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PARENTAL MEDIATION STRATEGIES IN THE AGE OF ARTIFICIAL INTELLIGENCE

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Abstract

Parental mediation explains the intervention of parents in children's media use with the motive of minimising risks and maximising benefits associated with the use. Over the years, parental mediation research has focused on children's use of traditional and digital media such as television, video games, social media, smartphones, internet, etc. The research shows that parents use a number of approaches such as active, restrictive, co-use, active co-use, interaction restrictions, technical restrictions, and monitoring in mediating children's use of these media. The emergence of Artificial Intelligence (AI) has presented a more complex technology consumption experience, especially with the children. It is said to be the single most influential technology on the future of today's children. Children's experience with AI is largely characterized by para-social relationship between them and non-human characters. The para-social relationship is in the form of attachment, character personification, and social realism. This relationship has presented both risks and opportunities more than seen in children's experience with non AI technologies, thereby raising the pertinent question: Are the existing parental mediation approaches still relevant in mediating children's use of AI technologies? This paper, a library research, attempts an answer to this question. It identifies children's experiences with AI technologies, pointing out the opportunities and risks associated with the experiences. It goes on to examine the existing and emerging parental mediation strategies and analyses their relevance in mediating children's use of AI technologies. On this basis, the paper proposes relevant parental mediation strategies for children's use of AI technologies. The proposed strategies include active, restrictive, co-use, participatory learning, active co-use, interaction restrictions, technical mediation, monitoring, balancing mediation, ad hoc mediation, permissive mediation, authoritarian surveillance, non-intrusive inspection, and AI-based tools, as an extension of technical mediation. It is suggested that future research should test these strategies empirically to ascertain their effectiveness.

Key words: Artificial Intelligence, AI Technologies, Children, Media, Parental Mediation

Introduction

One technological development that has had tremendous effect on mankind in the 21st century is Artificial Intelligence (AI). The advent of the technology, arguably, is traced to 1956 in a conference popularly called the "Dartmouth Workshop." The onerous task of that conference was to answer the question whether it was possible to create machines that could mimic human beings. Participants at that conference who included John McCarthy (regarded as the father of AI) agreed it was

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possible and coined the term AI (Arias, 2022). It has to be noted that before the Dartmouth Workshop efforts were made by professionals in different fields notably philosophy and mathematics to invent machines that could work like human beings (Warwick, 2012).

What is AI? A variety of definitions of AI abound from the perspective of scholars from different disciplines like computer science, computer engineering, philosophy, psychology, mathematics/statistics, neuroscience, linguistic and biology, etc. The common denominator from the multidisciplinary definitions is that AI is a field of science which converge different disciplines with the objective of creating systems with the ability to learn, understand and process natural language, perceive, carry out automation, reason logically, adapt, ingest data, solve problems, represent knowledge, plan, process symbols, and predict (Arias, 2022; Watanabe, 2023). AI represents computer systems that are designed to perform tasks that require human intelligence. The systems sometimes perform these takes better and faster than humans (Press, 2024; Waller, 2023).

The AI technology is applied in a wide range of industries including the communication and media industry with the motive of increasing efficiency, productivity and accuracy. In the communication and media industry, AI is applied in a number of media genres notably in music, film, television, journalism, advertising, video games, and social media/new media. The entertainment media industry is one area that has been saturated with the application of AI largely for content creation. As noted by Matuszewska (2024), companies in the media entertainment industry often leverage AI-based tools that aid in digital acceleration by creating recommendation systems, speeding up content creation, developing custom AI chatbots, audience analysis, and content moderation – especially in social media.

AI has presented a more complex technology consumption experience, especially with the children. It is said to be the single most influential technology on the future of today's children (Ali *et al.*, 2021). Children's experience with AI is largely characterized by para-social relationship between them and non-human characters. The para-social relationship is in the form of attachment, character personification, and social realism (Boston Children's Digital Wellness Lab, 2023). Children's experience with AI is associated with both risks and opportunities. How do children mitigate the risks and maximize the opportunities presented by AI? Finding answers to this question is the onerous task of this paper.

One intervention approach that has proved fruitful in children's encounter with the media is parental mediation, which is understood as parents' intervention in children's media use with the motive of minimising risks and maximising benefits associated with the use. Parents use a number of approaches such as active, restrictive, co-use, active co-use, interaction restrictions, technical restrictions, and monitoring in mediating children's use of these media. Over the years, parental mediation has focused on children's use of traditional and digital media such as television, video games, social media, smartphones, internet, etc. The emergence of AI has presented a more complex technology consumption experience among children. This experience is characterized by risks and benefits more than the case with non-AI driven media consumption. The question therefore arises: Are the existing parental mediation approaches still relevant in mediating children's use of AI technologies? Providing answer to this question is part of the thrust of this paper.

The objectives of the paper, a library research, are to (1) examine existing parental mediation strategies with a view to identifying their relevance in the age of artificial intelligence, (2) identify parental mediation strategies within the technology of artificial intelligence, and (3) propose comprehensive parental mediation strategies for the age of artificial intelligence. In an attempt to realize the objectives, the paper is structured along the following sub-heads: Children's uses of Artificial Intelligence-driven media, opportunities and risks in children's experience with Artificial Intelligence, proposed parental mediation strategies in the age of artificial intelligence, conclusion and recommendations, and suggestions for further research.

Children's Uses of Artificial Intelligence-Driven Media

Given that AI is a recent phenomenon, research is yet to be clear specifically on children's use of AI. What is however clear is that children

interact and use artificial intelligence every single day as they engage with electronic devices. This is because almost all electronic devices children use are considered smart or at least connect to an artificially intelligent source (Thacker, 2018). It is worthy to note that children are beginning to be creators, thinkers and citizens in the fast AI-driven society (Ali *et al.*, 2021). A number of media children use have started using AI tools in content creation and sharing. This is the case with social media, video game apps, educational apps, and websites. One aspect of AI that has attracted the attention of children to a very large extent is generative AI, which is defined as a type of artificial intelligence that is capable of producing various types of content, including text, imagery, audio, and other media as well as synthetic data (Lawton, 2024).

A large number of children have made use of some of generative AI applications. For example, research by OFCOM (2023a) shows that 79 percent of online teenagers and 40 percent of children aged 7-12 years have used ChatGPT, Snapchat My AI, Midjourney or DALLE-E in 2023 in the United Kingdom. Other statistics provided by Ofcom (2023a) indicate that children use generative AI for the following reasons: Chatting/explaining the technology (48%), finding information and content (36%), seeking advice (22%), creating new text (20%), creating image (20%), summarizing existing text (14%), coding (11%), creating video (9%), and creating audio output like music (4%).

Apart from directly making use of generative AI applications, children's general media use is fascinating. Note that generative AI is applied to a high measure in content creation in contemporary media productions (Gupta & Srivastava, 2023). OFCOM (2023b) report on children's media use reveals that children's viewing of broadcast TV has declined (20%) and their viewing of video on online sharing platforms like YouTube and TikTok has appreciated (96%). Their use of social media applications is also high (YouTube, 88%; WhatsApp, 55%; TikTok, 53%; Snapchat, 46%; Instagram, 41%; Facebook, 34%) just as their involvement with video games (89%). American College of Pediatricians (2020) report that four out of every ten children use cell phones and as many as 88.2 percent use screen media including mobile devices. Adigwu and Watt (2020) have also observed that digital media use among children is high. Further statistics on children's media use reveal that 67 percent of children 12-17 years use social media, 14 percent of children 3-4 years are owners of media devices such as tablets or game console, and 58 percent of children 8-12 years are owners of social media accounts or profile (Lindner, 2023).

Children's use of media is not passive. A study by Merdin and Sahin (2023) found that toddlers, pre-schoolars and infants do not passively use media chosen by other family members; they are able to on their own turn on the TV (58.5%), change TV channels (57.3%), turn on the computers (30.6%), turn on tablet and/or smartphone (59.7%), open video games on the computer (25%), open video games on tablet and/or smartphone (51.5%), install programmes on the computer (7.5%), and install programmes on tablet and/or smartphones (17.5%). What this finding suggests is that AI-driven media content may have some level of benefits and risks for children.

Opportunities and Risks in Children's Experience with Artificial Intelligence

Children's encounter with AI is a mixed bag of opportunities and risks, depending on how the children are guided to use the technology. In terms of opportunities, UNICEF (2018) has identified four thematic areas of AI benefits to children: (1) The power of adaptable AI: the power of AI in helping children adapt to their needs, context, preferences and priorities. (2) Big data insights: the power of AI tools to generate enormous amount of data that can assist children in a number of areas including agriculture, health, urban planning, etc. (3) Cognitive support: AI supplements the innate intelligence and abilities of children which allows them to access information faster and discharge personal and professional roles more efficiently. (4) Enabling accessibility: Intelligent systems, an aspect of AI, like virtual assistants, robotic devices, smart applications, etc have the ability to offer physical, emotional and sensory support to children and also adults who have different abilities.

Child education is a priority for most parents and the society at large. AI has great promises in enhancing child education. National Parents Union and Centre for Policy and Action (2024)

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have noted that AI tools can assist children write essays, receive tutorials, and get initial feedback on homework before turning it in. AI has the tendency to contribute to children's education in so many other ways especially in the areas of personalized learning, adaptive learning, engagement and interactive learning, automated feedback and assignment, accessibility and support, early identification of learning difficulties, support for language learning, support for children with disabilities, fostering creativity and critical thinking, encouraging collaboration and communication, building self confidence and motivation, efficient learning management, data driven insights for educators, supporting teachers in the classroom and preparing children for the future (Kenility, 2024).

On the other hand, there are also a number of risks associated with children's encounter with AI. Howley (2019) has noted that children's interaction with AI devices has the tendency to alter children's perception of their own intelligence, cognitive development and social behaviour. Howley observes further that the technology intrudes on children's privacy (data privacy and ethics privacy); Internet of toys, an aspect of generative AI raises privacy and security concerns for children. Indeed, the data footprints of children are growing at an alarming rate. Kurian (2023) has observed that conversational AI misrepresents empathy in children because the limits of the technology to emotion recognition and language processing and algorithmic bias.

UNICEF (2018) is worried that AI has adverse consequence on children in the areas of privacy, safety and security (increase in levels of unprotected identity, harmful content, location detection and biological insecurity), and lack of or inadequate inclusion and equitability to services in education, health, employment, social/welfare services, urban services, and credit/financial services for families, which affects children, etc. A systematic literature review undertaken by Karan and Angadi (2023) identified the following risks associated with the use of AI in education: Privacy and autonomy risks, AI biases, accuracy and functional risks, deepfakes and fate risks, social knowledge and skill building risks, and risk in shifting teacher's role. KPMG (2023) has observed that encounter with generative AI is generally associated risks bordering on data privacy, intellectual property, factual accuracy, discrimination, and liability. The technology could also be used in a malicious manner to spread misinformation, generate malware and target phishing scams. These risks can affect adults as well as children.

The prevalence of AI-generated child sexual abuse material (CSAM) has made it easier for scammers to create fake photos of children; the scammers no longer need real nude or explicit photo of children to exploit or threaten them into extorting money from them, complying with their demands or engaging in sexual acts with them. The scammers can create fake photos of children from the ones available in school or social media (Knutson, 2023).

Many years ago, Livingstone and Haddon (2009) made a succinct classification of opportunities and risks associated with children's experience with online media. The classification in Table 1 below identified three types of opportunities and risks (contact, content, and conduct) with their associated examples as presented in Table 1. This classification, though was done before the advent of AI, still remains valid in the age of AI and with the AI technology. If any difference, the intensity of the opportunities and risks in the age of AI has increased (Yi *et al.*, 2024).

Parental Mediation in the Age of Artificial Intelligence – Proposed Strategies

Arising from the need to maximize the opportunities and minimize the risks associated with children's use of media generally and in the case of this research AI, there is a need for the adoption of parental mediation, defined by Kur (2021) as parents' adoption of diverse practices to manage and regulate children's experiences with the media so as to mitigate risks and maximise benefits associated with the use. Parental mediation describes the strategies parents adopt as an intervention measure in their children's media use (Lafton, *et al.*, 2024).

Among all the stakeholders in child development and technology use (family, school, religious organizations, the media, peer groups, child policy makers, industry players, etc), the family, particularly parents are best situated to intervene in children's technology use with the best result. This is as a result of their biological, physical, social, cognitive, motivational and emotional attachment to the

children (Mihalec-Adkins, 2020). As a result of this attachment, society expects parents to take good care of their children, and holds them responsible when the children are badly brought up and commends them when the children develop positively (Hussain & Anzar, 2019). Hence, parental mediation is a worthy intervention approach in children's experience with media technologies.

Previous research has identified a number of parental mediation strategies which include active (instructive) mediation, restrictive mediation, co-use mediation (Valkenberg, *et al.*, 1999), participatory learning (Clark, 2011), active co-use, interaction restrictions, technical restrictions, and monitoring (Livingstone & Helsper, 2008). Active mediation is parents' discussion of media content with children. Restrictive mediation is about setting rules that control children's use of the media in terms of time spent with the media, location of use, and content use. Co-use means the joint use of media by parents and children or the presence of parents when children use the media. Participatory learning is the interactions that go on between parents and children in relationship with the different forms of digital, mobile, and traditional media. Technical restrictions refers to the use of filters and monitoring software to keep track of children's internet-enabled media use, and monitoring is the practice of parents in constant inspection of children's use of internet-enabled media. A number of these strategies have been found to be effective in mediating children's use of both traditional and digital media as in the case of James and Kur (2020), Kur (2011), Kur *et al.* (2011), Kur and Essien (2014), Kur *et al.* (2019), Kur *et al.* (2019), and Kur *et al.* (2020) among several other researches on the subject matter of parental mediation around the world. How relevant are the foregoing parental mediation strategies in mediating children's media use in the age of artificial intelligence? Are there other parental mediation strategies specifically meant for the AI age? An attempt to provide answers to these questions is the focus of the rest of the discussion in this paper. The answer to the two questions is likely yes because some or all of the existing parental mediation strategies have been successfully used in the recent times in mediating children's use of AI-driven media as clearly shown by recent researches (Banić & Orehovački, 2024; Chen *et al., 2023;* Dedkova

Table 1: Classification of online opportunities and risks for children (Livingstone & Haddon, 2009)

	Contact: Child as recipient	Content: Child as participant	Conduct: Child as actor
OPPORTUNITIES			
Education, learning and literacy	Educational resources	Contact with others who share one's interests	Self-initiated or collaborative learning
Participation and civic engagement	Global information	Exchange among interest groups	Concrete forms of civic engagement
Creativity	Diversity of resources	Being invited/inspired to create or participate	User-generated content creation
Identity and social connection	Advice (personal/health/sexual, etc)	Social networking, shared experiences with others	Expression of identity
RISKS			
Commercial	Advertising, spam, sponsorship	Tracking/harvesting personal information	Gambling, illegal downloads, hacking
Aggressive	Violent/gruesome/hateful content	Being bullied, harassed or stalked	Bullying or harassing another
Sexual	Pornographic/harmful sexual content	Meeting strangers, being groomed	Creating/uploading pornographic material
Values	Racist, biased info/advice (e.g. drugs)	Self-harm, unwelcome persuasion	Providing advice e.g. suicide/pro-anorexia

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& Mýlek, 2022; Lafton, *et al.*, 2024). Lafton, *et al.* (2024), for example, found that active parental mediation strategy is effective in guiding children adopt digital skills (technical and operational skills, information navigation and processing skills, communication and interaction skills, and content creation and production skills), all of which are AI-driven.

Similarly, new parental mediation strategies have emerged to take care of the peculiar nature of technology in the digital age largely driven by AI tools. Nagy *et al.* (2023) investigated parental mediation strategies in the age of mobile technology, defined in the study as digital devices which in contemporary times employ AI tools. Findings identified four parental mediation strategies as balancing mediation strategy, ad hoc mediation strategy, permissive mediation strategy and restrictive media strategy. Of the four strategies, restrictive strategy is not new. But balancing, ad hoc and permissive mediation strategies appear to be new in the literature of parental mediation. Balancing mediation enable parents to follow and control their child's use of digital devices by sometimes reading their online messages in such a way that conflict does not arise. The strategy also involves discussion with children on their preferred way of using ICT in a normal fashion. In the ad hoc strategy, there is no discussion with children. Parents using this strategy usually have little or no spare time with their children and as such place some restrictions and occasionally disagree with their children. Permissive strategy is used often by parents who have trust that their children, usually older (14-15 years), will use technology responsibly. Thus, the parents do not adopt more of hands-on approach in mediating children's use of technology.

Internet in the present AI age is dominantly guided by AI tools and applications. Hence, findings of studies on parental mediation of children's internet use in the era of AI are pertinent to the foregoing discussion. Adigwu and Watt (2020) found that restrictive, active, participatory learning and technical mediation strategies are common in mediating internet use experience of children in Nigeria. Similarly, Li *et al.* (2022) found that monitoring, active, restrictive and technical mediation strategies are valuable in mediating children's internet addition. Sela (2023) found that technical mediation (Canopy's parental control application), active mediation and restrictive mediation strategies are essential in mediating problematic internet use among adolescents.

Other studies focus on children's use of social media, which is another media genre that features AI. Thus, a study by Ho *et al.* (2019) found that active mediation, restrictive mediation, authoritarian surveillance and non-intrusive inspection are veritable mediation strategies. Authoritarian surveillance and non-intrusive inspection are new strategies found to be unique in mediating children's social media use largely as a result of social media unique features of personal accounts, one-to-one messaging and user profiles. **Corpuz *et al.* (2022) found that restrictive and active mediation are the two most common strategies used in mediating children's experience with social media in the Philippines.** Mekonen *et al.* (2024) found that the most effective parental mediation strategies in mediating secondary school students' social media use in Ethiopia are arranging and limiting time mediation, selecting content mediation and co-view mediation. Both arranging and limiting time mediation and selecting content media mediation are aspects of restrictive mediation. Chen and Liu (2024) found in China that active, restrictive and non-intrusive inspection mediation are the dominant strategies used in mediating children's encounter with social media.

Artificial intelligence could also constitute a parental mediation strategy in the age of AI. In their study, Glassman *et al.* (2021) found that AI-based coaching tools can be designed to help reduce threats from parenting technoference (the use of mobile technologies by parents during parent-child interaction) in children. Glassman *et al.* (2021) noted that this finding is consistent with earlier observation that AI- non-invasive visual and audio monitoring tools could be trained for parents to use in monitoring and nurturing valuable behaviour in children. This strategy is an extension of technical parental mediation earlier discussed. Thus, the AI technology can be used to improve technical mediation.

In support of the foregoing, literature on digital parenting suggests that AI can assist parents create a safer and more balanced digital environment for their children using AI-powered content moderation tool, adaptive

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learning and personalised screen time management tool, early detection of cyberbullying and online predators tool, and healthy habits and building digital resilience tool (Otermans Institute, 2024). Similarly, AI tools called AI GPTs for Parental Mediation exists for parents, educators, and child welfare professionals who seek to integrate technology into their intervention of children's technology use. The tools perform a wide range of functions from basic parental guidance to complex content monitoring. Their special features include language learning support, tailored educational content creation, technical assistance for safe web browsing, image filtering, and sophisticated data analysis to understand children's online behaviour (Yeschat AI, 2024).

Conclusion and Recommendations

The paper has attempted to identify parental media strategies for effective mediation of children's experience with media technologies in the age of AI. In doing this, the paper observes pertinently that children in the digital age are extensively making use of generative AI tools and applications and AI-driven media technologies. The use has both benefits and risks for the children. The benefits are in the areas of education, learning, literacy, participation and civic engagement, creativity, identity and social connection. The risks border on commercial, aggressive, sexual and value disorientation of the children. In both the benefits and risks, the children are affected as recipients, participants and actors in the AI technologies.

It is clear from the discussion that existing parental mediation strategies that have been used in mediating children's use of traditional media (active, restrictive, co-use, participatory learning, active co-use, interaction restrictions, technical mediation and monitoring), new ones that have been used in mediating children's media technologies use in the digital era (balancing mediation, ad hoc mediation, permissive mediation, authoritarian surveillance, and non-intrusive inspection) and AI-based tools, as an extension of technical mediation, are pivotal in mediating children's experience with AI tools and applications and AI-driven media technologies.

Arising from this conclusion, it is recommended that parents desirous of assisting their children cultivate productive and safe use habits of AI-driven media technologies should consider an ad-mixture of existing parental mediation strategies as well as AI-based tools and applications designed for the purpose of parental mediation. The effectiveness of parental mediation strategies is dependent on child, media used by the child and parental factors (Kur *et al.*, 2019). Therefore, in adopting any mediation strategy parents should consider child factors like age, sex, peer influence, political inclination, emotions, pattern of new media use, etc, media factors like audible media, visual media, print media, mobile media, multimedia, AI media, etc, and parent factors like age, sex, SES, engagement with children, political interest and affiliation, perceptions and use of AI-driven media, etc.

Considering the important place of emerging technical mediation, especially the AI-driven aspect, it is imperative for parents to acquire relevant digital technological literacy (especially AI literacy) and skills in manipulating the technology. Children, especially the older ones, as digital natives, have enough of the literacy and skills. Parents also need to acquire the corresponding literacy and skills to enable them use technology to mediate children's use of AI technology and AI-driven media technologies.

Suggestions for Further Research

Data used in arriving at the conclusion in this paper is secondary data based on library research. Hence, there is need to test empirically the assumptions suggested by the conclusion in this paper; each of the proposed mediation strategies for the AI age should be subjected to empirical examination using strong methodological approaches like experiment, media diaries, focus group discussions, surveys that consider the perspectives of both parents and children, and triangulation. The empirical examination should focus on specific factors (child, AI-driven media and parents) in consideration of effective parental mediation strategies. In this way, data collected will clearly reveal the suitability and effectiveness of any parental mediation strategy in the AI age.

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