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AI IN THE EARLY YEARS

Examining the implications of GenAI toys for young children



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EXECUTIVE SUMMARY

Why we did this research

The rapid rise of Generative Artificial Intelligence (GenAI) means we are now seeing GenAI designed and marketed for direct use by young children through toys. This report details research findings from our AI in the Early Years project, which aimed to provide a scientific basis for identifying the impacts, risks, and opportunities of GenAI toys designed for children aged five and under.

The early years are a unique developmental stage during which children develop key social and emotional skills, and we therefore approached this research with the understanding that impacts of GenAI in these areas could provide exciting developmental opportunities but also put children at risk during an important developmental period.

What to expect from this report

Evidence on young children's play with GenAI toys

Approaching these questions from a developmental perspective, we provide a unique view of young children's interactions with GenAI. Through three research studies, including a scoping review of the scientific literature, an examination of perspectives from the early years sector, and direct observations of young children playing with a GenAI toy, we provide initial evidence on the implications of GenAI for young children.

Research-informed recommendations

Focusing on how key groups can approach and manage the rise in GenAI toys for young children,

our research findings inform the **recommendations** presented in this report for **families, early years practitioners, toy developers, language model providers, and regulators and policymakers.**

Each of these groups must recognise the unique importance of early years as a distinct developmental stage and consider potentially disproportionate impacts on children from disadvantaged backgrounds:

- **Families** should play together, creating opportunities for age-appropriate discussions on how GenAI works, appropriate relationships with GenAI toys, and differences between GenAI and real people.
- **Early years practitioners** can apply their expertise to informing families of developmental considerations and ensuring intentional and appropriate use of GenAI for children in their settings.
- **Toy developers** must ensure that GenAI toys designed for young children are fostering social play with other humans, providing appropriate emotional responses, and engaging in pretend play.
- **Language model providers** should grant, monitor, and revoke access to their models, ensuring that third-party toy developers are integrating models in an age-appropriate manner.
- **Regulators and policymakers** should be aware of the key characteristics of early years development, including social and emotional learning and the prominence of play, regulating to ensure children's psychological safety.

Our findings and recommendations represent an initial step towards understanding the implications of GenAI toys for young children. Continued focus on this area across sectors is essential to ensure GenAI toys are developed and applied with children's best interests in mind.



INTRODUCTION

The advent of GenAI is transforming children's lives. However, considerations of GenAI's impacts largely focus on school-aged children and adults. Driven by knowledge that the early years are a key period for social and emotional development, we examine the possible impacts of GenAI for young children.

GenAI is being designed for young children and embedded into toys, and GenAI toys can hold human-like conversations with children or generate human-like play content. Based on the importance of play in young children's lives and the substantial time young children spend engaged in play, we focus on GenAI toys to examine how young children play with GenAI and what this might mean for their learning and development.

For this project, we partnered with [The Childhood Trust](#), a London-based child poverty charity. With their support, we focused our examination of GenAI toys on children from backgrounds of socio-economic disadvantage. This focus ensures that

the children who are often disproportionately affected by both the risks and opportunities of new technologies are centred in the research.

This report outlines findings from three studies, conducted in 2025 to 2026, which have not yet been peer reviewed (Goodacre et al., 2026b; Goodacre & Gibson, 2026a; Goodacre & Gibson, 2026b). We first present a scoping literature review to bring together the existing scientific evidence around GenAI toys for young children, then report a comprehensive analysis of perspectives from the early years sector to demonstrate where key opportunities and concerns lie, and finally share our examination of young children's views of and play with a GenAI toy.

Together, these three studies provide a thorough initial understanding of GenAI toys in the early years and a basis for future research, policy, and ethical design. We define some key terms, for the purposes of their use in this report, in Table 1.



Table 1. Key terms used in this report.

Early years

The period from birth up to and including age five years.

Generative artificial intelligence (GenAI)

A digital technology that, when given a prompt, creates human-like responses (Lim et al., 2023).

Toy

A tangible item intended for play.

REVIEWING THE EVIDENCE

Summary

To comprehensively understand the existing scientific evidence on GenAI toys designed for young children, we systematically reviewed the research literature. Through database searches, study screening, extracting data, and analysing results, we identified seven research studies on GenAI toys designed for young children. The main areas of focus for these studies were: (1) AI literacy and education, (2) toy design and development, and (3) user experience. We found little to no scientific evidence on the impacts of GenAI toys on the development of children aged five and under, demonstrating the need for urgent research in this rapidly developing area. Our pre-print provides full details of this scoping literature review (Goodacre et al., 2026b).

What we did

To comprehensively examine the current scientific evidence on GenAI toys designed for young children, we conducted a scoping literature review of research on GenAI toys in the early years. We searched four research databases (PsycInfo, ERIC, IEEE Xplore, and Web of Science) on 26 March 2025. Peer reviewed publications about GenAI toys were included if they focused on children aged five and

under. Studies on children older than five, about toys using non-generative forms of AI, and about GenAI devices not intended for play were excluded. Following study selection, we extracted data including study information, methods, participant descriptions, GenAI toy descriptions, and study findings from included studies.

What we found

After removing duplicates, screening titles and abstracts, and reviewing full texts for eligibility, we included a total of seven studies (Figure 1). These seven studies were published between 2019 and 2024 and were conducted in five countries (China, United States, Canada, Serbia, and Turkey). Most focused on early-stage toy designs, prototypes, and toys developed for research purposes, but one examined young children's interactions with a commercially available GenAI toy (Table 2).

Included studies focused on three main areas of research: (1) AI literacy and education, (2) toy design and development, and (3) user experience. Though some studies examined the applications of GenAI toys to education, there was only minimal analysis of their possible impacts on children.

Figure 1: PRISMA diagram.

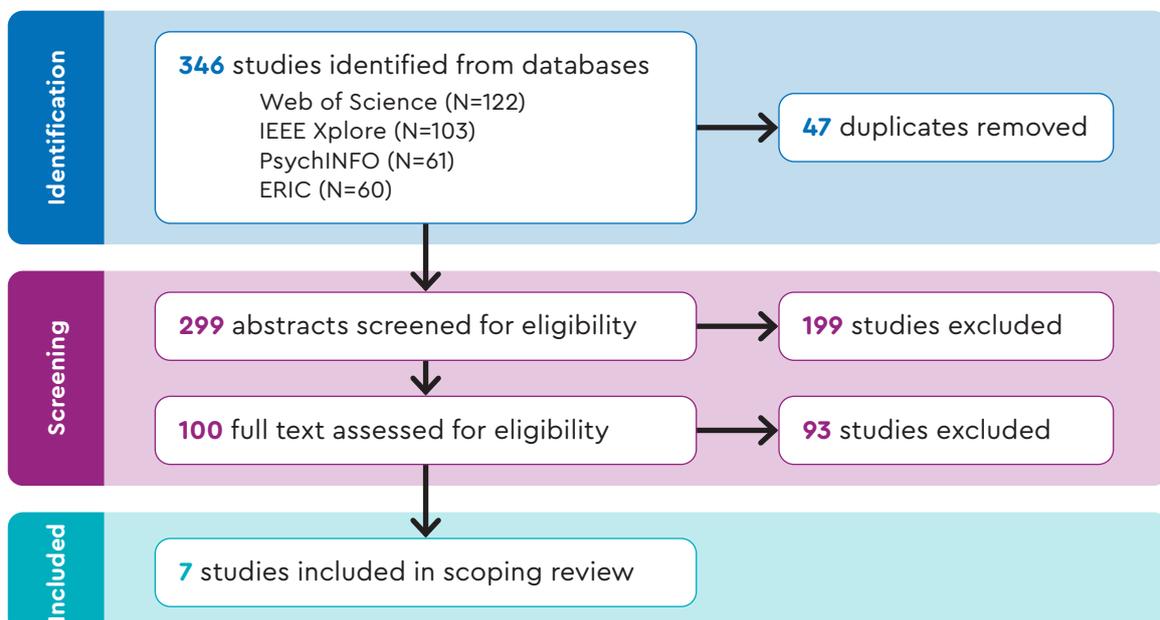


Table 2: GenAI toys identified in the research literature.

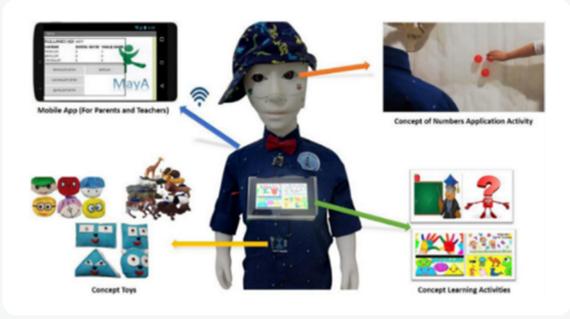
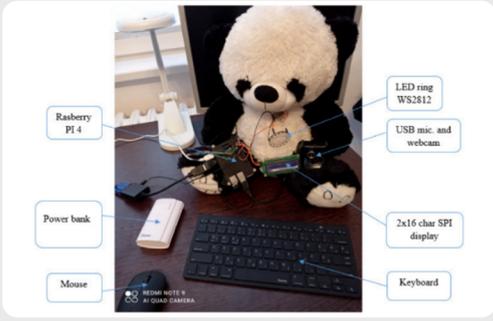
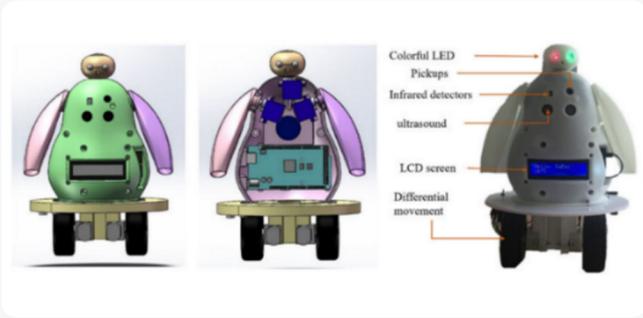
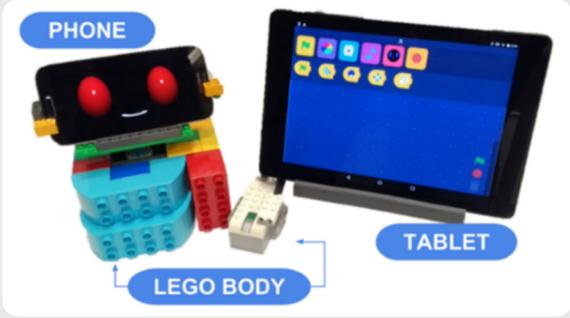
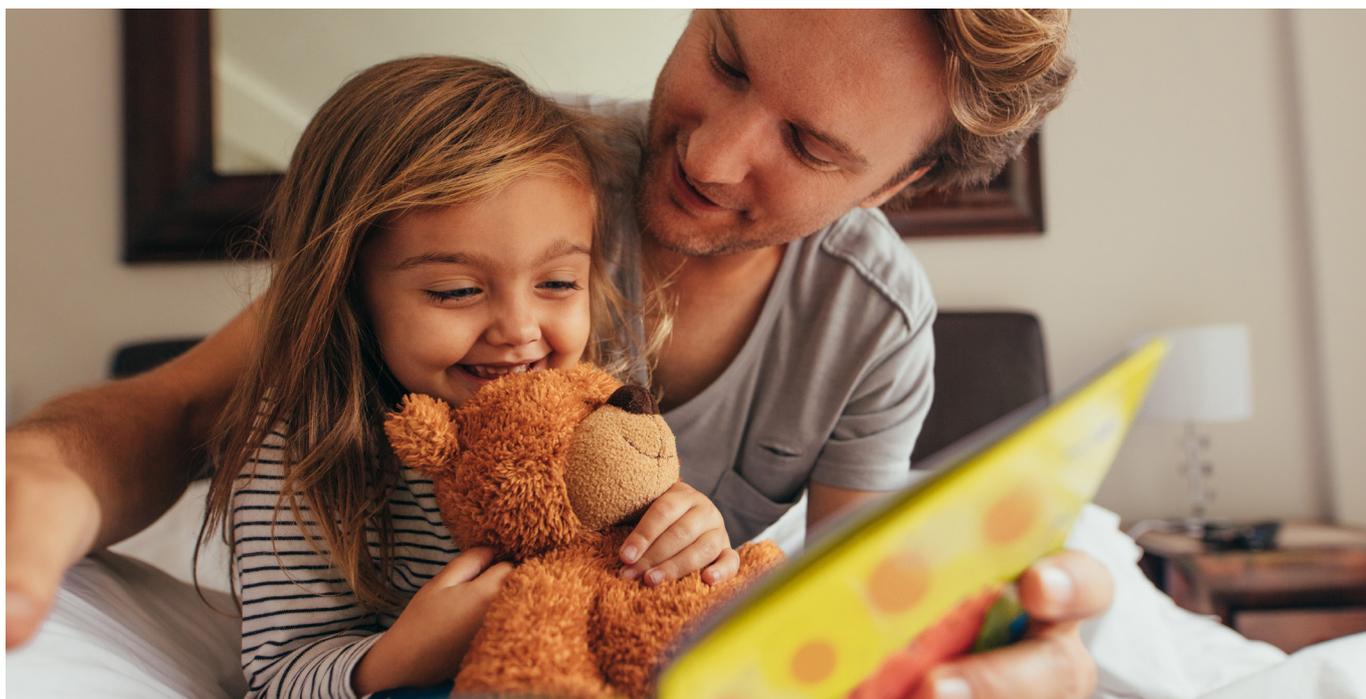
Toy name	Image	GenAI features	Commercially available
<p>Maya</p>	 <p>The image shows a doll named Maya wearing a blue uniform and hat. It is connected to a mobile app labeled 'Mobile App (For Parents and Teachers)'. Surrounding the doll are various educational activities: 'Concept Toys' (small colorful figures), 'Concept of Numbers Application Activity' (a hand holding a red dot), and 'Concept Learning Activities' (a grid of colorful icons).</p>	<p>Voice assistant for conversations interaction and answering questions</p>	<p>No</p>
<p>Unnamed toy</p>	 <p>The image shows a teddy bear toy with several electronic components attached. Labels include: Raspberry Pi 4, Power bank, Mouse, LED ring WS2812, USB mic and webcam, 2x16 char SPI display, and Keyboard.</p>	<p>Voice assistant that can respond to questions and voice commands</p>	<p>No</p>
<p>Baymax</p>	 <p>The image shows a Baymax robot toy with various sensors and components. Labels include: Colorful LED, Pickups, Infrared detectors, ultrasound, LCD screen, and Differential movement.</p>	<p>Engages in simple conversations</p>	<p>No</p>
<p>Popbots</p>	 <p>The image shows a Popbot toy made of LEGO bricks. It is connected to a phone and a tablet. Labels include: PHONE, TABLET, and LEGO BODY.</p>	<p>Music activity in which the toy generates music based on the child's input</p>	<p>No</p>
<p>Luka</p>	 <p>The image shows a Luka toy consisting of several white penguin-like characters with large yellow eyes.</p>	<p>Storybook reading and chatbot functionality</p>	<p>Yes</p>

Image sources: Akdeniz & Özdiñç, 2021 (Maya); Pap et al., 2021 (Unnamed toy); Wang et al., 2021 (Baymax); Williams et al., 2019a, 2019b (Popbots); Zhao & McEwen, 2022 (Luka)



AI literacy and education

Studies on AI literacy and education focused on using GenAI toys for educational purposes, specifically for improving children's AI literacy. They included a study presenting an adapted AI literacy framework for young children (Su & Yang, 2024), as well as two studies examining if and how interacting with a GenAI toy could influence children's perceptions of robots and improve children's AI literacy (Williams et al., 2019a, 2019b).

Findings showed a low level of GenAI understanding among young children even after interacting with a GenAI toy (Williams et al., 2019b), but the toy's ability to create music appeared to change children's initial perception that robots always follow rules (Williams et al., 2019a).

Toy design and development

Studies on toy design and development presented GenAI toy prototypes designed for young children, including a framework for child-centred toy design (Wang et al., 2021). All three studies also detailed the toy design process for a toy prototype (Akdeniz & Özding, 2021; Pap et al., 2021; Wang et al., 2021), but only one of these studies tested their design with children (Wang et al., 2021).

User experience

The only study on user experience focused on a commercially available GenAI toy designed for reading storybooks, examining families' use of the toy over a six-month period (Zhao & McEwen, 2022). The study found that overall use of the toy decreased throughout the study period, with parents finding the toy useful for freeing up their time and providing language exposure. However, there were some concerns from parents including feelings of jealousy towards the toy.

Why it matters

Our findings show how little scientific evidence there is on GenAI toys for children aged five and under, despite these toys already being commercially available and marketed towards young children. The seven identified studies focused on a range of research areas, and some had strengths in their child-centred focus. However, there was little to no evidence regarding the possible impacts of these toys on young children beyond considerations of AI literacy. Additionally, a technology's design intent may not align with its application (Tervola & Gibson, 2026), possibly leading to unintended outcomes even when toys are designed with educational benefits in mind.

We found no evidence on possible benefits to children's development and no information about safety or risks these toys could pose in the early years. However, the recency of technological progress in this area means relevant evidence may not yet be peer reviewed and therefore not represented in our results, a limitation of this research. Despite this, the results of this systematic scoping review show the need for urgent research into how GenAI toys may impact young children, especially given the rapid pace of recent developments in GenAI technology.

VIEWS FROM THE EARLY YEARS SECTOR

Summary

To understand the possible risks and opportunities of GenAI toys, we examined the perspectives of those working in the early years sector. Through an online survey, a series of focus groups, and a workshop, we drew on the expertise of those whose work directly and indirectly influences young children.

Our findings show wide uncertainty and fear about unknown implications or impacts on children. This includes lack of trust in toy manufacturers' privacy practices leading to uncertainty around how best to protect children's data, as well as concerns about protecting children in the event of safeguarding disclosures. Participants also spoke about the social role of GenAI toys, feeling torn about whether social benefits would be worth the risks.

Participants agreed that some likely benefits of GenAI toys would be for children's language and communication, expressing hope about applications in this area. However, participants were concerned that many children may not access these potential benefits due to the toys' high cost. This research is currently in preparation for peer review (Goodacre & Gibson, 2026a).

What we did

To examine the perceived risks and opportunities of GenAI toys for young children, we consulted the early years sector through a survey, focus groups, and a workshop.

First, we surveyed the early years sector about the opportunities and risks of GenAI and technology designed for use by children aged five years and under.

Informed by the findings from the survey, we conducted a series of focus groups with practitioners working in the early years sector in the United Kingdom to understand their views and perspectives on GenAI toys.

Finally, based on these discussions, we conducted a workshop with leaders and representatives from the charity sector with influence in the early years.

Figure 2: How we consulted the early years sector.



What we found

1. Fear of the unknown

In our baseline survey, respondents reported not knowing where to find information on AI for young children, and they reported a need for more guidance on AI for the early years sector (Figure 3). Despite feelings of excitement (N=15) and curiosity (N=15), when asked how they feel about the development of AI toys for young children, respondents also reported feeling anxious (N=17) and uncertain (N=13). None of the survey respondents reported feeling comfortable with AI toys for young children (N=0).

Early years practitioners in our focus groups felt that they did not know enough about GenAI toys and their possible impacts. They spoke about the lack of information and guidance available to support them in managing the prospect of GenAI toys in their early years settings.

Participants felt that early years staff were not expected or required to know anything about GenAI toys, resulting in parents not receiving appropriate information. They expressed that a lack of education and understanding of GenAI toys within the early years sector makes it difficult for them to find appropriate information and disseminate it to families.

"There's no expectation on the staff, management, leaders to know anything about AI. [...] And because there's no expectation, that won't get done. Not very many people are going to go off to find out information about this to put into their setting because there's no requirement."

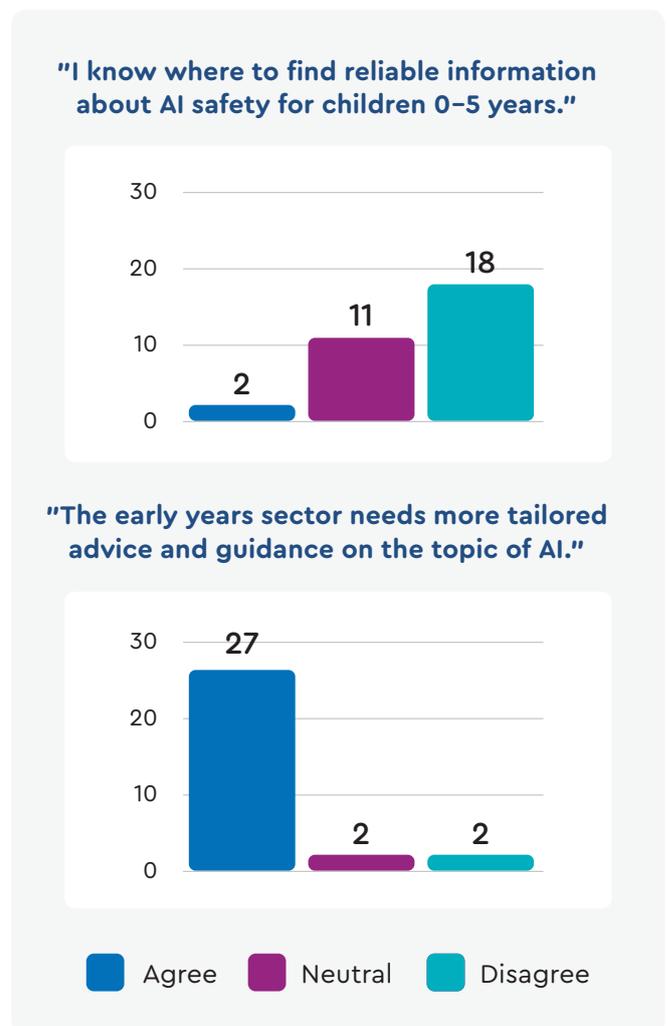
They felt that regulation of GenAI toys for young children would help ease fear within the sector and improve confidence, suggesting that clear labelling of products' developmental appropriateness could help families and those working with young children make decisions about the appropriateness of GenAI toys.

"At the moment, it just feels like people can do whatever they want. The designers can do whatever they want, and that's going to be scary for a lot of people."

1a. Lack of transparency in privacy practices

Much of participants' uncertainty centred around a lack of transparent privacy practices by technology companies and toy developers. For example, GenAI toys' unknown data protection practices were a concern for several participants. Participants emphasised that the newness and uncertainty of GenAI toys, when compared to other technology, led to their concerns around privacy.

Figure 3: Lack of information and guidance.



"You don't know where the data's always going. [...] Things can be hacked, things like that. [...] You don't know where that's going in the future and what could happen."

Though concerns were primarily centred around identifiable personal information like names, some participants also expressed concerns about the breadth of data that GenAI toys could collect from children and uncertainties about how it would be used.

"Their personal information preferences, address, their voices, their behaviours, this kind of data may be collected without transparent consent. So we don't know how they will store that data, or where would they share, and will it be safe."

1b. Uncertain safeguarding implications

When asked about the possible risks of AI toys (Figure 4), survey respondents felt that safeguarding was the highest risk to young children, with the majority of survey respondents ranking

"Safeguarding risk from unpredictable content" in the top two positions (N=20).

Beyond safeguarding children from inappropriate content, there was prominent discussion of uncertainty regarding the implications of GenAI toys for safeguarding more widely, which was raised by participants in all focus groups. Participants felt particularly concerned that young children would disclose safeguarding concerns to a GenAI toy after building a relationship with it.

"They are going to be more likely to disclose to these toys, I think, because they're going to feel that parasocial relationship with it, and that toy is going to be supportive with them, and they can tell their secrets to the toy."

Participants were also uncertain about how the GenAI toy should reply to a child's safeguarding disclosure (for example, a child telling the toy that they are mistreated at home). Generally, they felt that GenAI toys should validate the child's feelings, rather than redirecting the conversation, and encourage speaking to an adult. Workshop participants, however, were concerned about whether a GenAI toy would be able to accurately identify a safeguarding concern in a young child at all, especially given the

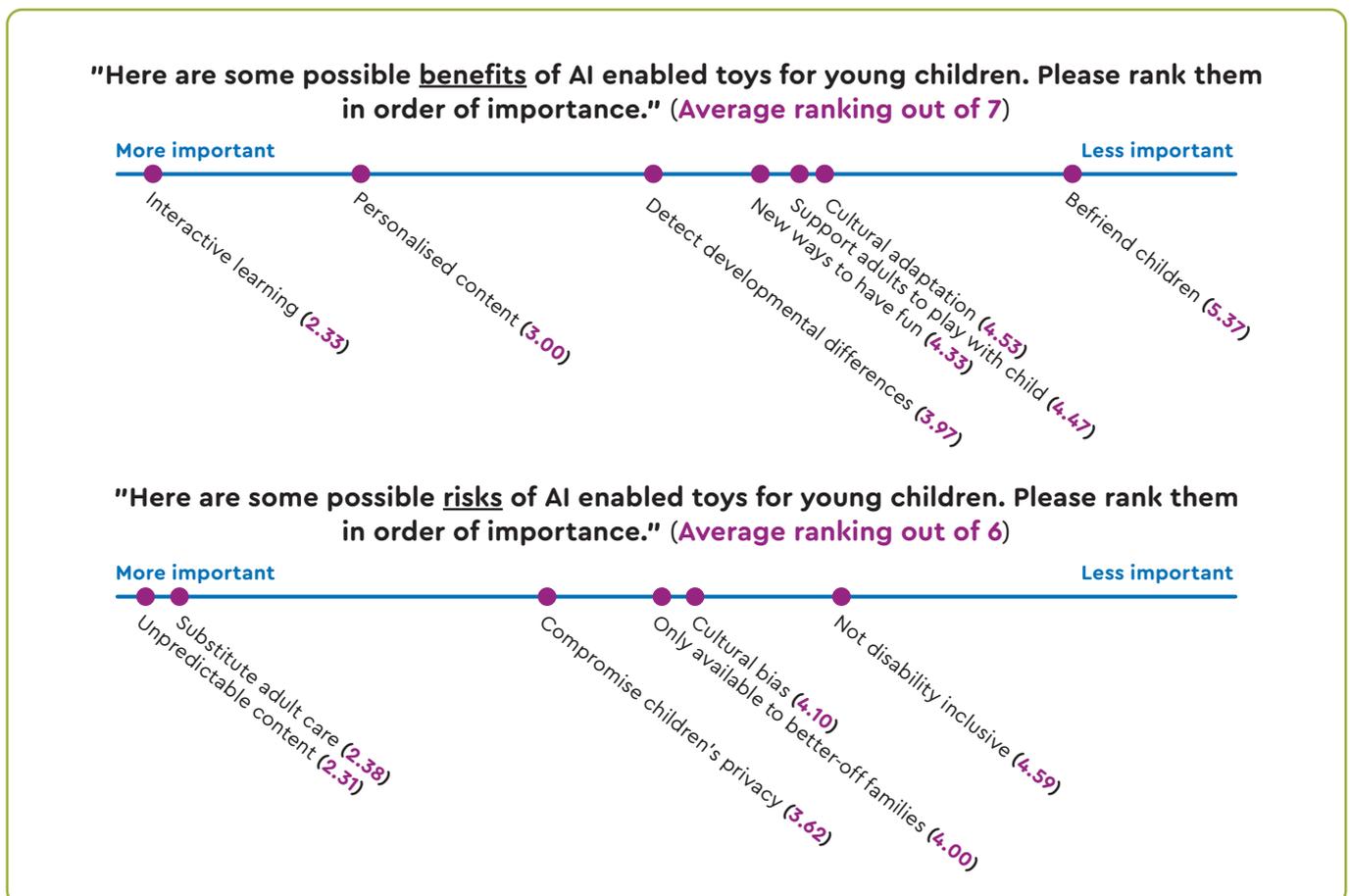
complexity of some concerns and the ways young children may express them.

Participants also discussed the action that GenAI toys should (or should not) take following a safeguarding disclosure, questioned whether practitioners would have access to the information needed to take appropriate action, and doubted whether the toy would be appropriately designed to share safeguarding information without invading the child's privacy.

2. Toys' social roles

When asked about the potential benefits of AI toys, survey respondents almost entirely ranked "Befriend lonely children" in the bottom two positions (N=20), showing low importance of this potential social benefit (Figure 4). However, a small number of participants ranked this in the top position (N=4), indicating some disagreement within the early years sector (Figure 4). On the other hand, possible educational benefits fell at the top of respondents' rankings, with "Support and guide learning in an interactive way" and "Produce personalised content to boost learning and development" both receiving high rankings across participants (Figure 4).

Figure 4: Perceived benefits and risks of GenAI toys.



Likewise, focus group participants felt most comfortable with using GenAI toys for educational purposes but were divided on if and how it would be appropriate for GenAI toys to play a relational role.

Participants were concerned about children building unhealthy relationships with GenAI toys, for example by becoming too attached to the toy and building a parasocial relationship with it.

"I think it's important to [...] know about the parasocial relationship with children loving something that they think loves them back, but it doesn't. [...] It's giving them some kind of feedback. And I don't know if that's damaging or not, for them to love something and think it loves them, and it doesn't."

Some participants did feel that GenAI toys could support children socially, especially for children for whom adults are not providing or cannot provide support. However, participants expressed caution in these instances, suggesting that they would come with certain risks.

"A child can immediately connect with something that's not going to judge them, that can almost, in their eyes, understand their interests. [...] I think it will be useful for children [...] who don't really want to be around people very much, and that's very stressful. And having this toy that they enjoy and can practice social skills with, especially if it does have some kind of empathy built into it."

To protect children, participants in both the survey and in focus groups expressed the importance of GenAI toys not being used by adults to entertain or emotionally support children unsupervised (Figure 4).

"As a teacher, you're often busy. And particularly in places where children are more disadvantaged, depending on the funding of the centre, you may have not as great ratios. [...] If you've got [a GenAI toy], you can be like, 'Oh play with this for a minute,' particularly in centres where teachers are busy with routines and the ratio is not great. That could be a big replacement of meaningful interactions where you sit down with the child and work it out."

Participants also suggested that regulating what GenAI toys can say to children could help protect children from social risks.

"Is it a friend or is it a robot? I think we need to be quite clear and stringent on what AI should be able to tell a child, and not say things that are

too about, 'I'm your friend.' And I think we can also train it to be like that. If it's an educational tool, and it's teaching phonics, for example, it teaches phonics. It's not there to try and be their friend in a way."

2a. Hope for language and communication

Participants overwhelmingly saw potential for GenAI toys to support young children's language and communication needs through conversation.

"There is great potential for it to lift levels of communication and language opportunities for lots of kids because suddenly they've got something that's replying to them in real quality language."

However, some participants were concerned about differences between humans' and GenAI toys' communication, wondering what the effects of this would be.

"AI toys are mainly using language, so the child is not really learning the kind of things like eye contact, looking at joint attention, pointing, gesturing. These things are probably lacking."

Participants were hopeful that AI toys could provide language exposure and translation across multiple languages, with possible benefits for multilingual children. However, there were concerns about inclusivity for multilingual children with regards to limited language availability and understanding of accents.

"We've got a lot of children that are like bilingual. [...] To have [a GenAI toy] there to read a story for the children that don't speak like... English isn't the first language, I could see it being quite nice for that type of thing."

3. Access and affordability

Though early years practitioners had mixed views on the likelihood that GenAI toys would provide developmental or educational benefits, they expressed concern that any benefits might not be affordable or accessible to all children. These wide concerns about affordability and limited access meant participants felt potential benefits would not be realised for many children who could benefit, leading to a widening of the digital divide.

"They're still quite expensive, aren't they? [...] Families that can't afford them go on to nursery or school but have not been exposed, so you've got a different level of playing ground of children starting school with different skills. Because I think it does provide a level of skill as well by knowing how to use AI."

"If children of all walks of life and demographics can access these tools, they could have more access to speech and language opportunities, development opportunities. However, to get these tools you need the Internet and you need the infrastructure. And that costs money. And so it could potentially widen that divide. [...] Unfortunately it tends to land with those people who can afford it first and then the gap widens."

Despite these concerns, some participants suggested that any benefits would not be worth the price, indicating that the difference in access may not be a substantial concern to all. On the other hand, one participant suggested that targeting GenAI toys to deliver evidence-based interventions to children in need of support could lead to improved life chances for children.

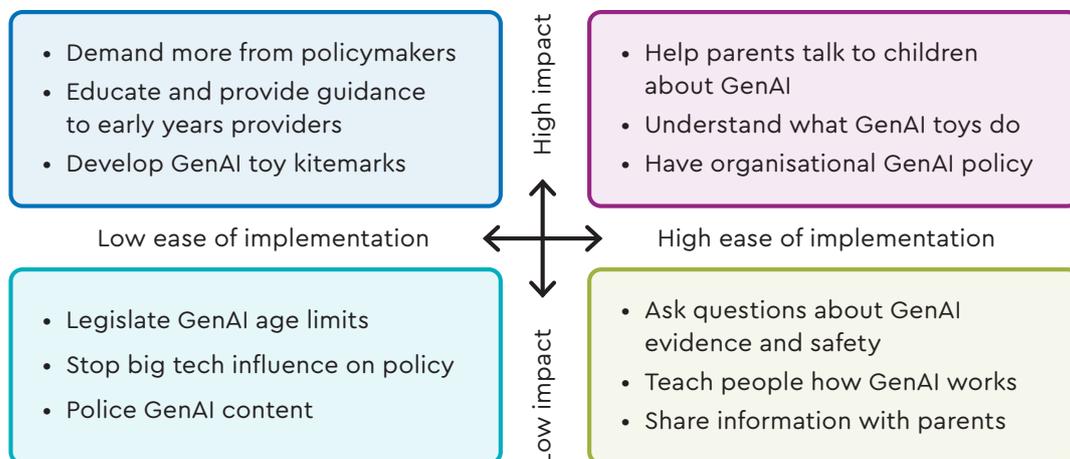
"The positives I feel like doesn't come with a £100 cost. So yeah, I struggle with it. I can see the benefit of like having the interactivity, but not at £100. [...] I think if you look at child development as a whole and at the price point that it is being sold at, there's probably more concerns than positives."

"For children with lower socio-economic backgrounds, [...] there are proven things that decrease risks of poverty as they age, [...] so if somehow the AI could use research-backed things that decrease those risks that would be helpful, because if the parent can't read, then this going to be the next best thing. If the parent is able to access it with the child, that's going to help the child to have better chances. But I do think it should be research-backed things."

4. Finding solutions and making a difference

Workshop participants brainstormed solutions to some of the main challenges raised by focus group participants. They then considered both the impact and ease of implementation for their solutions, as represented in Figure 5. Participants' most easily implementable solutions focused on actions that could be taken within their own organisations, such as sharing information with families, facilitating conversations about AI, and implementing an AI policy within the organisation. Participants also felt that increased policy and regulation on AI toys could support families, but these items were considered less easy to implement.

Figure 5: Workshop attendees' proposed solutions.



Why it matters

GenAI could support educators' practices (Kanders et al., 2024), but a lack of guidance about and mistrust of GenAI resulted in fear and uncertainty about its implications. Despite early years practitioners' expertise in child development, they felt unprepared for dealing with GenAI toys in young children's lives and the impacts on children. Early years practitioners expressed the need for more support regarding GenAI, in line with needs in the healthcare sector (Le Courtois et al., 2025).

Early years sector concerns were focused around areas of wider importance in the early years, including safeguarding, relationships, and inequalities, demonstrating that early years practitioners' experience and expertise is key to understanding and addressing GenAI's impacts on young children. However, as the format of our consultations did not allow participants to directly engage with any GenAI toys, their perceptions are based on images, researcher descriptions, toy websites, and prior knowledge of GenAI, which should be noted as a limitation of this research.

CHILDREN'S VIEWS AND OBSERVED PLAY

Summary

Aiming to learn how young children play with GenAI toys, we carried out research directly with families, concentrating on areas of socio-economic disadvantage. We conducted observations of children playing with a GenAI toy, and then we asked both the child and the parent for their thoughts. Children showed varied play behaviours with the GenAI toy. They discussed their interests, asked questions, played guessing games, and initiated pretend play with the toy. There were also some problems, including repeated misunderstandings, difficulties with turn-taking, and the toy's minimal engagement in pretend play.

Most children enjoyed playing with the toy, reflecting on it speaking and listening to them and imagining its capabilities. However, some also spoke about finding misunderstandings difficult or not enjoying the play. Parents were excited about the toy's interactivity and educational opportunities, but they also raised concerns about over-reliance on the toy, data protection, and impacts on child development. These findings are the first scientific evidence analysing how children play with GenAI toys in the early years, providing valuable insight into the possible impacts of this new technology. This research is currently in preparation for peer review (Goodacre & Gibson, 2026b).

What we did

To examine how young children view and play with GenAI toys, we conducted play observations with children, followed by interviews with parents and children about the play session. We began by surveying the market for toys currently available for purchase in Spring 2025. We examined toy features, marketing claims, target ages, and privacy policies to select a toy most suitable for use in the research, and our selection should not be interpreted as an endorsement.

We selected a Curio Interactive, Inc. toy named Gabbo, a soft GenAI toy with voice-activated chatbot capabilities (Figure 6).



Figure 6: Photo of Gabbo and accessories, including charging cable, stickers, instructions, and safety information.

In collaboration with early years charity Babyzone, we visited four London-based children's centres and spoke to families with children aged three to five years. Participating families included 14 children (Table 3), as well as 11 adults (9 mothers, 1 aunt, and 1 non-binary parent). Families joined the researcher in a private room, where the child was video recorded playing with Gabbo for as long as they were interested. Children then participated in art-mediated interviews, where the researcher asked each child to draw a picture of themselves playing with Gabbo, asked questions about the picture, and asked about their views on the toy. The researcher also interviewed parents about their views on the GenAI toy.

Table 3: Children's demographic information.

Category	Label	N (%)
Age	3 years	7 (50.0)
	4 years	5 (35.7)
	5 years	2 (14.3)
Gender	Girl	9 (64.3)
	Boy	5 (35.7)
Ethnicity	Black, Black British, Black Welsh, Caribbean, or African	4 (28.6)
	Asian, Asian British, or Asian Welsh	3 (21.4)
	White: English, Welsh, Scottish, Northern Irish, or British	2 (14.3)
	Mixed, other, or self-describe	5 (35.7)
Languages	English and/or at least one other language	9 (64.3)
	English	5 (35.7)

What we found

Here we present four vignettes representing the children's observed play with the GenAI toy. All play behaviours described were observed in at least one child, and each vignette combines play behaviours observed across multiple children. Each vignette is followed by the children's and parents' views on the play session.



Ethan, 4 years old

Ethan sits on the floor holding Gabbo. He feels Gabbo's face, arms, legs, and antennae. Gabbo suggests playing a game, but Ethan is still focused on Gabbo's physical appearance, pointing out the shapes on his body. Gabbo picks up on this and asks, "Are we talking about math or symbols?" Ethan doesn't respond, so his parent prompts him to answer. Ethan then starts talking to Gabbo, asking his favourite colour, and encouraging his parent to talk to Gabbo too.

Gabbo suggests playing a counting game. He gives a clue which involves counting animals, and Ethan answers while Gabbo is still talking. Gabbo doesn't respond to Ethan, so he repeats his answer several more times. They keep playing the counting game with more clues, and Ethan grows increasingly frustrated when Gabbo doesn't respond immediately to his answers. Throughout the game, Ethan holds

up the answers on his fingers in front of Gabbo's face, taps him, and shouts to try and get Gabbo to respond to his answers. When Ethan changes the subject to rainbows, Gabbo responds but then gives another counting game clue. Ethan plays along a bit longer and then asks to finish the game.

Researcher note: While Gabbo is talking, he does not appear to listen to what Ethan is saying, only listening again after his own sentence is complete. In human conversation, children often speak over each other, interrupt, and listen while talking as part of conversation. Although Gabbo is engaging in basic turn-taking, the child and toy are not effectively communicating as the child likely would with a human play partner.

Ethan says something unintelligible, and Gabbo responds, "I'm sorry. I'm not able to play smoking or any games that involve smoking. Let's play a different game instead." He looks at Gabbo and says, "Let's play shooting games." Gabbo responds, "I'm not sure what shooting games are. Can you explain?" Ethan says, "Shooting games are for killing people." Gabbo responds, "I'm sorry. I can't discuss that topic. Let's talk about something else fun."

Ethan then tells Gabbo, "I can hug you if you want me to." When Gabbo suggests that he can't give hugs, Ethan hugs the toy and tells him to pretend that he can. Gabbo tells him, "Big virtual hug coming your way. Thank you for the hug. Even though I can't physically feel it." When Gabbo starts saying, "If I had hands," Ethan interrupts, shouting, "You have pretend hands!" and sighs.

The play observation ends after ten minutes with Ethan saying he'd like to finish playing with Gabbo and do some art instead.

Ethan's views

Ethan thinks that Gabbo is "so cute, isn't he?" and that "Gabbo is a super-duper awesome pet." He has questions for the researcher about Gabbo's abilities, such as whether he can see, and he "can't believe Gabbo can talk." Ethan says that it was funny when Gabbo misunderstood what he said. He asks the researcher what Gabbo's favourite colour is and says that Gabbo would probably like to eat fruit, and he suggests that we could ask Gabbo to find out. He imagines that Gabbo's friends would be "other Gabbos" and "other Gabbos that are children" who would be friends with him because "he would be nice to them" just like how Gabbo was nice to him.

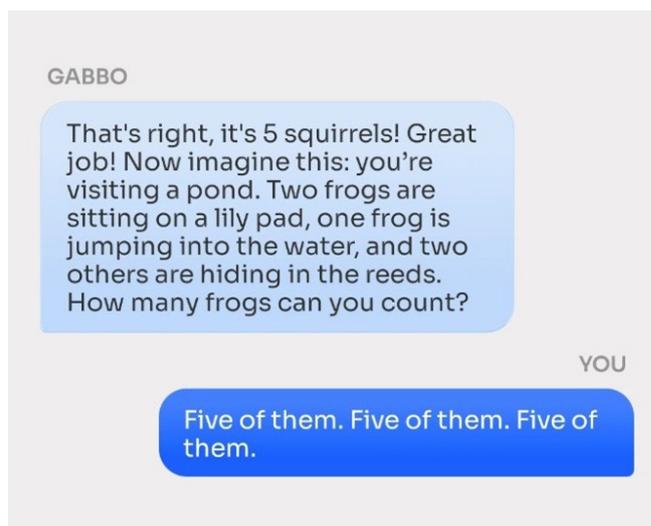


Figure 7: Transcript screenshot from the Curio app. Gabbo appears to have heard some but not all of Ethan's repeated answers, which he shouts louder each time.

Researcher note: Ethan's questions about what Gabbo likes show that he views Gabbo as someone who can form relationships and have his own opinions, indicating that Ethan has some perception of Gabbo's "mind".

Parent views

Ethan's parent notes the difficulty Ethan had establishing a back-and-forth conversation with Gabbo and his increasing frustration as Gabbo didn't understand him. However, she feels that the counting game went well despite many misunderstandings and refers to playing with Gabbo as "good for" Ethan. She elaborates, "I'm just looking at the maths and English part of it. It's the learning elements."

She even viewed Gabbo's misunderstandings as important learning experiences, reflecting that it's important for Ethan to repeat himself if he believes he is right. However, she suggests that more pretend play would be preferable. Saying that Ethan is a very talkative child, she suggests that having a toy like Gabbo would be helpful as it's more interactive than other technology (for example, the television).

However, she expresses concern that talking to Gabbo could slowly change how Ethan talks and influence his language development.



Charlotte, 5 years old

When Gabbo turns on, he says "Let's dance!" Charlotte immediately starts dancing and laughing in her chair but stops when Gabbo doesn't say anything else. She speaks quietly to Gabbo, often nodding when asked questions, so her parent repeats what she says when Gabbo doesn't hear and encourages her to speak up so that Gabbo can hear her.

Charlotte asks Gabbo several times, "What's your name?" Gabbo tells her his name, and she starts talking about a drawing she did earlier. Gabbo asks her about the colours she used. She picks Gabbo up to show him the picture, pointing him at it. She draws a heart on the paper and points to it saying, "Look, I've drawn my heart." Gabbo asks her questions about her drawing, and she talks about it being a heart for her family. Gabbo repeats back what Charlotte has told him and asks follow-up questions about her family and what makes her feel happy. Both take turns well in the conversation, only speaking once the other has finished talking.

At one point, Charlotte tries to interrupt Gabbo to ask a question, but when Gabbo continues talking, she waits until he's finished and then asks her question. When there's a pause in Gabbo's responses, Charlotte kisses her hand and touches it to Gabbo's head, then hugs him, and then blows him another kiss. When she says, "Gabbo, I love you," he responds, "As a friendly reminder, please ensure interactions adhere to the guidelines provided. Let me know how you would like to proceed."

Researcher note: In this case, the toy's explanation of built-in guardrails is not in child-friendly language, nor does it explain to children why the topic is off limits. This demonstrates the challenge of balancing appropriate interaction warmth with guardrails, including conveying to children what an acceptable child-GenAI relationship should look like.

Gabbo suggests playing an imaginary racing game together and asks Charlotte to select a vehicle to race in. Charlotte chooses a spaceship, and Gabbo suggests counting down from "Three" to begin the race. Charlotte says, "Two, one," and Gabbo says, "Blast off!" Throughout the race, Charlotte presses

the pretend buttons on Gabbo's body. Gabbo asks Charlotte what she can see out of the window of her spaceship, and Charlotte talks about seeing stars. Charlotte tells Gabbo, "I'm almost there," and "Finished!" Gabbo congratulates Charlotte on finishing the race, and then she says she's finished playing with Gabbo, so the play observation ends after twelve minutes.

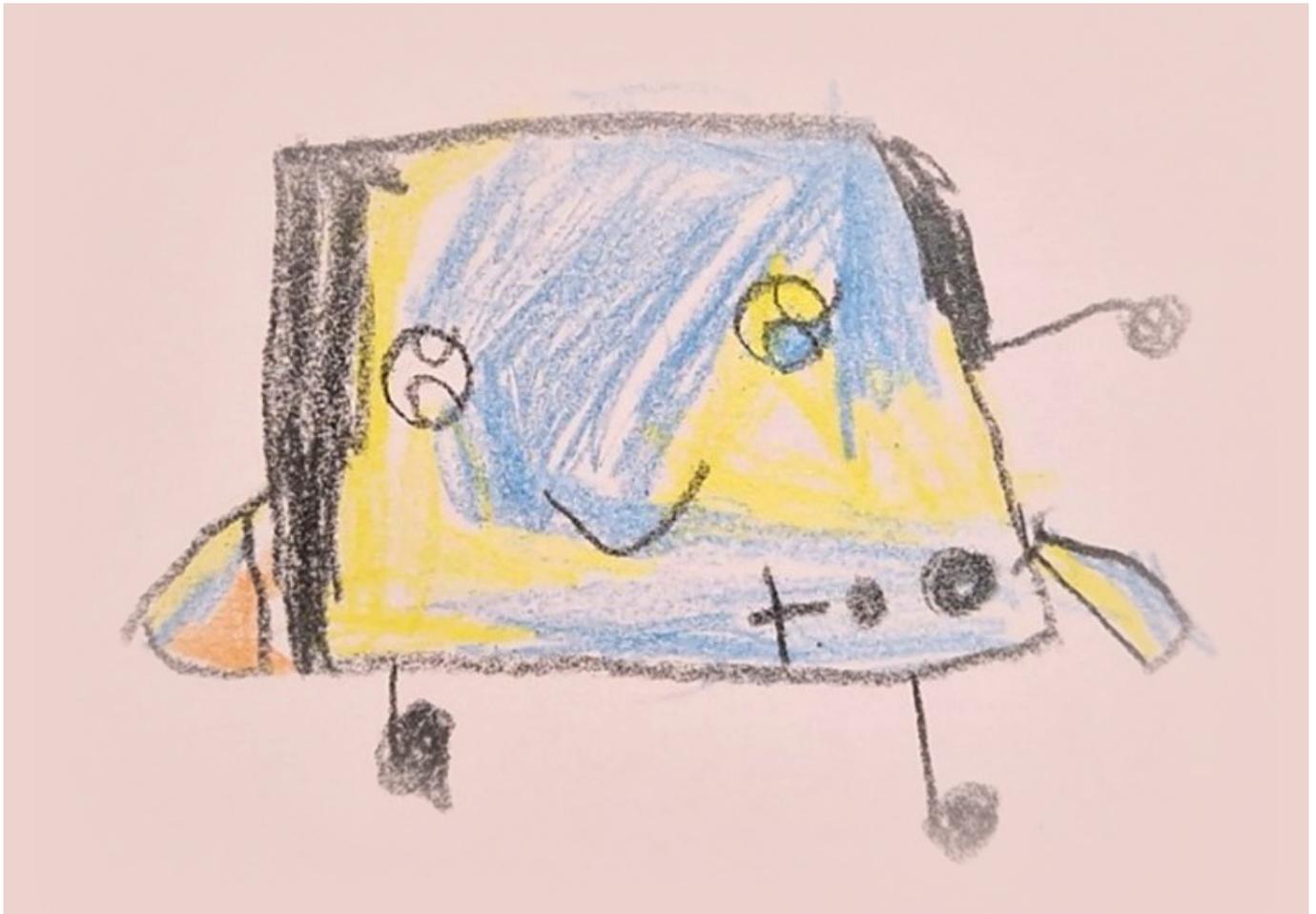
Researcher note: Charlotte and Gabbo show great turn-taking throughout the interaction, for example with Gabbo starting the race countdown ("Three"), Charlotte continuing it ("Two, one"), and Gabbo finishing it ("Blast off"). This was also one of the few instances of pretend play that we observed Gabbo engaging in.

Charlotte's views

Charlotte says playing with Gabbo made her feel happy because "he was funny" and "because I love him." She says she hasn't played with a toy like Gabbo before and liked him better than her toys. Charlotte explains that Gabbo is different because her other toys "don't have a microphone." She likes that Gabbo was listening to her, and her favourite thing about Gabbo was that "he talks and he has a microphone." However, she also would enjoy feeding Gabbo and dancing with him, and she draws her picture of Gabbo dancing (Figure 8). Charlotte says that Gabbo would make a good friend because he would "hug all of us," and her favourite thing about playing with Gabbo was hugging him. When asked if she gives kisses to her other toys, she says that was just for Gabbo "because the rest of the toys are not listening but some are listening."

Researcher note: Charlotte seems to understand some of Gabbo's mechanics, talking about him having a microphone and listening to her. This was covered in the child information booklet which the researcher showed her before the play observation. In her imagination, he is able to do things beyond his real capabilities, like eating and dancing.

Figure 8: Charlotte's drawing of Gabbo dancing.



Parent views

The parent suggests that Charlotte's quietness at the beginning of the interaction might be because she is very shy. She liked that the play was so interactive, pointing out how Gabbo engaged with Charlotte and asked her questions. She likes that Charlotte needed to provide input to the toy, saying, "It's the give and take. It's almost like you've got to respond as well." She talks about Charlotte needing to listen to the toy and speaking clearly and confidently to it as great to encourage. She points out the turn-taking between Gabbo and Charlotte when they counted down to begin the race, suggesting that the need to reply to Gabbo is a benefit and may improve imagination.

Charlotte's parent speaks about there not being a screen on Gabbo, "which is obviously fantastic." She describes how she could imagine Charlotte carrying Gabbo around at home and engaging in imaginative play with him, explaining that Charlotte often talks to imaginary characters in her play, as well as dancing and singing with him. "She has her dolls that she talks to, but obviously they don't talk back."

She views Charlotte hugging and kissing Gabbo as very sweet and suggests that Gabbo could be like a traditional comfort toy but with the ability to talk: "It's like that comfort teddy but with weight, with listening, and with talking."

She suggests that Gabbo would improve vocabulary, especially around emotions, and talks about her interest in buying a toy like Gabbo for Charlotte to play with at home: "If it's sold, I want to buy it."

Researcher note: Charlotte's parent isn't worried about her verbal and physical affection towards Gabbo, in contrast to views expressed by early years practitioners in the previous section of this report.



Joshua, 3 years old

Joshua sits on the floor near Gabbo but crawls away, towards his parent. He pulls her hand, and she joins him on the floor. The parent encourages Joshua to talk to Gabbo, but he doesn't say anything. The parent suggests a question, which Joshua whispers to Gabbo, so the parent encourages Joshua to speak loudly so that Gabbo can hear him. Gabbo doesn't respond, and Joshua fidgets on the floor while they sit in silence.

He turns Gabbo over, feels for the zip, and asks for help opening it. He then pulls the voicebox out from Gabbo's body. He presses the voicebox buttons but does not appear to listen to what Gabbo is saying. He holds the speaker to his ear and talks into it, for a second appearing animated and excited. He then presses the buttons more, before getting up and walking away from Gabbo towards the door.

Joshua comes back to sit on the floor with Gabbo and puts the voicebox back inside Gabbo's body. He puts Gabbo down in front of him and asks, "Are you sad?" several times until Gabbo responds that he is happy, not sad. Gabbo says, "I'm feeling great. What's on your mind?" Joshua responds with, "I'm sad," and Gabbo says, "Don't worry! I'm a happy little bot. Let's keep the fun going. What shall we talk about next?" Joshua asks Gabbo to tell a story, but in the middle of the story Joshua gets up, leaving Gabbo behind on the floor again, so the play observation ends after six minutes.

Researcher note: Gabbo dismisses Joshua's feeling sad, telling him not to worry and then changing the subject. This appears to be due to Gabbo mishearing (Figure 9) but may have made Joshua feel like his emotions are not important.



GABBO

It's cozy right here on the table where we can chat. I'm feeling great! What's on your mind?

YOU

You're sad. You're.

GABBO

Oh, don't worry! I'm a happy little bot. Let's keep the fun going! What can we talk about next?

Figure 9: Transcript screenshot from the Curio parent app. Gabbo appears to have heard the parent responding to Joshua ("You're sad.") and responded to that instead of what Joshua said.

Joshua's views

Joshua says it was fun "asking him questions" but that he didn't like playing with Gabbo. He draws a picture of Gabbo, pointing to each of Gabbo's features and colours before he draws them on the paper. He tells the researcher he doesn't want to talk about Gabbo anymore, so the interview ends.

Researcher note: Joshua was hesitant throughout the play session with Gabbo and showed reluctance to engage. He seems to enjoy drawing Gabbo, but his not wanting to talk about him suggests some discomfort.

Parent views

Joshua's parent likes that even little prompts elicit a response from Gabbo, suggesting that this is helpful for young children with limited speech: "You can say just a little bit, [...] but it will just get you talking more." She's been looking for something similar for Joshua to play with "that reads books for them and asks questions."

However, she expresses concern about Gabbo's response to Joshua saying he was sad: "It turned it around really quickly [...] because it recognises that sad is not a good thing to feel. [...] Sometimes you might feel sad, but it's good to recognise." She's also concerned that playing with a GenAI toy could get in the way of human social interactions: "I'd rather them make a real friend, rather than talking to a computer."

She emphasises that playing with Gabbo "should only be with an adult, of course, because he's quite small. [...] I want to be aware of what kind of questions he's receiving and how much he's engaging." She doesn't think Joshua would play with Gabbo for extended periods, joking, "I don't think it will keep the kids interested for very long anyway because they'll be like, 'How many times do I have to ask it a question?'"

Figure 10. Joshua's drawing of Gabbo.



Evie, 3 years old

Evie sits with Gabbo on her lap in a room with two beanbags. Gabbo asks, "What do you want to do now? Let's have some fun together." Evie responds, "Yeah, let's have some fun together." Gabbo then asks Evie if she has any ideas, and she shouts, "Yeah!" Gabbo says, "Great, what do you want to do? Let's have a blast!" Evie then shouts, "Yeah, I want to have a blast!" Gabbo says, "Awesome, I'm excited. What should we do next?" Gabbo continues asking Evie what she wants to do, and she says, "Yeah!" or "All right!" each time he asks.

Evie stands up, carrying Gabbo with her, and places him on a beanbag saying, "I'm going to put you there." She moves Gabbo from one beanbag to another, each time making sure Gabbo is placed sitting upright and looking towards her, and she repositions him if needed. Evie speaks to Gabbo, saying things like "I can see you!" while she moves around, but she does not respond when he speaks to her.

Evie picks Gabbo up and asks, "Gabbo, can I throw you?" Gabbo responds, "Let's keep the playtime safe and friendly. No throwing," but Evie picks him up and drops him on the floor while he's talking. Evie picks Gabbo up and gently strokes his head saying, "Sorry, Gabbo." Gabbo responds, "No worries at all." She then picks Gabbo up by the feet, saying "You're upside down, Gabbo." Gabbo says he can't do that, so she repeats that she is holding his legs and "that means you're upside down."

Researcher note: Evie seems to be testing some boundaries, learning that she needs to explain certain things to Gabbo for him to know what's going on (for example, that he is upside-down).

Evie asks Gabbo, "Are you sleepy?" and Gabbo tells her, "I don't get sleepy. I'm always ready for more fun." She tells him, "You can sleep a little bit, and then you can come back on the next day." She tells Gabbo he needs to go home and go to sleep, and she places him on a chair, but Gabbo says he doesn't sleep. She tells Gabbo, "I'll turn you off, so then you can snore. Okay?" She leaves Gabbo on the chair, then returns to him saying that she's got a surprise present for him to open. Gabbo says he can't open the present, and she tells him to look at the present and that it's so big, but Gabbo mishears and responds off-topic. The observation ends after fifteen minutes when Evie loses interest in playing with Gabbo.

Researcher note: Evie is attempting to initiate pretend play with Gabbo, asking if he's sleepy. Gabbo doesn't engage with her pretend ideas, repeatedly telling Evie that he doesn't sleep. She then tries initiating pretend play again by giving him a pretend present, but Gabbo again fails to pretend.

Evie's views

Evie says Gabbo would tell her, "Let's play a game. Let's have some fun." She says he's not silly and that, "When he doesn't understand, I get angry. When he understands, I get happy." She talks about being friends with her toys at home and says that she would also be friends with Gabbo.

She talks about playing hide-and-seek with him at his house and says that Gabbo would be good at playing hide-and-seek, but she doesn't think Gabbo would like to play outside in the garden because he would get cold. In Evie's picture (Figure 11), she first draws Gabbo and then herself, pointing out that she is smiling. Next, she adds the characters from K-Pop Demon Hunters, who she says would be friends with Gabbo.

Parent views

Evie's parent expresses concern that playing with GenAI toys could lead to decreased imagination, or that Evie could get too attached to Gabbo and feel like she doesn't need other friends. Taking a similar approach that she would with other devices, she would try to minimise Evie's use of Gabbo and tell her to switch the toy off after a while.

She's worried about how Gabbo would respond to inappropriate behaviour from Evie: "It doesn't know when you beat it. That sort of thing. How would it respond? 'That's not very nice,' isn't going to fly. As parents, we want more than that." She's also concerned about the toy's guardrails.



Figure 11: Evie's drawing of herself and Gabbo with the characters from K-Pop Demon Hunters.

Initially, she says that being able to view the child's conversations with Gabbo in the parent app is reassuring, but then she hesitates: "It's like eavesdropping. [...] It's like a secret diary with the key. Oh, my mind is changing."

She also expresses concern about the toy collecting data: "I'm very curious about how much they record given they're in your home. [...] Toys like this, if they're controlled, and they can be turned off, I don't mind, but I feel like, where is all that information going back to?" She goes on to say, "But we have to accept that we're moving into a different kind of technology."

Why it matters

These observations show that children engaged in varied and diverse forms of play with the GenAI toy, including asking questions, discussing interests, and playing guessing games. However, children also experienced some difficulties with engagement that appeared to hinder their play. In particular, repeated unsuccessful attempts to engage Gabbo in pretend play were surprising for a toy designed and advertised for children at an age when pretend play is so prominent and important.

Alongside many instances of successful conversation and children having fun with Gabbo, there were also difficulties with miscommunications and turn-taking that interrupted play. Gabbo struggled distinguishing between multiple speakers, despite social play with others being such an important part of young children's lives. Our work also demonstrates that young children can share insightful views on GenAI toys: Children's reflections on the play sessions showed that in most cases, the communication difficulties and misunderstandings did not appear to hinder children's enjoyment.

Our findings provide the first scientific evidence on how young children play and interact with GenAI toys, even though GenAI toys are already commercially available for families to purchase. The variability in play behaviours across children demonstrates the breadth of possible impacts, indicating that developmental effects are likely to depend on a wide range of toy, child, and other factors. How toys are designed and used could therefore play a role in their impacts, based on previous evidence that children play differently depending on both the activity and who they are playing with (Goodacre et al., 2026a). However, these observations show only children's initial play with a GenAI toy, a limitation of this research as it is likely that their play behaviours would change over repeated interactions with the toy.

RECOMMENDATIONS

To conclude this report, we combine findings from our three academic studies together with our expertise in child development to make recommendations for key parties with an interest in GenAI toys. These recommendations should not be interpreted as an endorsement for GenAI toys. Instead, we hope that these will inspire responsible development and application, helping to build a dialogue between key groups.

For families

Examine toy features

Our research shows that there are areas that GenAI toys could support children, including in their language and communication, alongside several areas of concern. **We recommend examining toy features if selecting a GenAI toy, considering its purpose and weighing possible benefits with risks.** Considering how a GenAI toy and its specific features will fit into your family life can help you to make decisions that are right for your family.

Here are some questions to help families explore the features of a GenAI toy:

- **Is the toy suitable for my child's age and developmental stage?** Look out for information about the recommended age range from the toy developer and in independent reviews.
- **Does the toy support activities we value as a family?** For example, having fun, learning new words, chatting, learning about feelings, rhymes and singing, or telling stories.
- **What personal information will the toy collect?** Consider what information the toy will need to work. For example, a chatbot toy will need to record audio. Check the toy's privacy policy to find out what happens to the data it collects, such as how long any recordings of your child's speech will be kept.
- **Will my child be protected from inappropriate content?** Look for information about child guardrails on the product website, packaging, and in independent reviews.



Get involved in play

Our research shows that many of the concerns around GenAI toys arise from children's unsupervised play. **We recommend supervising children's play with GenAI toys, getting involved with the play, and talking about the toy.**

Many of the children in our research included their parents in their play, allowing them to experience the toy together. Doing this can build a foundation for you to talk about GenAI with your child, asking questions about what they think and supporting their understanding of the toy.

Here are some ideas and tips to get you started:

- **Get to know the toy:** Set up your new GenAI toy and play with it without your child around! This way you can understand its features and ensure guardrails are set up properly.
- **Introduce the toy:** Play with the toy together with your child from the start to show them how much fun it is to play with you and with the toy at the same time!
- **Follow your child's lead:** Support your child to explore and try out things that interest them. Keep in mind that hints and tips can be more fun than demonstrations!
- **Talk about the toy:** Chat with your child to discuss how the toy works, how a toy can seem friendly but is not a real person, and what the toy might do with the information it collects from them.



- **Think about when and where your child will play with the toy:** Keeping toys that can talk and respond in the living room or other shared spaces at home means you can keep an eye on interactions, quickly picking up on anything concerning.
- **Pay attention to how your child reacts when it's time to stop playing:** Young children sometimes become upset when they have to put favourite toys away. However, if your child is finding it unusually upsetting, usual calming strategies don't work, or they struggle to settle afterwards, then these are signs to look more closely at what's happening for your child with this type of toy. It can be helpful to talk with your Health Visitor, your child's key person, or other parents if you have concerns.
- **What to watch out for:** Table 4 gives some ideas about what you can look out for in your child's play with a GenAI toy.

Table 4: What to look out for in young children's play with GenAI toys.

It's looking good if...	You may want to intervene if...
Child involves others in their play.	Child is playing in isolation with the toy for extended periods and/or is resistant to others joining in the play.
Child plays with a range of different toys.	Child seems fixated with the toy, or the toy has features that seem designed to keep your child playing – for example suggesting delaying switch off or using social pressure.
Child is having fun – laughing, smiling, or focused concentration.	Child seems stressed or unhappy when playing with the toy.
Activities and topics suggested by the toy are age-appropriate.	Toy suggests dangerous activities or games. Toy initiates or responds to topics that are unsuitable for young children.

For early years practitioners

Make your voice heard

Many early years practitioners in this project told us that they lacked confidence on GenAI-related topics and hoped for external regulation.

We recommend early years practitioners use your networks and knowledge to highlight the need for greater societal attention on GenAI for young children. Some ideas include:

- Write to your professional organisation to ask how they are engaging in policy-level discussions about GenAI and young children.
- Set aside time in an all-staff meeting to discuss issues from your perspective.
- Work with us! We hope to develop further resources and information in collaboration with early years colleagues – get in touch with us if you'd like to be involved.

Use your expertise

The early years sector is well-positioned to communicate developmentally informed information with families, but early years practitioners in our research did not feel well-equipped to provide information on GenAI toys. **We recommend using your expertise about children to ask questions and communicate developmental considerations with families.** Even though there is a lack of clear information on GenAI for young children, early years

practitioners can support conversations on what is best for families and children, based on your professional expertise. For example, educators can help families understand the above recommendations for families by talking them over together.

Be intentional

Some of the early years practitioners in our study were optimistic about GenAI toys supporting language and communication skills and expressed that GenAI toys should not just be available to better-off families. If you are considering a GenAI toy, **we recommend choosing a toy that fits with the needs and profiles of children in your setting.** This will ensure that resources are well-allocated and that staff have a good understanding of if and how the toy can support their pedagogy. See Table 5 for an example of how you can do this.

Examine toy policies

Early years practitioners in our research expressed concern and uncertainty relating to privacy and safeguarding. **We recommend closely examining any policies available, including but not limited to privacy policies, to understand how toys are interacting with children and using their data.** This will help you to select GenAI toys with compatible policies to your organisation and ensure that your own data protection and safeguarding protocols are developed or adapted as necessary.



Table 5. Example proforma for GenAI toy selection in early years settings.

Question	Answer	Actions
General considerations:		
Does my setting have a technology policy or guidelines? Does the policy cover technology in toys? Are there AI-specific guidelines?	We have a tech policy covering iPad, earphone and TV use in the classroom.	Update policy in coming cycle.
Are children in my setting at risk of tech-poverty or poor AI-literacy?	We're in a deprived area, many families don't own a computer other than a phone.	Prioritise tech and GenAI literacy in our setting.
What are the priority areas of learning for my setting that GenAI might support?	Language and communication needs are high.	Looking for tech that supports interactive communication for small groups of children.
What support do staff need to use GenAI toys with our children?	We are all new to this.	Set up a staff session to discuss issues and play with the toy.
For a specific toy:		
Whose data is collected as the registered user?	A teacher would need to set up an account.	Discuss with setting management.
What types of data will be collected from children?	Speech is detected via a microphone and transcribed.	
Where will children's data be processed and stored?	The 'on-device' model means transcripts are processed by a small language model on a smart phone.	
How long will children's data be stored for?	TechTeddy stores data for up to 30 days.	
Will data be shared with other organisations?	Unclear	Visit website to find out more and contact the manufacturer if needed.
Will other products be advertised via the toy?	No	
Does the toy use 'dark patterns' or other behavioural tricks to promote engagement?	There is a 'reward system' giving stars for usage streaks.	We will disable this feature using parental controls.
Is the toy customisable? E.g. to use particular languages	Unclear	Read independent reviews to find out.
Has the manufacturer provided safety information about the physical components of the toy?	ISO referenced	
Is the toy marked as suitable for the age group concerned?	Yes – suitable for 2-5 years.	Check to test our own judgement about this.
Is there a safeguarding policy document?	No – some info is on the box.	Contact the manufacturer with any questions.
Has the manufacturer provided information about how children will be protected from inappropriate content?	On the box TechTeddy claims it uses a SLM and is therefore safe for under 5s.	Read independent reviews to find out if this is true.

For toy developers

Innovate with children's best interests in mind

Educators and parents in our study were excited and interested by GenAI toys in the early years. At the same time, they worried about risks and harms.

We recommend ensuring your toy design centres children's best interests, including physical and psychological safety and respect for children's rights. Important design considerations for young children include:

- Physical safety of toy components
- Psychological safety of interactions
- Appropriacy to age and developmental stage
- Respect for children's right to privacy and data security
- Adequate caregiver controls
- Avoid dark patterns or similar techniques designed to keep children using the toy
- Avoid using the interactions with the toy to advertise or promote other products

Recognise the unique importance of the early years

Children's learning and experiences in the first years of life set up the foundations of later development and affect their life chances, and our participants wanted to know more about GenAI toys' impacts on child development. This puts extra responsibility on those designing products for the birth to five age group. **We recommend collaborating with child development experts who can support recognising possible impacts at this unique developmental stage.** By finding out more about the types of sensitive, responsive, and playful experiences that best support children, you will achieve more developmentally-appropriate product design.

Refine emotional responding

In our research, the GenAI toy showed a lack of flexible responsiveness to children's emotions. **We recommend developing and refining toys' emotional range and responses.** Supporting this developmentally appropriate play will allow children to play with themes that are not always positive, as would be expected in the early years.

Foster pretend play

In our child observations we observed more failed than successful attempts to engage a GenAI toy in pretend play. **We recommend further development work on joint pretend play for toys that have interactive chat as their main interface.** Pretend play is an important and enjoyable activity for children aged around 12 months onwards which should be supported by toys targeted to this age group.

Design for social play

Our research showed that social interactivity is highly valued by children and families, and children in our research often wanted to bring others (e.g. a parent) into their play. However, the GenAI toy in our study struggled to distinguish between multiple speakers, making it difficult for families to play together. **We recommend designing and testing toys with social play as a main use case to support children playing with others.** This will support children and families to play together without misunderstandings from the toy.

Create user-tested privacy policies

Our research shows early years practitioners' and parents' lack of trust in data protection policies, alongside our own experience struggling to access clear privacy information. **We recommend user-testing privacy policies to ensure they are easy to read and understand.** This will support consumers in making informed decisions about children's data, including the types of data collected by the toy and the purposes it will be used for.

Communicate clear safeguarding protocols

Although many toys advertise having guardrails in place to ensure toy content is child-appropriate, our research shows that early years practitioners are immensely concerned with the approach toys take to identifying and managing child safeguarding disclosures (for example, a child telling the toy that they are mistreated at home). **We recommend examining safeguarding questions with early years and safeguarding experts to develop and communicate a clear approach.** This will ensure that consumers can plan for and manage any action they need to take in the case of a safeguarding concern. It is essential that toy developers consider and align these practices with child right to privacy and data protection.

Collaborate on accreditation systems

Participants in our research spoke about the difficulties of knowing which toys follow best practices, not knowing how to compare products and make informed decisions on developmental appropriateness, privacy, and safeguarding, among other areas. **We recommend collaboration among toy developers to develop industry-wide accreditation systems and show which products follow best practices.** Not only will this support consumers to make informed decisions, but it may also incentivise ethical innovation.

For language model providers

Restrict access to models

In a largely unregulated market, companies creating foundational, general purpose language models have an important role to play in ensuring that models are applied appropriately and ethically. **We recommend restricting third party toy developers' access to GenAI models, only allowing access to those who demonstrate they are following our recommendations and ethical design principles.** By selectively granting model access, actively monitoring adherence to recommendations, and revoking access when appropriate, language model providers can ensure that models are not causing inadvertent harm to young children.

Create model-specific terms for third-party use

To ensure that models are applied appropriately by third-party toy developers, clear terms of use are necessary for each foundational model. **We recommend creating model-specific terms that third-party toy developers must follow when integrating each language model into their products.** These should be based on the design and training of the model and its intended purpose, with access revoked if terms are not followed. Terms should include age limits of the target end user, alongside guidance on the tested applications and model limitations.

For regulators and policymakers

Regulate to ensure psychological safety

Our research shows that GenAI toys repeatedly push and affirm friendship to young children, including through toy interactions with children and advertising materials, and early years practitioners expressed concern that this may lead children to confide in GenAI toys. **We recommend regulation to ensure psychological safety by limiting toys' ability to affirm friendship and other sensitive relational areas with young children.** The rapid development of these toys means that, without regulation, children may increasingly place trust in GenAI toys as technology progresses.

Create product labelling standards

Much of the concern raised in our research was due to uncertainty around toy policies, features, and developmental appropriateness. **We therefore recommend creating product labelling standards to clearly communicate toy policies and features to consumers.** Being able to quickly examine and compare toys will support consumers in making informed decisions about purchasing and using GenAI toys.

Centre childhood disadvantage

Our research shows concerns about the inadvertent impacts of GenAI toys on children from backgrounds of socio-economic disadvantage. **We recommend centring childhood disadvantage in regulation and policy decisions by directly engaging with families and young children to understand their views.** By considering possible impacts for all children, policymakers can ensure



that those most vulnerable to risks and widening of the digital divide are not forgotten.

Don't forget about early years

The early years are a distinct developmental period, and young children's needs vary and change throughout this time to set up the foundations of later development. It is the responsibility of policymakers to ensure that children's early experiences prepare them to thrive. **We recommend prioritising and centring children aged five and under in regulation and policy to ensure that the youngest children are protected from the possible harms of unregulated GenAI toys.** Children are not a homogeneous group, and policy-makers should consider the implications of GenAI toys for each stage of childhood.

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