology relations. It has been applied to explore professional identity in workplace digitalization (Wallin et al., 2022), students' imagined futures of digital education (Teräs et al., 2024), and virtual or hybrid learning environments (Annala et al., 2012). It has also informed cross-cultural studies on children's technological expectations (Shu et al., 2022) and examined Generation Z's motivations in technology-driven work contexts (Kutlák, 2020). Furthermore, it has been used to critique techno-solutionism in digital university settings (Lim et al., 2024) and investigate smartphone use in family interactions (Härkönen et al., 2018; Härkönen & Raudaskoski, 2024).

Although MEBS is growing in relevance within technology-related research, it has not previously been applied to imagined human–robot interaction in this way. This study thus represents a novel contribution to both qualitative HRI and

narrative-based methodologies. Our aim was to investigate the types of imagined interactions participants envisioned with a social robot and to analyze the reasoning processes underlying those imaginaries.

To support this, we created two distinct frame stories prompting participants to reflect on a fictional encounter. The variation between stories encouraged them to consider both positive and negative interaction outcomes, as well as the features, behaviors, and contextual factors that might lead to these. Participants were invited to imagine interactional practices, steps, and reasoning processes shaping these results.

MEBS shares similarities with speculative qualitative methods such as role-playing and storytelling (Brunnmayr & Weiss, 2024; Dörrenbächer, 2022). It generates rich narratives revealing qualities participants consider meaningful.

3.2 Study design

3.2.1 *Frame story*

As noted, MEBS often employs two or more versions of a frame story with one altered aspect. For this study, we designed a frame story prompting participants to empathize with a situation where a surprising encounter with a social robot led to either a positive or negative experience. Rather than specifying particular emotions (e.g., joy or sadness), we used the positive/negative distinction to elicit a broader range of emotional responses and more varied accounts of interaction. The frame story was carefully formulated to provide enough context for participants while remaining concise. An image of a robot supported task orientation and controlled for potential variation in expectations about robot embodiment. We selected Pepper,[1] a widely recognized social robot, as the humanoid example. Previous field studies suggest Pepper evokes both positive and negative experiences (Kaipainen et al., 2018; Mubin et al., 2020).

Two pilot studies informed the final frame story. The first pilot tested an initial draft with four university-educated adults via an online form, accompanied by a photo of the Pepper robot. Two participants responded to the positive frame story and two different participants to the negative version. The narratives confirmed the frame story's ability to generate material relevant to the research questions. From this pilot, we noted participants tended to describe surprises during the encounters. We decided to emphasize positive and negative surprises in the revised story, reflecting how social robots, as novel technologies, can challenge expectations and reveal what participants consider "normal" in HRI.

1. https://us.softbankrobotics.com/pepper

Building on prior collaborations with youth services (Kaipainen et al., 2020, 2023), the second pilot tested a youth center setting to enhance relevance for a younger audience. Conducted with LimeSurvey and randomized assignment to positive or negative prompts, the pilot collected four positive narratives from university students, all of whom fell within the study's defined age range of 15–29 years. Although no negative responses resulted from randomization, participants showed clear engagement, supporting the method's potential to produce youth-relevant, socially contextualized insights. To strengthen context, we provided a background for the main character's presence at the youth center. A sketch depicting Pepper in this setting was created (Figure 1).

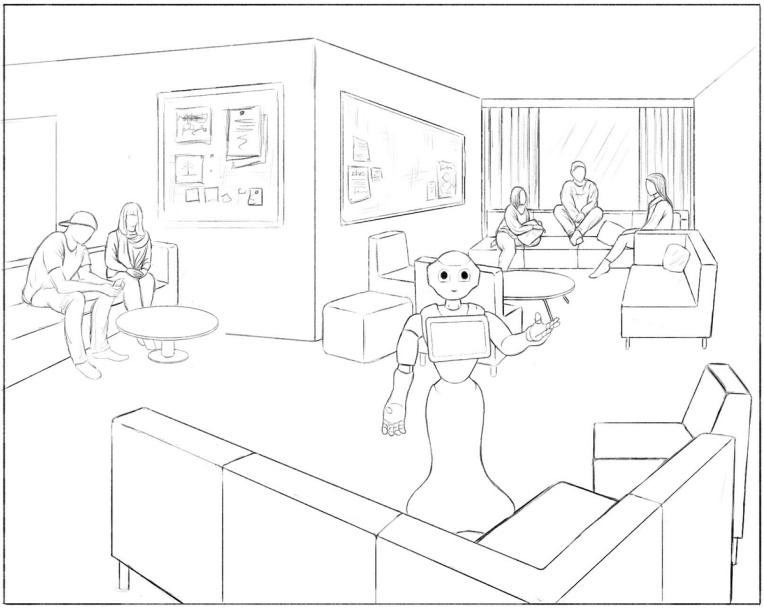

Figure 1. The stimulus image presented to the participants in connection with the frame story

Based on these two pilot studies, we revised the final frame stories as follows (the square brackets indicate the difference between the otherwise identical frame stories):

> Sandy[2] is hanging around at a local youth center. Sandy walks toward a robot that is in the same room. The robot greets them. Sandy is interacting with the robot for a few minutes. Sandy experiences the situation as surprising. Sandy is left with a [positive/negative] feeling. Write a story about what has happened.

The frame story and the image (Figure 1) defined the four basic components for participants' writings. First, the robot is located at a youth center in a general area where other people are present. Second, the robot is humanoid-form with a head, eyes, arms, and a chest-mounted tablet. Third, Sandy notices the robot, approaches it, and the robot greets Sandy, officially initiating the interaction (which likely cued the participants to expect dialogue to take place). Fourth, the interaction happens within a relatively short timeframe, a few minutes, and is a surprising experience that results in either a positive or a negative feeling.

The frame story was written in third person as opposed to first person so that the participant could relate to another person's point of view and focus less on their potential lack of personal experience with social robots. Using third person in the story also allows the participant to imagine possibilities rather than focusing on how they would themselves act (cf. Wallin et al., 2019).

3.2.2 *Data collection procedure and participants*

The data for this study were collected using an online form designed with LimeSurvey software. The form consisted of two main parts: a consent page and the writing assignment. On the consent page, participants were asked to indicate their age by selecting one of four brackets (15–17, 18–24, 25–29, and 30 or above). No additional demographic or background information was collected, as the study did not aim to conduct population-level or attitudinal comparisons. In the context of MEBS research, it is not customary to gather such details unless they are deemed essential for answering the research questions (Wallin et al., 2019).

The writing assignment page presented participants with instructions followed by one version of the frame story. The LimeSurvey software randomized whether participants saw the positive or negative version of the frame story. The instructions were: "Write a story based on the frame story below. Use your own imagination. There are no specific requirements for the length of the story. All kinds of stories are valuable. We will not evaluate the stories based on their grammar or other external characteristics. Happy writing!" These instructions aimed

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2. For this paper, the frame story has been translated from the Finnish language. In the original frame story, we used a gender-neutral name, which has been changed to an English gender-neutral name 'Sandy' here.

to encourage creativity and to lower barriers to participation by assuring students that all responses, regardless of style or length, were appreciated.

Participants were recruited from three groups: ninth-grade students, high school students, and university students in Tampere, Finland. The first data set was collected from students enrolled in a social science course at Tampere University during the spring and autumn semesters of 2021. The second data set was gathered later that year, in autumn 2021, from primary and high schools in the same city. Both data sets were collected before the widespread adoption of large language models (LLMs), which means that the imagined scenarios reflect a pre-LLM era. Participation was entirely voluntary. To motivate younger participants, we offered the opportunity to enter a lottery for movie tickets. Five winners were randomly selected to receive a ticket worth approximately 10 euros. To manage the lottery, email addresses were collected separately and destroyed immediately after the prizes were distributed to ensure participants' privacy.

The final combined data set consisted of 158 writings. Of these, 29 responses came from university students, while 129 were written by primary school students (assumed to be 15 years old) and high school students (assumed to be 16–18 years old). Regarding the distribution across frame stories, 78 participants wrote about a positive encounter and 80 about a negative one. Most of the younger participants (primary/high school students) were aged 15–17 (90%). Among university students, the majority (86%) fell within the 18–24 age bracket, and a smaller group (14%) were aged 25–29, with no participants aged 30 or above. Overall, across both groups, 73.5% of participants were aged 15–17, 24% were aged 18–24, and only 2.5% were aged 25–29.

In analyzing the data, we chose not to disaggregate the writings by age group. The limited number of responses from university students aged 25–29 made meaningful comparative analysis infeasible. Instead, we treated all writings as one cohesive data set, interpreting them as culturally constructed accounts that reflect young people's shared assumptions and reasoning about human-robot interaction.

We also did not collect information about participants' prior experiences with social robots. Given that such encounters are still rare in everyday life, it is reasonable to assume that few, if any, participants had direct experience interacting with a social robot. Importantly, within our chosen methodological framework, prior experience is not considered essential. The purpose of the study was not to document actual past interactions but to explore the commonsense reasoning and cultural expectations young people hold about what social interaction with a robot *could* be like.

The adequacy of MEBS data is often assessed by reaching a saturation point, where new responses start to reflect similar patterns and types of reasoning (Särkelä & Suoranta, 2020). While a typical MEBS study may require around 15–20 writings per frame story (Shu et al., 2022), our data set significantly exceeds these recommendations, with 78 writings responding to the positive frame story and 80 to the negative one. This substantial amount of material strengthens the reliability and depth of the findings.

3.2.3 *Ethics*

This study followed the guidelines of The Finnish National Board on Research Integrity (TENK; Keiski et al., 2023). No prior approval from the Ethics Committee of the Region was required. Participation was voluntary, and although many participants were underage, all were at least 15 years old and thus legally able to consent under Finnish law. The study did not collect personal experiences, and responses were anonymous. Participants were exposed only at the textual level to scenarios potentially involving negative emotions, which is unlikely to cause harm, as the topic is neither sensitive nor triggering (cf. Shu et al., 2022).

3.2.4 *Data analysis procedure*

The analysis was guided by the research questions, aiming to explore the types of interaction described, the imagined practices with the robot, and the possibilities and limitations highlighted in the stories. The analysis did not aim to reconstruct the organization of interaction itself, but to identify recurring patterns in how participants describe and evaluate interactional success and failure in imagined scenarios. Initially, the data were categorized using a latent thematic analysis approach, which emphasizes interpretative work in theme development (Braun & Clarke, 2006). The first four authors collaboratively made preliminary observations, agreed on practical steps, and established shared guidelines for analysis. Subsequently, each author familiarized themselves with the data, identified key elements, and proposed candidate themes independently. This inductive, data-driven process avoided fitting data into pre-existing frameworks (cf. Braun & Clarke, 2006).

Themes were then compared and cross-checked for differences, revealing largely similar observations. The first two authors collaboratively refined the thematic structure into a cohesive, reportable format. Within this qualitative framework, the analysis emphasized richness, coherence, and interpretive depth over numerical frequency (Braun & Clarke, 2006, 2021). The trustworthiness was ensured through transparency, reflexivity, and rigor in coding and interpretation (Nowell et al., 2017).

4. Findings

Both positive and negative writings depicted interactions with the robot to be first encounters and consisting of spoken dialogue. In the context of the youth center, which was embedded in our frame story, the robot was primarily thought of as a youth worker who is supposed to support young people socially and emotionally. Alternatively, the robot was envisioned to assist with homework or provide information of various kinds. The positive stories generally depicted robots as interactionally skilled and as "*friendly and well-mannered.*" Moreover, the robots were depicted to demonstrate an awareness of human social norms. In contrast, negative stories tend to portray the robot as malfunctioning, exhibiting limited interactional abilities, or failing to grasp the nuances of the social situation.

Both positive and negative stories explore the symmetry between Sandy and the robot in terms of their interactional abilities. In human interactions, shared assumptions about what others know and can do form the basis for relatively symmetrical interaction skills. Social robots are designed to function within the framework of interaction but may not meet the expectations for such interactions in real encounters (Haring et al., 2018). The stories analyzed in this study focus on the effort to achieve this symmetry in interactions with robots.

In the following sections, we examine the key patterns that participants described as positive and negative within the data. Altogether three positive and four negative themes were constructed, each depicting a unique social-interactional aspect or pattern observed in the stories. While we do not report numerical frequencies for the themes, each theme was grounded in multiple stories across the dataset, reflecting recurring patterns of reasoning rather than isolated instances. To illustrate our analysis, we included direct excerpts from the participants' writings that exemplify the themes and highlight how meanings were constructed.

4.1 Positive themes

Three themes were constructed from the positive stories, which we have termed *Completion, Human-likeness*, and *Objectivity*. Across these themes, the interaction between Sandy and the robot is consistently described as proceeding and concluding successfully, adhering to established human interaction practices. Specifically, the interactions are managed on a turn-by-turn basis, with each turn being relevant to and building upon the previous one (cf. Sacks et al., 1974).

4.1.1 *Completion*

The stories in this theme focus on the successful completion of simple interactional sequences, such as question-answer pairs, with the robot. A common idea is the notion that interacting with the robot feels surprisingly effortless. Positive experiences often stem from the robot exceeding prior expectations of its capabilities. For example, one story describes how "*Sandy is confused at how well and clearly the robot was able to respond to the questions they asked.*" In some cases, a robot takes extra time to process information to formulate responses, making the interaction *"a little twitchy."* In response, Sandy adapts by *"adjust[ing] their interaction style to compensate for the robot's response time."* Although the interaction is described as "*not quite as fluid as with humans,*" the overall experience is framed positively because the interaction completes.

Several examples within these types of stories reveal that uncertainty and insecurity can be a relevant part of the interaction experience. In these stories, Sandy appears to question the robot's mental capabilities, wondering, "*It can't understand. Can it?"* This uncertainty leads Sandy to doubt how they should communicate or behave. Confusion is further reflected in Sandy's expressions, such as "*w-what?"* Ultimately, however, Sandy experiences a sense of relief upon realizing that the interaction *can* be managed in a manner similar to human interactions. This can be interpreted as Sandy's doubts being a natural part of the learning process, as they come to realize the need to adjust their expectations and explore what is possible with this new interactional partner. The key idea is that as actions typically assumed to be possible only with humans are now demonstrated by an embodied machine, it forces Sandy to reevaluate and make sense of the robot's capabilities.

In here, the positive experience stems simply from the novelty of the interaction and the robot surpassing expectations. The interaction typically ends without further interest in the robot, e.g., *"Sandy decides to end the conversation and go hang out among other teens,*" and the interaction being *"slightly unnatural compared to human interaction*" can be used as a justification for ending the conversation.

4.1.2 *Human-likeness*

These stories, which we term descriptions of the *human-likeness* of interaction, depict the robot as functioning in a way that does not seem pre-programmed to the story character Sandy. Instead, Sandy perceives the robot as "*thinking for itself,*" with the robot expressing itself in ways that make it appear like more than a machine: *"It was as if a human had advised them, not merely producing word-to-word copies from Wikipedia.*" The robot also generates responses that appear

indexical to the ongoing situation — a fundamental principle of human interaction (Garfinkel, 1967). For instance, *"The robot can ask appropriate questions regarding the situation and respond to Sandy in a way that they feel the robot is more than a mere mechanical response machine."* In such cases, speaking with the robot *"feels like talking to a person."* It is noteworthy that the descriptions of human-likeness frequently use phrasing such as "as if" or "feels like." These stories do not assert knowledge or belief about the robot's mental capacities for the character; instead, they emphasize how the interaction *appears* to them.

From an interactional perspective, unlike the previous theme which focused on completion of interaction, the key idea in these stories focus on the perceived or assumed originality of the robot's external behavior and how it contributes to a sense of the interaction being something more than a mere exchange of turns. In several stories within the theme, the conversation leads to meaningful outcomes and the robot acts as a confidant or a friend. For example, it becomes possible to share worries with the robot because it "*listens and understands them as a person would*"; or if Sandy lacks relationships, they can feel "*as if they had finally acquired a friend*" or "*as if the robot truly cares about them.*" The human-likeness of the robot is described in the stories as going beyond mere superficial replication of human traits. It is suggested that a similar kind of shared understanding that is foundational to human interaction, is also attainable with the robot.

Additionally, several stories highlight the robot's empathetic expressions, which contribute to the perception of it as more than a mechanical device. These empathetic behaviors are not isolated but indexical, emerging from and tied to the immediate context of the described interaction. The robot's ability to address Sandy's emotional state shows an understanding of the situational cues that inform its responses. This use of context-sensitive, indexical expressions reinforces its role as a companion capable of creating meaningful connections, further enhancing the sense of human-likeness and depth in the interaction. The surprising element in these stories was that the robot was in the first place capable of ordinary interaction with a human.

4.1.3 *Objectivity*

In these stories, as in previous themes, the interaction with the robot unfolds according to the practices of human interaction. However, the focus here is not on the success of the interaction or the human-likeness of the robot. Instead, the emphasis is on the robot's uniqueness and distinctiveness compared to humans, specifically due to its nature as a machine.

In these stories, the robot's abilities are not questioned or doubted, nor is there uncertainty about how the interaction will unfold. The interaction progresses smoothly, with the robot being trusted for what it is, a robot, rather than

as if it were human. The robot's perceived neutrality and objectivity emerge as its inherent quality, and this allows for the person to convey their worries to it without fear of judgement: "*[the robot] doesn't experience things like a person, it would be easier to talk to it.*" In the stories, talking to the robot seems like a good idea because it *"does not experience things as people […] nor think of Sandy in a particular way"* and this is what Sandy needs. The robot can be more approachable than a human: *"A robot is suitable for a person who fears such situations."* Thus, the lack of genuine human experiences is framed as a positive attribute, making the robot a suitable interaction partner because it is perceived as objective and neutral.

4.2 Negative themes

From the negative stories, we constructed four themes termed *Unresponsiveness, Directness, Unfamiliarity*, and *Superficiality*.

4.2.1 *Unresponsiveness*

This theme emphasizes the idea that interaction with the robot is incomplete, contrasting with the positive Completion theme. In here, despite Sandy's efforts, the interaction fails to progress due to poor programming or sudden malfunctions: *"Sandy went to the robot and talked to it for a while, but the robot just stayed silent."* The robot may have stopped working unexpectedly, failed to respond, or run out of charge. The robot is unable to process spoken language or understand, which renders it interactively incompatible, leaving the person unable to accomplish anything with it. In these scenarios, the blame is placed on the robot rather than on the individual, as the failure is attributed to the robot's shortcomings.

However, the stories go beyond merely highlighting the incompletion of the interaction, introducing an additional experiential dimension tied to the robot's unresponsiveness. They emphasize the unsettling and problematic aspects of the robot's stillness and inaction. For example, *"The robot didn't move at all. Its eyes stared motionlessly"; "Sandy walks towards their friend, but the robot still stares."* Moreover, the robot's embodiment is frequently described as eerie, with unsettling features such as its unchanging gaze: *"The gazes were strange"; "The robot was silent and just stared straight into Sandy's eyes. 'It feels like it's looking straight into my soul.'"* These descriptions convey a sense of unease and uncanniness stemming from the robot's unresponsiveness. As was observed within positive themes, these examples reflect the way in which robot's behaviors become indexed into the scene and interpretable through it. This theme highlights how *inaction* can be seen to contribute to the overall experience of the situation, because both the robot's actions and inactions become indexed within an ongoing interaction scene, and thus, can become meaningful.

4.2.2 *Directness*

In this theme, the negative experience arises from the robot's overly direct speech and its excessively logical or calculative demeanor. The robot's behavior lacks sensitivity, violates social norms, and is perceived as inappropriate. The stories specifically emphasize that the robot is "too honest" and "direct," unable to adjust its dialogue to adhere to the rules of respectful and empathetic interaction: *"The robot [...] hurt Sandy deeply with every sentence. The robot didn't seem to notice, though, and didn't react even when Sandy was tearing up."* This *Directness* can be contrasted with the Objectivity theme observed in the positive stories: they represent two sides of the same issue. In the positive stories, neutrality is perceived as a positive trait. Here, however, the same neutrality — described by participants as a lack of sensitivity and adherence to normative rules — becomes a distinctly negative feature. The problem in the stories seems to be that the robot does not have the ability to do "facework," that is, to maintain morally proper "faces" of each interaction participant, which is usually normative in human interaction. Directness can threaten one's face and make one feel bad or hurt (cf. Goffman, 1955).

The stories, therefore, bring up that it is important not only *what* the robot says, but *how* a robot says things, and how those statements are tied to the ongoing situation. People orient to human interaction always with normative and moral stance (Heritage, 1984, p. 75–102). They have learned to interpret the subtle indexical elements of interaction while learning language and bodily expressions, socializing into their community and growing into adults (Enfield & Levinson, 2006). As a result, when someone engages in interaction based on familiar normative expectations, a robot's response can still feel offensive, even if the person consciously knows the robot is just a machine without consciousness. This emotional response stems from the violation of social norms in the interaction. For instance, if you speak to a robot with good intentions or seek advice, and the robot responds too bluntly, it may hurt your feelings.

4.2.3 *Unfamiliarity*

In few stories, Sandy is portrayed as suspicious of the robot due to a lack of understanding about its capabilities. These stories focus on Sandy's inner thoughts rather than the actual interaction, highlighting the mystery of the robot's abilities and programming. Sandy wonders what the robot can do and how intelligent it is, leading to feelings of uncertainty, distrust, and even paranoia, as there is not enough clarity about its functions. The robot is perceived as fundamentally different from humans, making it seem untrustworthy and suspicious. In one story, the robot's access to Sandy's social media without consent is seen as a violation, intensifying the sense of threat. *"'Hi Sandy!' the robot greets. 'How do you know*

my name is Sandy?' they ask. 'I found your name online using your face', the robot replies. Sandy wonders, what else could it find about me online? […] 'How's Amy doing?' the robot asks next. 'How did you know I was with Amy?' Sandy asks. 'I saw her Instagram post […]'".

This issue arises due to the lack of transparency around the robot's abilities. In positive stories, the same idea of unfamiliarity is expressed partly in the theme Completion but there the stories end with the person feeling relieved that the interaction was able to proceed and the uncertainties were somehow removed during that encounter. In other words, when uncertainty is unresolved, like in stories here, the person is left with discomfort and concern; in these stories the robot is not the trusted member of a social practice.

4.2.4 *Superficiality*

In this theme, the interaction proceeds without errors, and the robot provides an answer to Sandy's questions, managing to fulfil the requirements featured in the theme Completion described earlier in the positive stories. However, the stories view the robot as mere machine and deny that it could have any value beyond a simple exchange of words.

Thus, here again, the robot seems not to be a trusted member of social practice. The practice to which the robot is associated in these stories is specifically youth work in a youth center. The robot is assumed to take on the role of a confidant or some kind of support figure comparable to a youth worker. An idea underpinning these stories is that an interaction partner in this kind of position must be able to have genuine feelings of their own that they can reciprocate with: *"The robot cannot feel. It does not know anything about working with youth"; "A youth worker would be better"; "The robot lacks expression, and it does not help Sandy the way that a youth worker would."* Sandy is left feeling empty, disappointed, and frustrated because interacting with the robot feels unreal and lacks a genuine understanding of their condition. And due to the lack of a true listener, the interaction has no value: *"Sandy feels there is no point in interacting with the robot, because the robot cannot understand them"; "It is as if the conversation had never happened."* The robot's lack of real emotions and real "personhood" makes its interactional output and the resulting interaction feel fake: *"Sandy feels as if the robot does not genuinely listen to them, and is not truly interested in what Sandy says"; "The robot does not really care"; "Its attempt at showing empathy felt ungenuine."*

Here the robot's embodiment, the "robot-likeness" is used as an account against its character as a real interaction partner. *"The robot responds in a robot-like manner."* This is in contrast to the positive stories where a robot-like appearance and expression was accepted as long as the outcome was positive and lead

to for example the feeling of being heard. Also, in the quotes "*They are following algorithms and doing calculations"; "It is mere bolts and screws*" robot's "machineness" is used as an account against its interaction capability.

Some stories that are placed in the theme Superficiality focus on a more micro-interaction level and concern how the interaction unfolds and builds on previously discussed things (e.g. Schegloff, 2007). Robot's contribution to the conversation is described not based on an understanding of what has happened and what is going on, rather, it is a series of question-answer pairs, that are based on previous programming and thus limited. The key issue is thus that the robot has been preprogrammed, it lacks the ability to use indexical resources, and cannot produce real interaction that requires situational awareness, spontaneity and responsiveness: *"it does not have a brain and it only spits out questions that have been programmed to it."* Furthermore, this repetition of pre-existing lines results in the feeling that the interaction is not worth having: *"Seemed fake, like repeating lines from memory. Sandy could not get anything out of the conversation. As if interacting with no one."* It is important to note that these descriptions reflect understandings of robot behavior that were prevalent before the emergence of LLM-based interactional systems; at the time, many participants tended to imagine robots as rigid, preprogrammed devices rather than as potentially adaptive or generative conversational agents.

5. Discussion

This section discusses the research questions by revisiting and synthesizing the study's findings. Sections 5.1 and 5.2 summarize the results, focusing on how the actions with the social robot were described in ways that could be characterized as social, and on the other hand, the ways in which interaction was depicted as unsuccessful in the writings. Section 5.3 then considers the broader implications of these findings, situating them within the context of commonsense cultural expectations. Finally, Section 5.4 discusses the study's limitations, reflecting critically on the scope of the analysis and suggesting directions for future research.

5.1 Passing as social

On many occasions, the stories describe the robot to be interactionally interchangeable to a person. However, this does not mean that the robot is actually believed to be a person as such in the stories. In fact, the stories emphasize merely that Sandy feels "as if it were a person," or that the interaction proceeds in a way that the robot passes some kind of *threshold of sociality*. To unpack this idea,

it is worth noting that for human interaction to proceed, people do not need to have actual correct beliefs about other people's mental states. Rather, human interaction is based on what is evidently in the common ground (Garfinkel, 1963; Tomasello et al., 2005) and interpretable by the participants in a similar manner. It could be said that in human interaction, we continuously pass this threshold of sociality by simply following the rules of interaction, by acting consistently in ways of the competent member of a social practice.

In principle, in the MEBS stories, according to the frame story, it would be practically possible to imagine the robot having unlimited capabilities, but in fact, the stories revolve around the fact that people have to resolve this problem of managing their understanding and practical expectations of the possibilities within the situation. Passing as social, the appearances that robots can produce with their bodies become readable as intentional actions (Jarske et al., 2020; Jarske, Raudaskoski, et al., 2025).

In the positive stories, the robot is described doing exactly this. In the theme Completion, some stories point out that the robot has a slow response time, but the interaction proceeds despite this. Robot's success is not based on merely replicating human interaction in *style*, rather, it is based on a binary attribute: the robot's expressions, although sometimes delayed (and which could make the interaction feel somewhat difficult according to the stories) are still enough to keep the interaction from falling to the domain of superficial interactions found in the negative stories, and thus, passing as social. It is important to note that here, *passing* does not refer to passing as a particular social category (such as passing as a woman), as discussed in Garfinkel's analysis of transgender Agnes (Garfinkel, 1967; see also Rawls, 2023). Rather, we use *passing* to describe whether robot's conduct becomes readable as participation in social interaction at all. In this sense, passing concerns the interactional threshold between social and non-social conduct, not categorical identity. We can use Garfinkel's (1963) example of playing games here: you can play poorly, but you still follow the rules of the game. This means that the style of play is separated from the constitutive practices of the game, which have to be followed in order for the game to exist as a practice in the first place. Thus, the robot may have a different style when it participates in interaction (Completion theme), it can offer a sense of being a real living thing (Human-likeness theme), or it may offer alternative possibilities by having the qualities of a machine (Objectivity theme), but it plays the human interaction game correctly in all of them. Thus, the robot may act slowly or awkwardly, yet as long as interactional expectations such as turn-taking and responsiveness are met, the social game remains intact.

5.2 Failed interaction

In the positive stories, the end point of interaction is reached, including a rational understanding of the action (e.g. in Completion). In the negative stories, the robot violates the expectations of the interaction, its body does not participate as expected, and the interaction does not move forward. In the Unresponsiveness theme the stories focus on problematic interaction situations with the robot. Due to poor programming or sudden malfunctions in the robot, the interaction cannot proceed, and thus, the robot does not pass as social interactant. Here, people are expecting interactional skills from the robot, but they disappoint. Thus, it is the robot's fault that the interaction is failing.

The theme Directness contains the same features of interaction as the positive theme Objectivity, but here these features are seen as interactionally "rude." This illustrates the difficulty of designing interactive social robots. Although current large language models applying artificial intelligence can calculate various linguistic "tones" of the next turn that would add "softeners" to the conversation, such planning can be more difficult with an embodied robot. If the verbal feedback is not softened by bodily "gestures," or there is a contradiction between the linguistic and bodily expression — for example the gaze of a robot is not in synchrony with what it is doing/to whom it is talking (cf. Jarske, Raudaskoski, et al., 2025) — it can produce problematic experiences for the person interacting with the robot.

In the theme Unfamiliarity, the stories told about the uncertainty of the robot's capabilities. These negative-ending stories contain feelings of distrust, and Sandy does not receive enough understanding about the robot's interactional skills. However, the theme of Unfamiliarity can be seen to manifest itself both in the positive and negative stories. The doubt that is directed at the robot is presented as part of learning in the positive (Completion), and in the negative it is brought more to the core of the experience.

In the theme of Superficiality, the robot is not considered socially competent and is "just" a robot. Genuine interaction requires social competence. Here the difference between positive and negative is how the robot performs. Thus, the robot is portrayed as failing to become a trusted member in the social practice of youth work at a youth center, where it is expected to assume the role of a confidant or supportive figure akin to a youth worker.

5.3 Interactional intelligibility and the threshold of sociality

As the previous sections showed, participants described both successful and failed interactions in terms of the robot's ability to align with human social norms. Building on this, we argue that the stories reflect a shared interpretive frame-

work: a threshold of sociality that defines when a robot's behavior is recognized as socially intelligible and sufficient for participation in human practices. Our analysis demonstrates that young people draw on commonsense cultural expectations to evaluate robot behavior. These expectations shape whether the robot is seen as a competent social actor, not based on internal capacities but on its ability to produce recognizable, contextually appropriate actions within familiar interactional practices (Garfinkel, 1967; Kahn et al., 2008).

The notion of a threshold of sociality developed in this study resonates with discussions of the uncanny valley effect, which have traditionally focused on discomfort arising from mismatches between a robot's physical appearance and its behavior (Mori, 1970; MacDorman & Ishiguro, 2006). However, our findings suggest that perceived uncanniness is not solely a function of appearance–behavior mismatch but can also arise when a robot fails to meet interactional norms, such as appropriate timing, or the locally relevant norms associated with its assumed social role, such as that of a supportive youth worker. In these cases, the robot's conduct becomes socially unintelligible within the youth center context.

Rather than reaffirming general HRI principles, the study shows that interactional intelligibility is a context-dependent achievement: a robot positioned in a youth center is evaluated against norms of care, peer presence, and supportive institutional roles, which differ markedly from expectations applied to robots in, for instance, domestic or retail settings. This reinforces the view that intelligibility emerges from situated social interpretation rather than from universally "social" behaviors (Suchman, 2007; Kahn et al., 2008).

Interestingly, participants' "surprise" often stemmed not from extraordinary feats but from the robot's ability to sustain mundane, ordinary-seeming interaction. This suggests that achieving unremarkable, everyday interaction remains a significant benchmark for positive affect, highlighting how "passing as social" is still perceived as an exceptional outcome. Importantly, the same features, such as directness, timing, or gaze, were interpreted positively or negatively depending on the situational context. This underscores that the meaning of robot behavior is not embedded in its design but emerges through social interpretation in light of participants' expectations and the imagined scenario. Even when human-like social cues are present (Ghazali et al., 2018), their reception depends on how they are enacted and perceived in context.

These findings challenge the assumption that human-likeness is inherently desirable in HRI. Human-like behavior was valued only insofar as it supported socially accountable and appropriate action. This points to a shift from designing for anthropomorphism towards designing for interactional intelligibility, where robot behavior makes sense within human expectations and social order (Suchman, 2007).

5.4 Limitations

This study has several limitations that also suggest avenues for future research. First, the data are based on imagined scenarios, which reflect normative and culturally shared expectations rather than lived experiences of human-robot interaction. However, while this approach does not capture authentic interaction dynamics, it allowed participants to articulate assumptions and social reasoning, including forms that may not surface in real encounters. From a methodological perspective, future pilot testing could benefit from block randomization to avoid imbalances between positive and negative prompts.

Second, we did not collect information on participants' prior experiences with robots. Given how rare such interactions are in everyday life, it is likely that only a few participants had direct encounters. Within our methodological framework, prior experience was not essential, as the aim was to explore culturally shaped understandings of what robot interaction could be like. However, such experience could potentially influence how participants imagine and evaluate robot interaction. Participants with prior knowledge of robots' technical or interactional limitations might adjust their expectations accordingly, which could shape the content of their narratives. Future research could explicitly account for prior experience to further examine how familiarity with robots affects imagined interaction and expectations.

Third, although participants ranged from 15 to 29 years, the small number of older respondents made age-based comparisons infeasible. The writings were thus analyzed as a single corpus, focusing on shared cultural narratives among young people.

Finally, since the findings are situated in a specific cultural and linguistic context, their transferability may be limited. Future studies could extend this approach across diverse settings and real-world interactions. Despite these constraints, the study provides valuable insights into how youth imagine social robots and the interactional norms shaping these perceptions.

6. Conclusion

This study, utilizing the Method of Empathy-Based Stories (MEBS) as a qualitative narrative approach, provides valuable insights into the social dynamics of human-robot interaction (HRI), particularly as experienced by young people. Through the analysis of imagined stories generated via MEBS, the research highlights the culturally shared and commonly understandable elements that young people draw upon to construct their descriptions of human–robot interaction,

simultaneously revealing the expectations they hold about interacting with robots. These themes reveal how robots are judged based on their adherence to — or deviations from — human social norms. This approach highlights that people's experiences are not merely shaped by the robots' programmed capabilities but are deeply intertwined with shared cultural norms, social practices, and the situated purposes of the interactions. While our study is not a design study in a strict sense, it contributes to HRI design by revealing how normative assumptions and cultural templates shape imagined robot encounters. These insights can guide designers to attend not only to feature-level interaction cues, but also to the broader interpretive and normative frameworks through which those cues are understood (e.g., Pelikan et al., 2020). As such, the study supports calls for HRI research to focus on context-sensitive, socially grounded understandings of interaction (cf. Bartneck et al., 2024; Jarske, 2025).

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