Re-Imagining Digital Technology and Media As Care-Giving Assistant for Parents of Young Children

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1 INTRODUCTION

The ubiquity of digital technology is changing ways of modern parenting by creating new practices of its use [2, 6, 22]. Digital technologies are used by stressed families to achieve work life balance, avoiding conflict for maintaining peaceful family environment, and for educational opportunities for children [18]. Using digital devices to engage children is especially common in situations where parents have to work from home for extended periods of time, like in the recent event of a pandemic which became a global health concern [15, 21]. They are also used by parents of young children who live at a distance from their family and friends, and have limited access to childcare services. Children of such parents spend a lot of time indoors, with either or both parents looking after them [3]. These parents seek help from technology for engaging their children while they complete tasks in the absence of help, regardless of its associated drawbacks [10, 17]. Their choice of doing so lies in the lack of options available to them including affordable and reliable childcare [5], balancing time constraints [5] as well as their cultural, social and academic responsibilities [5]. In this paper, we call attention to the technology needs of such parents of young children by crafting parent personas and scenarios by incorporating a dyadic approach to persona design [1]. Our choice of using personas was motivated by their narrative structure and effectiveness, which makes it an ideal choice for putting forth the design space for care giving technologies for our intended user population. These personas are later situated in narrative scenarios to help designers and developers identify with users, putting their needs and requirements ahead of their own [12]. We conclude by discussing implications for practise of using digital technology as childcare assistant by this group of parents.

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2 METHOD

We utilized phase one through four of the dyadic caregiver-child persona design framework, which blends research from parental mediation theory with the design of personas, enabling persona design that portrays better description of the dynamics that exist within caregivers and children [1]. Our chosen age range of children was between 1-5 years, as children usually start kindergarten or first grade after this age [7], because of which one or both of the parent needs to be with them at home. Phase one of the framework calls for ways of aligning design objectives and data collection strategies considering caregiver-child dyad. Our design objective was to gather insights about parents' use of digital technology and media as a proxy childcare assistant in the absence of other caregiving help, and the limitations of parents experiences. During phase two (data collection strategy), first author transcribed casual conversations with parents to discuss their use of digital technology and media by and with their children, since the children in this age range were too small to respond to surveys or interview questions. In phase three, data was analysed with a focus on *populations and practices* rather than *people and products* [14] to extract common themes of childcare scenarios. The reason we chose the practice lens is because our intended user population practices childcare in ways which were usually unheard of by their ancestors, mainly because of the major shift in their lifestyles for accommodating studies and work. These practices may include *using digital media and screens to occupy child* [3], or *working from home* in the wake of the recent pandemic [15, 21]. For phase 4, we segmented and grouped the parent-child dyads based on their commonalities and patterns to create ad-hoc persona descriptions [13]. The personas were aimed at evoking empathy for our intended user population and inspiring design [12, 13]. Next, we created everyday scenarios to provide context by eliciting how these parents use digital technologies and interactive media to meet their childcare needs [14].

2.1 Parent personas

(1) *Ahmed* is pursuing PhD on scholarship, living with his wife and two year old daughter. His living stipend is barely enough to cover their basic living expenses, so his wife works at the local grocery store to make ends meet. Ahmed and his wife take turns to be at home with their daughter, as their financial state doesn't allow them to afford daycare or pay for a babysitter regularly. Being new immigrants, they do not have enough close friends or family living nearby to help them with their childcare duties.

(2) *Sara* is a stay-at-home mother of a 4 old, who lives away from relatives and friends as her family recently moved to a new city in the pursuit of her husband's better job. They live in a neighbourhood with student majority, hence her son barely gets to see any children around. Sara has bundle of chores during the day as a part of her cultural responsibilities as a mother and wife, while her husband spends major part of the day at work.

(3) *Andrea* is a single parent of a 3 year old girl, who moved to a different country for her job. Andrea used to previously rely on sending her daughter to the day-care center when she left for work. But due to the outbreak of pandemic COVID-19 [15, 21], she decided to pull her daughter out of the day-care. With several positive cases of disease in the community, Andrea does not want to risk hiring a baby-sitter, leaving her with no choice but to care for her daughter on his own at home.

2.2 Childcare scenarios

In this section, we describe the context of our developed personas to provide information about their environment and every day childcare needs in the form of scenarios [4].

Scenario 1: Ahmed reaches home from the lab to find his daughter playing in the toy room, and takes charge of looking after her as his wife leaves for her work shift. The nature of his wife's work requires her to be on duty on time, with minimal days off. With the end of semester fast approaching, Ahmed is stressed and needs extra time to work on the assignments from home. He hands the electronic tablet to the child to obtain undivided attention for the course assignment which is due the next day. About ten minutes into watching the TV, his daughter sees ice cream on the screen, resulting in a meltdown about having ice cream immediately. Ahmed barely makes it to the deadline while handling the emergent situations, since despite the variety of programs and shows, his daughter loses interest in a short while, coming to him every 15 minutes to seek his attention.

Scenario 2 Sara has to prepare lunch before her husband comes back from home, and also has a load of laundry waiting to be washed. She decides to sort the laundry and put in the washer, but her son clings to her legs, requiring double the time for every task. Sara prefers to engage her son at home by letting him video-call his cousins or friends, as it enables her to keep a close watch on him while having some time to work. As her son chats with his cousins, Sara is concerned about being pictured in the video-call any time without her knowledge, as she observes *parda* ('cover' that women are required to maintain according to Islam) [11].

Scenario 3: During the course of the day, Andrea tries to keep her daughter occupied with digital media devices while she completes her work and house chores. Since her daughter watches screen media for an extended period of time, Andrea desires the content that she watches to be educational as well as entertaining for her. She also wishes to know what her daughter watched during the day while she completed her work.

3 IMPLICATIONS FOR PRACTICE

The discussed scenarios highlight the need of having childcare services for young children which are cost-effective, safe and readily available, with the process of care-giving being engaging, educational and entertaining. In the following sections, we discuss some coveted design elements in a digital childcare solution implicated by the scenarios described above.

3.0.1 Seamless Engagement: Children are naturally liable to give up to their emotional states when faced with disruptions in the regular flow of events, resulting in tantrums [8]. Care-giving system should be able to maintain engagement while detecting child's attention away from the parent for them to be able to attend to their work. In case of a meltdown, the system should be capable of having backup strategies to seamlessly engage children so parents like *Ahmed* can continue working without interruptions.

3.0.2 Parent Involvement: Like *Andrea* and *Sara*, although the unavoidable circumstances of our intended group of users keep their direct attention away from their children for a longer time than usual, they want to be updated about their child's activities while they keep up with their work. A prominent feature of the system should be saving and summarizing the care-giving session for reporting to parents. Care-giving system can also suggest followup activities for the parents and children to be performed in their time together. It would not only answer parent's concerns about child's safety, but would also encourage parent involvement.

3.0.3 Affordability. One of the reasons of using digital technologies and media by our intended user group is its cost-effectiveness as compared to baby-sitters and daycare centers. Although the quality of care provided through

a digital care giving service is not comparable to other childcare services (baby sitter, nanny or day care), it can be relatively low-cost through the utilization of commonly available digital devices.

3.0.4   Edutainment: Some parents like *Andrea* want the care giving session to have some added value such as providing education or entertainment (or both) to the children, especially if it is for a longer period of time. The caregiver could propose different online activities with different level of active supervision, i.e. a story telling app could entertain and help vocabulary building a pre-school child while a drawing game could engage a 2 to 3 years old.

4   CONCLUSION AND WHAT'S NEXT

Although using digital technology and media as a care-giving assistant is assumed to be safer than letting the child go outside without supervision, it still has its shortcomings in terms of safety and privacy [9, 16, 19, 20]. In cases where the child is engaging in physically dangerous behaviour, the parents need to be immediately alerted by the system to get their attention. A record of the care giving session for parents to watch later can ensure both safety of children, and to provide feedback for keeping parents in the loop in an unobtrusive way. Credentials of child such as location and name need to be anonymous to the system to reduce the threats of exploitation in case of a data breach. Future research in this are can look into the type of activities and content that can be presented to children in this age group according to their attention span, physical and mental (dis)abilities and parent preferences with different levels of active supervision. Specific concerns for digital childcare for differently-abled children is also a notable future research prospect.

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