Emotional artificial intelligence in children's toys and devices: Ethics, governance and practical remedies
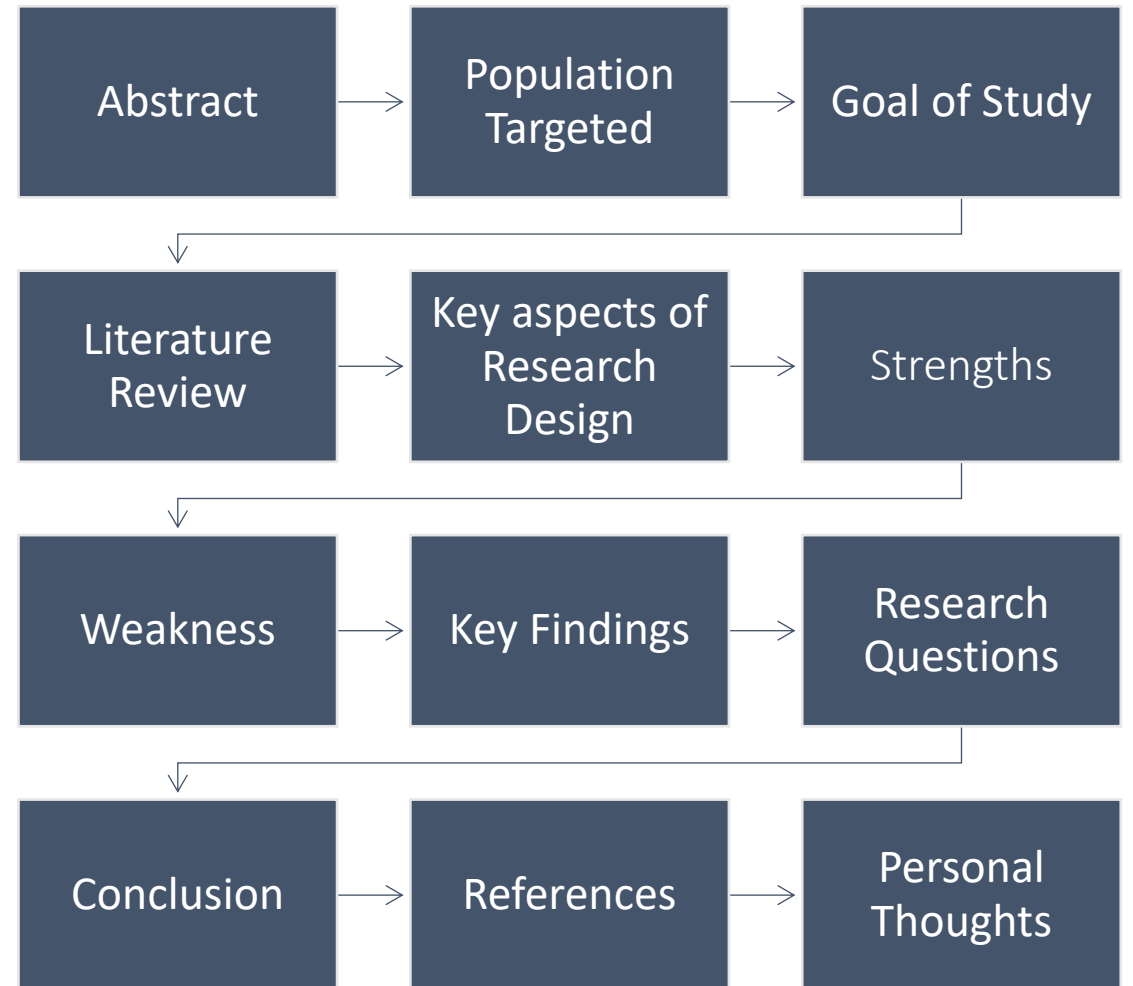
Presented by-SUCHARAN NARRA

G01348372

Authors

- Andrew McStay

-Bangor University: Bangor, Gwynedd

- Gilad Rosner

-London College of Communication: London

Contents

Abstract

- The article by Andrew McStay and Gilad Rosner discusses the social acceptability and governance of emotional artificial intelligence (emotional AI) in children's toys and devices. The authors conduct interviews with stakeholders and a UK national survey to understand parental perspectives on networked toys that utilize data about emotions. The article highlights concerns about generational unfairness, datafication of childhood, manipulation, parental vulnerability, synthetic personalities, media literacy, and governance. The authors conclude with practical recommendations for regulators and the toy industry.

Poputation Targeted

The population targeted in the above article are children who may use toys and devices with emotional AI, their parents or caregivers, and stakeholders with a professional interest in emotional AI, toys, children, and policy.

Goal of the Study

- The article discusses the potential impacts of emotional AI and related technology on children. It raises concerns about the conversion of child behaviour and subjectivity into biocapital, as well as the historical and contemporary development of toys and wearables that track emotion. The article argues that the emotional and affective context of parenting increasingly overlaps with the datafication of parenting, and that the emergence of smart and connected toys raises security concerns and apprehension of deception in child relationships with AI systems. The article concludes that further research is needed to better understand the potential impacts of these technologies on children's emotional development and well-being.

Literature Review

- The emergence of Emotional AI, which involves using artificial intelligence and affective computing techniques to sense, learn about, and interact with human emotions. The article focuses on the concerns raised by applying Emotional AI to children, including the conversion of child behavior and subjectivity into biocapital and the increasing overlap between datafication and parenting. The review also explores the history of toys with roboqualities, including dolls and interactive toys, and concludes by highlighting the emergence of home social robots with social qualities, learning abilities, and moods of their own.

Literature Review

- References: Chaudron, S., Di Gioia, R., & Gemo, M. (2019). The state of the art of connected toys: a comprehensive review. Computers in Human Behavior, 100, 50-63.

- Grimes, S. M. (2015). The disconnection of smart toys. Interaction Design and Architecture(s), 25, 88-96.

- Holloway, D., & Green, L. (2016). The internet of toys: a post-physical perspective on playful communication and identity. Convergence: The International Journal of Research into New Media Technologies, 22(3), 257-271.

- Jones, C., & Meurer, J. (2016). Techno-kids: Children's everyday relationships with media technologies. Springer.

- Lupton, D., & Williamson, B. (2017). The datafication of primary and early childhood education: playing with numbers. Taylor & Francis.

Key aspects of Research Design

- 1. Methodology: The authors conducted 13 in-depth interviews and a demographically representative UK national survey of parental attitudes to emotional AI in child-focused technologies to uncover legal, child development, privacy, and consumer-related issues for further consideration. The interviews were conducted between August 2019 and May 2020, with an average interview length of an hour. The interviews were designed to solicit opinion and insight from individuals across industry, academic, policy, health, and civil society groups in the UK and USA with expertise on emotional AI, data ethics regarding children's emotions, relevant legal issues, and the toy industry.

Key aspects of Research Design

- Thematic analysis: The authors used a hand-coded approach to analyze the interview data, balancing deductive theory with inductive insights from the data. The practicalities of coding were done by annotating sentences and paragraphs of deductive interest (from the literature review and author understanding of the field) and inductive interest (other insights relevant to the research aims of this project that were not foreseen). After developing codes, these were abstracted into categories and then into broader themes. Both authors undertook this process, reached similar conclusions, and then debated and agreed four key themes.

Key aspects of Research Design

- Research limitations: The authors note that the low number of interviewees and sensitivity to the context of the interviews, voice and behavior cues, and other contextual factors that might have been missed by an automated approach made a hand-coded approach to thematic analysis preferable to a software-led approach. The authors also note that the views of the interviewees should not be taken as representative of their organizations.

Strengths

- The study used an adaptive approach to analyze the interview data, which balances deductive theory with inductive insights from data, leading to a more nuanced understanding of the issues.

- A hand-coded approach was employed to analyze the interview data, which is more sensitive to the context of the interviews, voice and behavior cues, and other contextual factors that might have been missed by an automated approach.

- · The survey was conducted online via a commercial survey organization, which generated a respectable weighted sample of hard-to-reach participants.

Weakness

- The study only used a sample of 13 interviews, which might not be representative of the larger population of parents and their attitudes towards emotoys and emotional AI.

- The study was conducted in the UK, which limits the generalizability of the findings to other cultural and geographical contexts.

- Online surveys are imperfect, involving difficulty in presenting complex topics, inter-subjectivity, and minimal control over whether respondents are engaged or distracted.

Key findings

The interviews generated four key themes:

- (1) generational unfairness
- (2) susceptibility of parents.
- (3) guarded interest
- (4) need for good governance

1)generational unfairness

- Generational unfairness is a principle that children have little control over the datafication of their childhood years.

- · Data about emotions represents an increase in this logic, introducing new concerns and questions.

- · Adults are collecting and processing children's data without always thinking about future impacts.

- · Emotional AI amplifies informational asymmetry due to child inability to challenge embedded framings of emotion in technology.

- · Unfairness concerns include manipulation by companies that do not have child wellbeing foremost in mind, economic value of data about emotion, and power differentials.

- · Concerns about the right to have parts of childhood forgotten due to data longevity.

2) susceptibility of parents.

- Parents' data illiteracy and emotional susceptibility can be exploited by novel biometric and AI-based technologies and can impact children in multiple ways.

- · Parents' emotional susceptibility and fear of failure can lead them to make irrational decisions regarding privacy and data protection.

- · The susceptibility of parents through desperation can result in unethical business opportunities by the tech industry.

- · Emotion-sensing is seen as methodologically problematic by interviewees with and without technical expertise.

- · Face-based basic emotion systems can be problematic for children due to their lack of contextual awareness and immaturity.

- · Machine learning in emotional AI may discover a signal in data that is stipulated by a system that seeks to stimulate an emotion.

3) guarded interest

- The study found that no interviewee expressed unreserved support for toys related to sensing emotions, but some expressed guarded interest.

- · Interest in these toys was focused on child health, wellbeing, safety, and creativity.

- · Livingstone believes that there needs to be a debate on the benefits and potential harm of these toys, and who is benefitting from the data collected.

- · Golin is skeptical about who benefits from these toys, but acknowledges that they could be positive if they allow children to exercise their creativity.

- · Pavliscak, who has a background in technology design, is skeptical of the idea of creativity in emotoys and believes that adult toymakers misunderstand the nature of child play.

- · Lievens, a child law expert and smart toy researcher, is less negative about smart and emotoys and sees potential for positive uses, particularly for sick children in hospitals.

- · Vance sees potential benefits in using conversational toys to help children self-regulate their emotions, but acknowledges the need for privacy and parental consent.

- · Milkaite and Verdoodt emphasize that emotoys should be designed in the best interest of the child and with restrictions on the use and commercialization of data collected.

4)Need for good governance

- European legal experts emphasized the need for good governance in the development of emotoys, aligned with the Council of Europe's recognition of the potential harm and promotion of healthy access to the digital environment.

- · Children's right to participate in the digital environment and be heard during the development of IoT toys were emphasized, and the GDPR was seen as having potential for children's protection if guided by the European Data Protection Board.

- · The absence of emotion in the GDPR and ePrivacy regulation was noted, with concerns raised over consent, the boundaries between necessary processing and consent, and extra-territoriality, given the international nature of the emotoys market.

- · Special legal provisions for emotion data were not seen as necessary by interviewees from a legal background, although greater regulatory clarity and enforcement were needed to ensure data protection and privacy rights.

- · Consent was seen as the only legal basis for processing emotional data, and concerns were raised over whether it could be freely given, given the complexity of privacy notices and the integration of emotional AI into services.

Research Question

- **Q1 asks: 'How comfortable are you with the idea of Internet-connected toys for children that process data about a child's emotions?'**

- Based on the given information, it seems that parents were not given a detailed description of the technology but were asked to consider the principle of internet-connected toys for children that process data about a child's emotions. The study aimed to investigate parental comfort levels with such technology, particularly in terms of creepiness, parental alarm, and comfort with new technology.

- The results of the study suggest that parents display neither high comfort nor very low comfort, with 48% overall registering as 'uncomfortable' and 30% overall as 'comfortable.' This indicates that while parents are not comfortable with the idea of these technologies for various reasons, parental alarm was not the leading sentiment.

- It would be interesting to know what specific reasons parents cited for their discomfort with the technology, as well as what factors influenced the comfort levels of those who expressed comfort with the idea of emotoys. Additionally, it would be useful to investigate whether there were any demographic or socio-economic factors that influenced parental comfort levels.

Research Question

- **Q2: How comfortable would you feel giving your child an internet-connected wristwatch or wearable device that reports insights on their emotional state back to you, such as whether they are happy, stressed, angry or sad? The device would provide both daily information and a longer-term record of their emotional state over a period of time.**

- The majority of respondents (43%) registered as 'fairly comfortable' with the idea of internet-connected toys for children that process data about a child's emotions. However, the second highest response was 'fairly uncomfortable' at 25%, and the percentage of respondents who registered as 'uncomfortable' was only slightly lower than those who were 'comfortable'. The lack of polarization in responses is notable. The article also notes that women may be more comfortable with tracking technologies and self-monitoring due to familiarity with personal biometric technologies.

Conclusion

- The article explores the use of Emotional AI, which involves using affective computing and artificial intelligence to sense, learn about, and interact with human emotions. The article uses expert interviews and a national survey of parents to investigate the ethical, governance, and data protection issues related to this technology. The expert interviews highlight concerns about generational unfairness, power imbalances, and manipulation of child vulnerability, while also acknowledging the potential benefits of these technologies for child wellbeing. The survey results reveal ambivalent responses from parents, who are concerned about privacy but also see the potential benefits of emotion-enabled devices. The article recommends close regulatory attention to these technologies, on-box notification for emotoys, and the development of age-appropriate communications strategies to enhance data literacy regarding these toys.

References

- References Acquisti A and Grossklags J (2005) Economics of information security privacy and rationality in individual decision making. IEEE Security & Privacy, January. Available at: https://dl.acm.org/doi/10.1109/MSP.2005.22 (accessed 19 January 2021).

- Azari B, Westlin C, Satpute AB, et al. (2020) Comparing supervised and unsupervised approaches to emotion categorization in the human brain, body, and subjective experience. Scientific Reports 10(20284): 1–17.

- Barassi V (2020) Child Data Citizen: How Tech Companies Are Profiling Us from before Birth. Cambridge, MA: MIT Press.

References

- Barrett LF, Adolphs R, Marsella S, et al. (2019) Emotional expressions reconsidered: Challenges to inferring emotion from human facial movements. Psychological Science in the Public Interest: A Journal of the American Psychological Society 20(1): 1–68.

- Blum-Ross A and Livingstone S (2017) Sharenting: Parent blogging and the boundaries of the digital self. Popular Communication 15(2): 110–125.

- Brito R, Dias P and Oliveira G (2019) The domestication of smart toys: Perceptions and practices of young children and their parents. In: Mascheroni GG and Holloway D (eds) The Internet of Toys: Practices, Affordances and the Political Economy of Children's Smart Play. London: Palgrave MacMillan, pp. 111–133.

Personal Thoughts

There are benefits and risks of using Emotional AI in child-focused objects such as toys and wearables. There should emphasize the need for ethical governance, privacy protection, and better data literacy for parents and children. I also think that better enforcement of existing laws and regulations is needed, along with on-box notifications and age-appropriate communication strategies to enhance child and parental data literacy. Overall, there is need for close regulatory attention to Emotional AI and its potential impact on children's emotional development.

Thank You