Children As Evaluators: Understanding Emotion Language Acquisition

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This paper introduces a novel approach in the Child-Computer Interaction (CCI) field that examines how children's feedback on experimental stimuli can enhance research design, using emotion research as a case study. Our study utilizes interactive vignettes where children act as 'emotion detectives', providing insights into their emotional articulation, followed by elicited feedback on the stimuli and research process. This method refines emotional vocabulary elicitation techniques and empowers children by incorporating their perspectives into the experimental design. The core of this research lies in establishing a participatory framework for involving children as evaluators, thereby proposing changes within the realm of experimental methodologies. We hope that this could serve as a tool to researchers studying children using an experimental setup.

CCS Concepts: • **Human-centered computing** → **Empirical studies in collaborative and social computing**; • **Social and professional topics** → **Children**.

Additional Key Words and Phrases: Stimuli development, children as evaluators

1 INTRODUCTION

The act of expressing emotions through language is a critical developmental skill, yet the exploration of how children acquire and use emotional language remains understudied [18]. Our project aims to investigate the linguistic processes through which children articulate emotions, examining both self-expression and recognition of emotions in others, as well as the influence of parent-child interactions on this development. This inquiry enriches our understanding of how children learn to talk about emotions, and has the broader objective of nurturing the emotional well-being of children.

The IDC community has strongly advocated for children being actively and effectively included in research. Building from early work on co-design [7], and on children as usability evaluators [13] there has been an enthusiasm to explore and develop new methods and approaches that include children as designers [29, 30], evaluators [3] and research participants [23]. We want to use this present study to develop high-engagement stimuli in order to collect rich conversational data from children involving their emotions and lived experiences, believing this to be a valid and important area for research with children, as called for by Antle and Hourcade [1]. Additionally, we want to bring in a participatory approach by involving children as evaluators of experimental stimuli. We want our child participants to feel valued [24], and to enjoy the process of 'giving' useful data to the research team, as this promotes involvement and

active engagement which should help us obtain high-quality data. The study described here should be able to serve as a tool to researchers working with children using a variety of experimental paradigms.
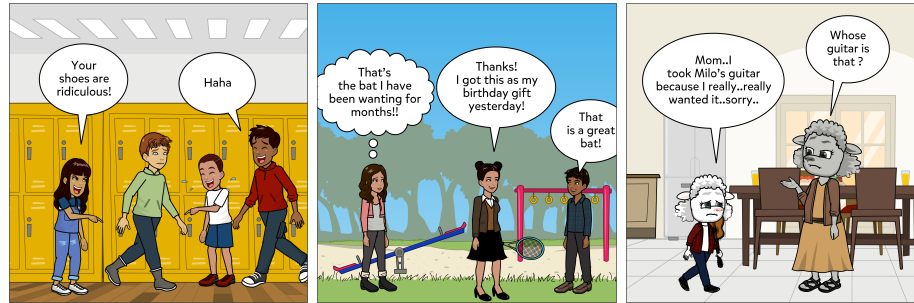

Fig. 1. Stimuli for embarrassed, jealous, guilty.

2 RELATED WORKS

2.1 Emotion Language

Emotion socialization refers to the process by which caregivers foster and influence children's emotion understanding, expression, and regulation [8]; this involves conversations about emotion, including discussions of emotional experiences and responses to child emotion expression. Children who cannot express their emotions successfully are at a higher risk of suffering psychopathologies [6].

Recent works have provided insights into the relationship between language and emotion [18]. Fischer et al. [10] show how different components of emotions are developed hierarchichaly over different age groups. The understanding of children's emotions progresses from a broad categories to more distinct categorical labels such as happiness, anger, and sadness [26, 31]. Language plays a crucial role in the development of emotion understanding [20, 22].

While we know emotion expression is healthy, emotions are a hard topic to talk about. The discomfort about being able to talk about emotions could stem from multiple reasons such as fear of conflict, judgment or being unsure of how the other person would respond. Culture plays a big part in how emotion is socialized in the environment as well [2]. This affects how children view emotional expression. For children, it's easy for everything to become a source of shame if nothing is normalized [5], including talking about their emotions, even though research has shown that talking about feelings and emotion expression can help manage emotions [4, 21].

Language plays an important role in being able to express what one is feeling. Lindquist [18] showed that momentary access to emotion words impacts one's perceptions about emotions and Torre and Lieberman [27] show how affect labeling (associated with emotion vocabulary) helps emotion regulation. The ability to be able to specifically describe one's emotion using words predicts a range of physical and mental health outcomes [16]. Work looking at the usage of emotion vocabulary by children from different age groups showed that as children grow older they use more different emotion words [12]. However, even at the age of 11 they fail to show an adult-like usage of emotion words. This shows how the question of how children learn to map emotion labels to behaviors in the world is still not fully answered [18].

Experimental research can help show how children learn to understand and verbalize emotions, but this requires operationalizing emotion learning in a child-friendly way. In the current paper, we show how taking a participatory approach involving children as co-designers and co-evaluators sheds new light on their knowledge about the world.

2.2 Children as Active and Informed Participants in Research

Taking inspiration from early work in social science on giving children voices [14], the IDC community is constantly looking at ways to better include children in research, design and evaluation studies. Underpinning this effort is a strong belief that children should participate voluntarily [28], their participation should bring them value [24] and that methods that they use, especially in research studies, should be tailored to their needs [19, 23]. In studies that are looking at children's language, it is well understood that the methods used will have an impact on the data that is gathered. In HCI there have been studies that have looked at how children interact with agents [33], and on how children might chat with one another when facilitated by an interface [17]. In both instances it is clear that the technology and method used has an impact on the data that is collected. There is a balance to be had in terms of. As Paul Connelly (cited in James et al. [15]) states, the challenge of choosing the correct methods to seek the voices of children, while also engaging with the underlying and pre-existing values and assumptions researchers have about children and the influence they may exert within the research process.

3 METHODOLOGY

We collect data from children similar to Grosse et al. [12]: we ask children to talk about characters in a vignette, highlighting semantic organization and development of emotion concepts [25]. Our focus is on gathering the linguistic data rather than actively supporting children to regulate or talk about their emotions from an expressive position (see Erdemir et al. [9] and Gagan et al. [11] for papers that take other approaches to emotion in the IDC domain).

Our preliminary study was conducted at two sites - at a table in the MOXI Children's Museum in California, US and in one-on-one interviews in Lancashire UK. We created vignettes on Pixton.com to depict scenarios that typically evoke emotions like embarrassment, jealousy, and guilt in familiar, common settings. We asked the children to become "emotion detectives" and describe the scenarios in the vignette. We then followed up with questions about the characters in the vignette and their emotions. The study aimed to observe how children aged 5-13 interpret these emotional scenarios, their ability to articulate the emotions displayed, and how they relate these vignettes to their personal experiences. We had the following exploratory objectives which we wanted to test :

- Objective 1: Articulating emotions may be challenging for children, particularly in a research setting where they are asked to reflect on their experiences and emotions explicitly.
- Objective 2: Feedback from children on the research process might be complex or not implementable.
- Objective 3: Children might prefer designing the character of themselves to be added to the vignette, which in turn can increase their engagement.

3.1 Study design

We ran a small-scale study to understand what kind of feedback children provide. Using Pixton.com, a comic creating website, three vignettes were designed using several experiences in children's lives as the experiment stimuli. Figure 1 shows the stimuli shown to children. There were vignettes for the emotions embarrassed, jealous and guilty. We designed characters in different environments such as school, park and at home. All children were shown the three vignettes in the same order. After each picture, the children were asked questions about their personal experiences related to these emotions. For example: "Have you ever felt jealous?", "What do you do when you feel sad?", "What would you say to your friend who is feeling jealous?" , " Do you tell your parents how you are feeling?". These questions were then followed by feedback questions about the stimuli itself. The questions included "Did you enjoy the game?"

and "What do you think can make this game better?". Finally, we asked if they would like to design themselves as a character to be placed into the scene. The questions and the instructions for the researcher can be found in this survey.

4 RESEARCH SITES

MOXI Museum, USA: Sessions were held at MOXI children's museum, as part of the "Science in Action" program. Parents of children ages 5-13 were approached to explain the study and to ask if they would be interested in asking their child to participate. The script used for the parents and the children can be found here. The child was then asked by the parent if they were interested in participating in the study. The child was then explained that they were about to play a game where pictures will be shown on the laptop, and that the characters will be in a scene and their task is to describe the picture and their role as an emotion detective is to identify the emotions the characters might be feeling.

Lancashire, UK: Here, the experimenter recruited child participants from the local community one at a time. The experimenter used the same script as described in the previous section.

4.0.1 Data. **MOXI Museum, USA** : Six chilidren were tested: ages 6 (n=3), 8(n=1), 9(n=1), 11(n=1). We recorded audio and video for two children and audio-only data for three children.. For one child, who was not comfortable with collecting audio or video data, we took notes. The audio data collected were then transcribed and analyzed for patterns. Audio files were manually transcribed.

Lancashire, UK: We had two participants of age 5(n=1),7(n=1). No audio or video data were recorded; feedback was recorded by taking notes.

5 RESULTS: OBSERVATIONS

MOXI Museum, USA The pilot study yielded significant learning insights, particularly in terms of methodological refinement and understanding children's emotional expressions:

- Need for Structured Protocols and Scripts Across Age Groups: The study highlighted the necessity of developing age-specific protocols to effectively engage children in discussions about emotions. Children of different ages have varying levels of cognitive and linguistic abilities, necessitating tailored approaches to elicit meaningful responses. For instance, in our study, the younger children needed the text in the speech bubbles to be read out, while the older 9 and 11 year olds were able to read the text on their own. Younger children may require more concrete and visually engaging prompts, while older children might engage more with scenarios that provoke emotions through pictures. We believe careful designing of conversation prompts and a clear research protocol would help bring back the content to the topic if the children ever started to talk about a topic in tangent.
- Generalization of Emotional Vocabulary: The study found that children often generalized their emotional experiences, predominantly identifying emotions as "sad" regardless of the scenario's intended emotion. This observation matches with prior developmental trends finding where children first learn to categorize emotions into broad groups before differentiating into more nuanced emotional states [32]. For emotions that might be labeled by adults as jealous, embarassed and guilty, the common answer we got from younger children were "sad". The 11 year old was able to provide more fine-grained labels such as "shame". This means that stimuli eliciting both broad and subtle shades of meaning may be particularly important to develop in order to look at growth over development. Importantly, with respect to **objective 1**, these initial conversations about their own emotions and their personal experiences clearly showed that the children are remarkably open to reflecting on their experiences and emotions: rich and nuanced data can be collected even from fairly young children.

- Child Feedback on Research Stimuli: Children's feedback on the vignettes provided critical insights into their preferences and engagement factors. Contrary to the expectation that children's feedback might be too complex or not implementable, their insights were profoundly grounded in their personal experiences and perceptions. Most feedback was practical and centered around making the scenarios more relatable and engaging. This demonstrates that children can provide realistic and constructive feedback when they are engaged and feel their input is valued.
  - Diverse environments: They expressed a desire for more diverse settings beyond school environments. One of the six year olds mentioned that he would want to see more of these scenarios which are not based in school, but rather outdoors with more trees.
  - Need for more positive emotions: Two of the six children mentioned that they would like to see more happy scenes. While from a research perspective, the negative emotions are critical to answer many research questions, positive emotion based vignettes will likely help boost engagement in children and make the study more fun. In future work, we will likely implement both positive and negative scenes.
  - Preference for realistic scenarios and family dynamics: Children expressed a strong desire for vignettes that mirror their everyday experiences, particularly within family settings. For example, a nine-year-old shared personal anecdotes of conflicts with siblings, suggesting the inclusion of sibling dynamics in the vignettes to evoke genuine emotional responses. Similarly, a six-year-old discussed feelings of jealousy in the context of sibling interactions. These responses underscore the importance of crafting stimuli that reflect the diverse family structures and domestic situations children navigate. Such relatability can elicit more authentic and insightful responses, providing deeper understanding into their emotional world. The feedback from children suggests that personalization of the research stimuli could enhance engagement and relevance. Asking children about their family setup before presenting the vignettes could allow for the customization of stories to better resonate with their personal experiences. This approach not only validates the children's lived experiences but also promotes a more nuanced exploration of their emotional responses in familiar contexts.
  - Preference for motion and sound: Several children showed a preference for dynamic and interactive elements, such as moving images and sounds, over static speech bubbles. This preference suggests that incorporating multimedia and interactive components could significantly increase engagement and the effectiveness of the stimuli in eliciting emotional responses. These changes would also allow stimuli to be more suitable for a wider array of ages and language abilities.
- Impact of Personalization in Engagement: Contrary to our expectation for **objective 3**, when asked about the option for children to design their own character to insert into the vignette, the majority of the answers were "no". This finding suggests that while personalization is important, it must be carefully designed to align with the children's interests and the study's objectives.
- Role of Teachers: Many of the younger children mentioned having conversations about their feelings with their teachers. For next steps, asking the teachers' feedback on the scenarios might help provide more realistic school situations which can be used to elicit emotion conversations.
- Timing and Environmental Considerations: The timing of sessions at the museum influenced participant turnout and engagement levels. This aspect underlines the importance of considering environmental factors in planning child-centered research.
- Location: The environment in which research is conducted can significantly influence its outcomes. Since children come to the museum with a goal of being engaged, we believe that had a role in how much the children were open

to participating. Thus crafting a setting that is perceived as enjoyable and engaging by children may enhance their participation and the quality of the feedback they provide.

Lancashire, UK The feedback from the two children showed similar patterns to some of the behaviors at the MOXI museum. Both the children were able to explain the scenarios in the vignette. However, with the five year old, the study was quite difficult to run since a lot of scaffolding was required. This participant is known to have an excellent reading ability for their age and is a high achiever academically and in sports. This suggests that for children who are not comfortable talking about emotions, we could design alternate form of questioning such as agreement statement questions. The seven year old was able to connect to the emotions shown and shared similar personal experiences to the children tested at the MOXI museum. Both the participants had mixed responses when asked if they enjoyed the game, based on the vignette shown. Interestingly, and contrary to the US data, both the children were interested in designing characters to represent themselves in the vignette.

Across both sites, next steps will involve a detailed analysis of the data, aiming to categorize the feedback received into distinct themes. This categorization will help in structuring the feedback into a coherent framework. We anticipate this to be an iterative process, where the insights gained from each analysis cycle inform the subsequent refinement and development of the framework, ensuring it effectively captures the nuances of participant engagement and feedback. Another crucial component which we plan to focus on is to identify how cultural factors play a role in these conversations. By collecting more audio data from both sites, we hope to analyze patterns found to contribute to the literature on comparing cross-cultural experimental studies involving children.

In our future work, we would also like to introduce the changes suggested by the participants of this study as an intervention effect to see how it changes the kind of information we get from children.

6 CONCLUSION

The insights from this preliminary study underscore the critical importance of integrating child-centric feedback into research methodologies, demonstrating that such engagement leads to more genuine and effective outcomes. Our findings align with the IDC conference's overarching aim of nurturing inclusive happiness, highlighting how children's active participation not only enriches the research process but also advances our understanding of their emotional well-being. This study marks a first step towards establishing a framework for involving children as active evaluators in research, ensuring that their perspectives are integral to and valued within the investigative process. Moving forward, we plan to refine our approach by incorporating the feedback received and conducting comparative analysis with the findings of Grosse et al. [12]. Our future work will build on the current study, focusing on developing a co-evaluative framework that empowers researchers to create engaging and relevant stimuli, ultimately enhancing the quality and impact of data collected from child participants. This initiative is a step toward a more participatory paradigm where children are not merely subjects of experimental study but are collaborators, contributing to a deeper and more nuanced understanding of their experiences and emotions.

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