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The Home Literacy and Media Environment of Saudi Toddlers

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Keywords: toddlers, young children, screen time, screen media, digital literacy, reading, technology

Abstract

The past few years have witnessed a rapid increase in children's use of screen media. Despite the widespread use of technology in Saudi Arabia, research on screen media use among young children is scarce. The current study provides a comprehensive picture of screen media use and literacy practices among 220 1- to 3-year-olds in Saudi Arabia using an online survey. Findings showed that the vast majority of these children had started using screens before the age of 2 years. Saudi toddlers' overall screen time was about 3 hours a day which exceeds screen time recommendations by the World Health Organization. *Iftah Ya Simsim* (the Arabic version of *Sesame Street*) was children's favourite TV show, *YouTube* was their favourite mobile media app, and children's songs were their most frequently viewed content type on mobile media. The amount of time toddlers spent with screens was higher than their engagement with reading. More than 40% of the children were never read to, and one quarter had no children's books at home. Results of this study provide a better understanding of children's screen use and reading practices; an important first step in guiding the development of research-driven recommendations for all stakeholders on the use of screens by young children.

Keywords: toddlers, young children, screens, screen time, screen media, media use, digital media, literacy, reading, technology.

Research indicates that children's home literacy environments (HLE), particularly within the first few years of life, are robust predictors of early linguistic and cognitive

development (e.g., Liebeskind et al., 2014; Payne et al., 1994). Children's HLEs include a broad array of media, from screens to traditional books. Data on young children's screen media and reading practices is extremely important, but the vast majority of research on young children's HLEs and media use has focused on North America and Europe. This study contributes to the literature with data on the home media environments and media use patterns as well as data on reading-related practices of toddlers in Saudi Arabia. No prior data exists on this population, and thus this study broadens our global understanding of the HLEs of very young children.

Saudi Arabia as Research Setting

In Saudi Arabia, there is growing interest in technology's potential for early learning. However, there is no prior research on the screen media practices of young Saudi children, or on the impact of these practices on their development. Conducting research on young children is particularly important in Saudi Arabia, a demographically young country where almost 40% of its 32 million inhabitants are under the age of 20, and 10% are under age four, constituting the largest age group in the population (Saudi General Authority for Statistics, 2016). Saudi Arabia provides a good setting for this study, as the largest media market in the Middle East and North Africa (MENA) region, contributing to over one-third of the region's media market revenues (Dubai Press Club & Dubai Media City, 2016). In addition, given that Internet penetration in Saudi Arabia is 91% (Statista, 2020a), significantly higher than the global average of 59%, we presume that Saudi children are growing up in homes with robust, and as yet understudied, media environments (Statista, 2020b).

There are no prior studies on the use of screens among children under three in Saudi Arabia. Al-Agha et al. (2016) seems to be the only investigation that provided some data on screen media use among children in Saudi Arabia as they looked at the relationship between

screen time and body mass index among 541 2-18-year-olds by means of parent interviews. Results showed that the majority of the sample spent 2 hours or more watching television and 2 hours or more using electronic devices. However, because parents were only asked whether children spent more than or less than 2 hours a day using screens, the average amount of screen time was not provided. In addition, as the mean age of the children in the study was 10 years, it is not clear how many of the participants were in the crucial early years before 3.

In order to provide a better understanding of the home media environment of Saudi toddlers in the formative early years, we addressed the following questions:

RQ1. What are the key features of Saudi toddlers' media environments?

The key features of toddler's media environments include what devices they can access, age of first use, amount of screen time, and favorite content.

RQ2. How do screen media and reading-related practices among Saudi toddlers compare?

RQ3. How do Saudi toddlers' screen media and reading-related practices vary socio-demographically?

Method

Participants

This study includes 220 primary caregivers of children between 1 and 3, residing in Saudi Arabia. Caregivers were recruited via several social media platforms and invited to complete an anonymous online survey via an embedded URL. Among the 422 respondents who completed it, 202 were eliminated for one or more of the following reasons: (a) the child was younger than 1 year or older than 3 years ($n = 134$), (b) the child was not a resident of

Saudi Arabia ($n = 31$), or (c) the child had health or developmental issues that may interfere with their media environment ($n = 37$).

The mean age of the children (female $n = 107$; male $n = 113$) was 25.34 months ($SD = 6.73$) with 21% being firstborn. The vast majority of the respondents in the study were the children's mothers (99%), Table 1 provides details of the sample characteristics. No benchmark data exist against which to compare the demographics of this sample.

[Insert Table 1 here]

Procedure

Participation in the study was voluntary and the study was approved by University of Manchester's Ethics Review Board.

Survey

The online survey was in Arabic and took approximately fifteen minutes to complete; it included 72 items about children's environment and media use. In order to ensure content validity, we reviewed relevant previous research and instruments (e.g., Rideout, 2013; Wartella et al., 2014), and we generated a list of survey items that aimed to measure the constructs of interest.

Nine of the items to measure the child's media use were adapted from the Common Sense Media (CSM) Zero to Eight Survey (Rideout, 2013). Items adapted from CSM included asking about the number of media devices in the household, the number of media devices in child's bedroom, media devices owned by the child, how often child viewed certain media content types, and how often child and parents engaged in reading and media use activities. The remainder of the survey items were developed by the first author. For

example, we asked parents to report at which age their child started watching TV, at which age the child started using mobile media devices, how many hours in a typical day the child spends watching TV, and how many hours in a typical day the child uses mobile media devices. It should be noted that any viewing of contents on a mobile media device is considered a mobile media use. This includes watching TV shows or reading e-books on mobile media devices.

Analysis

Statistical analysis was performed using the R statistical package (version 3.4.2). When investigating the onset age of screen use and the amount of screen time, we divided the children into two age groups: a younger group aged 12-23 months ($n = 86$, $M = 18.12$ months, $SD = 3.40$ months) and an older group aged 24-36 months ($n = 134$, $M = 29.98$ months, $SD = 3.43$ months). This division was based on international guidelines on screen time that make a distinction between screen time recommendations for children above and below 2 years (e.g., American Academy of Pediatrics, 2016; World Health Organization, 2019).

We then examined whether demographic differences predicted differences in screen media and reading practices (i.e., child age, parental education, and household income) via randomised tests with 4,999 runs instead of multivariate analyses of variance (MANOVAs), as the normality assumption of the MANOVA was not met for at least one of the categories of the sociodemographic variables using Shapiro-Wilk test of normality ($p < .05$). Then, in the presence of significant differences, Student's t-test or two-sample Welch's t-test for unequal variances were performed for demographics with two categories (i.e., child age), while one-way analysis of variance (ANOVA) or alternatively Kruskal-Wallis tests were used for demographics with more than two categories (i.e., parental education and household

income). To reduce Type 1 error, we applied Bonferroni corrections to adjust for multiple comparisons by dividing the significance level $\alpha = .05$ by the number of tests conducted ($.05/4 = .0125$). To test the significance of differences in the categorical demographic variables, we used the chi-square test for equality of proportions at significance level $\alpha = .05$.

Results

The goal of this study was to establish what Saudi toddler's media ecologies look like, and the nature of their media and reading activities within those home environments. The results are organised according to the research questions that were presented earlier.

RQ1. What Are the Key Features of Saudi Toddlers' Media Environments?

Access to Screen Media

Table 2 shows the availability of screen media in the households of Saudi toddlers in this sample.

[Insert Table 2 here]

Age of First Screen Media Use

Among children who watched television ($n = 212$), the median age for first viewing was 12 months ($M = 14.19$ months; $SD = 6.92$). Among those whose parents reported mobile media use ($n = 198$), the median age was 18 months ($M = 18.77$ months; $SD = 7.58$).

Caregivers of children aged 1-2 years reported significantly earlier initial television viewing, $t(184.06) = -2.91, p = .004$, and earlier initial mobile media use, $t(196) = -4.72, p < .001$, than caregivers of children aged 2-3 years.

Amount of Screen Time

Caregivers were asked to report the number of hours or minutes in a typical day their child spends watching television as well as the number of hours or minutes in a typical day their child spends using mobile media devices. Overall screen time was calculated for all children in the sample including those who never used screens. The mean overall screen time for 1- to 3-year-olds was approximately 3 hours per day ($Mdn = 180$ minutes, $M = 194.1$ minutes, $SD = 154.70$ minutes). There was no statistically significant difference in screen time between the two age groups, $t(217) = -1.43$, $p = .154$.

The mean television time for 1- to 3-year-olds was about 2 hours per day ($Mdn = 120.00$ minutes, $M = 125.30$ minutes, $SD = 111.24$ minutes). No significant difference was observed as a function of age group (younger age group: $M = 125.12$ minutes, $SD = 113.69$ minutes; older age group: $M = 125.37$ minutes, $SD = 110.10$ minutes; $t(217) = -0.02$, $p = .987$).

The mean mobile media time for 1- to 3-year-olds was about 1 hour per day ($Mdn = 60.00$ minutes, $M = 69.07$ minutes, $SD = 83.28$ minutes). A significant difference was observed as a function of age group (younger age group: $M = 51.05$ minutes, $SD = 75.83$ minutes; older age group: $M = 80.63$ minutes, $SD = 86.02$ minutes; $t(218) = -2.61$, $p = .010$).

Favourite TV Shows and Mobile Media Apps

The three most favourite shows for Saudi toddlers were *Iftah Ya Simsim* (the Arabic version of the American children's TV series *Sesame Street*; 11%), Arabic nursery rhymes and children's songs (which are usually viewed on dedicated children's song channels such as *Toyor Al-Jannah* and *Karameesh*; 11%), and *Fi Hadeeqat Almarah* (an Arabic dubbed version of the BBC children's TV series *In the Night Garden*; 10%).

YouTube was the most favourite app among Saudi toddlers. Thirty-seven percent of caregivers named *YouTube* among their children's most favourite apps, followed by *Lamsa* (15%), an edutainment app with interactive games and digital storybooks. The third most popular app was *Adnan the Quran Teacher* (13%), an app that aims to help children recite and memorise the holy book of Islam.

Most Frequently Viewed Mobile Media Content Types

Table 3 shows how often children used specific types of apps on a smartphone or tablet. Apps and programmes that have video songs were the most frequently viewed type of mobile media content as about 43% of the caregivers reported that their children “always” or “often” use them. Children who were 2 years or above used educational apps on mobile media devices significantly more than younger children, $X^2(1, N = 220) = 4.60, p = .032$.

[Insert Table 3 here]

Screen Media and Reading-Related Practices Among Saudi Toddlers

When asked about the number of children's print books available at home, including books shared with siblings, caregivers' responses indicated that more than a quarter (26%) of Saudi households with toddlers had no books for children, and about a quarter (27%) had only one or two books. Figure 1 shows a comparison between the frequencies of reading, television viewing, and mobile media use in our sample.

[Insert Figure 1 here]

Socio-demographic variation in Saudi Toddlers' Screen Media and Reading-Related Practices

There was no significant effect for maternal education, paternal education, or household income on the onset age of screen use or the amount of screen time in our sample. The only SES effect was observed in households with higher monthly income as they had significantly more children's books at home than households with lower income, $\chi^2(2, N = 218) = 11.78, p = .003$.

Discussion

The purpose of this study was to provide a better understanding of screen media use in children under 3 in Saudi Arabia, the largest media market in the MENA region. The study reveals the prevalence of media devices in Saudi households with toddlers, the age at which young children are introduced to screens, the amount of time they spend with screens, the types of media contents children frequently view, and the prevalence of reading among toddlers compared to media use.

The study shows that Saudi homes with toddlers are saturated with media devices and new technology. One quarter of children under 3 in this study had their own portable media devices. In line with previous results (e.g., Bedford et al., 2016; Cheung et al., 2017), the current study showed that ownership of portable devices among young children increases with age.

The present study shows that more than 90% of children in the sample started watching television and using mobile media devices before the age of 2. It also shows that Saudi children's average overall screen time was about 3 hours per day. This exceeds the maximum amount of screen time recommended by several international health bodies such as the World Health Organization and the American Academy of Pediatrics which both call for no screen time for children younger than 2 years, and no more than 1 hour per day for children aged 2 to 5 years (American Academy of Pediatrics, 2016; World Health

Organization, 2019). Screen time among Saudi toddlers is also higher than screen time among children in the U.S. where 56% of children under 2 years do not use any screens and those who do, spend an average of 49 minutes of screen time a day (Rideout & Robb, 2020). The lack of awareness-raising efforts in Saudi Arabia about media use and reading by very young children could explain the excessive amount of screen time and low engagement in reading in this young population. Reports show that in countries where there are no clear guidelines on screen time, media use among babies and toddlers increases though this issue is highly debated (Etchells et al., 2017; Palmer et al., 2016; UK Parliament, 2019).

The time young children spend with media is important, but the content is crucial. Prior studies show that content has powerful effects on the extent to which children learn from media (Anderson et al., 2001; Tomopoulos et al., 2010). Children in the sample preferred *Iftah Ya Simsim*, an Arabic version of the American children's TV show *Sesame Street* as well as Arabic nursery rhymes and kids' songs. Given the low engagement with reading in the sample, watching educational shows rather than non-educational ones could be seen as a source for learning and literacy development. The finding that *YouTube* was the most favourite app among Saudi toddlers in this sample is not surprising, given that Saudi Arabia is the world's biggest user of *YouTube*, per capita (Smith, 2013). Caregivers reported that the mobile content their children engaged with was primarily children's songs, rather than educational apps and games. This contrasts with the findings of Rideout (2013) and Li et al. (2017), who report that toddlers and pre-schoolers in the U.S. engage with educational games and apps more than with other content.

This study also revealed how much more prevalent media use among toddlers is than daily reading. We found that reading to toddlers is very infrequent in Saudi homes, with reports of more than 40% of children never being read to, one quarter of children having no

children's books at home, and more than half having no more than two children's books at home. Although SES factors including parental education and household income were not found to be associated with screen media practices in our sample, households with higher income had significantly more books at home than those with lower income. This is the first study that provides data on reading to children under three in Saudi Arabia. A substantial body of research indicates that shared reading from the early years is one of the most important HLE components that are positively associated with long-term language and literacy outcomes (e.g., Farrant & Zubrick, 2011; Payne et al., 1994). The results from our study are therefore concerning, and even more so when compared to global figures, where half of children under 8 in the UK (Kucirkova & Littleton, 2016) and half of those aged 2 to 4 years in the U.S. (Rideout, 2017) are read to daily.

It is not entirely clear why the daily reading rates among Saudi parents and children are low. It is possible that the culture of reading for pleasure is not widespread among Saudis in general (Saudi General Authority for Statistics, 2018), although literacy rate among those 15 years and older is high (95%; UNESCO, 2017). It could also be that parents thought that their children were too young for reading and may not understand what is read to them. Another possibility is that screen time displaces time spent on reading. This possibility is supported by previous research suggesting that media use may displace other enriching activities such as reading, parent-child interactions, and play (e.g., Anderson & Pempek, 2005; Vandewater et al., 2006).

There are limitations to this study. First, the majority of the mothers in the study were well-educated and therefore our findings cannot be generalized to the overall Saudi population. We note, however, that levels of education among Saudi women are on the rise, with national statistics indicating that there are now more female college graduates than male

graduates (Saudi General Authority of Statistics, 2016). Furthermore, educated mothers may be more likely to believe in the importance of scientific research and are thus more likely to agree to participate in studies about children and their development. Regardless, future work should examine whether the same patterns of media profiles can be found in children of mothers from a more widely distributed educational attainment spectrum. Second, the current study focused on screen media use as a component of children's HLE in the digital age. We also wanted to compare screen use with reading as an HLE component that has been found to support children's development. Although we did not fully measure reading-related practices, we provided new data on reading patterns. This will set the stage for future research investigating potential displacement of reading by screen use, or trying to incorporate reading activities in children's apps and programmes.

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Impact Summary

Prior State of Knowledge: The early years are critical for development. Most existing data on digital media and literacy practices in early childhood comes from Western cultures. Research in other cultures is needed to broaden our global understanding of children's literacy and media environments. (40 words)

Novel Contributions: This study contributes data on the home literacy and screen media use practices of young children in Saudi Arabia, a population that is under-represented in the literature on children's media use. (34 words)

Practical Implications: Findings from this study indicate high engagement with media and low engagement with reading among Saudi toddlers. Understanding children's literacy and media use practices is an important first step in guiding the development of research-driven recommendations for parents and policymakers. (40 words)

Notes on contributors

Haifa Alroqi (PhD, The University of Manchester) is an Assistant Professor of Linguistics at King Abdulaziz University. Her research interests include screen media use in early childhood and its association to cognitive and language development. Recent research has focused on home activities during COVID-19 lockdown including shared reading and digital media use and their impact on vocabulary development.

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