

## RECOMMENDATION SYSTEMS, PARENTS, AND PRESCHOOL CHILDREN: THE STORY BEHIND DIGITAL TECHNOLOGY

LORENA MIHELAC

Potrjeno/Accepted  
3. 8. 2023

School center Novo mesto, Novo mesto, Slovenia

Objavljeno/Published  
29. 3. 2024

CORRESPONDING AUTHOR/KORESPONDENČNI AVTOR/  
lorena.mihelac@sc-nm.si

### Abstract/Izveček

A survey was conducted in November 2023, involving 554 Slovenian parents and their preschool-aged children. The survey aimed to investigate the following: (i) the way parents and their preschool-aged children employ social media and digital technology; (ii) the parents' comprehension of the term "information bubbles", and (iii) the parents' awareness of recommendation systems. Parental and child digital technology patterns and behaviours are correlated, according to the findings. The results suggest that most parents have a restricted understanding of the operational mechanisms of recommendation systems and how they contribute to the construction of "information bubbles."

**Keywords:**  
recommendation  
systems, parents and  
preschool children,  
digital technology,  
social media.

**Ključne besede:**  
priporočilni sistemi,  
starši in predšolski  
otroci, digitalna  
tehnologija, družbena  
omrežja.

### Priporočilni sistemi, starši in predšolski otroci: zgodba, ki se skriva v zakulisju digitalne tehnologije

Novembra 2023 je bila izvedena raziskava, v kateri je sodelovalo 554 slovenskih staršev in njihovih predšolskih otrok. Cilj raziskave je bil preveriti, (i) kako starši in njihovi predšolski otroci uporabljajo družbena omrežja in digitalno tehnologijo, (ii) kako starši razumejo pojav »informatičnih mehurčkov« in (iii) preveriti znanje staršev o priporočilnih sistemih. Glede na ugotovitve so vzorci in vedenja digitalne tehnologije staršev in otrok povezani. Poleg tega rezultati kažejo, da ima večina staršev omejeno razumevanje operativnih mehanizmov priporočilnih sistemov in tega, kako prispevajo k izgradnji »informatičnih mehurčkov«.

**UDK/UDC**  
316.472.4:004-055.2,  
316.472.4:004-053.4

DOI <https://doi.org/10.18690/rei.3488>

Besedilo / Text © 2024 Avtor(ji) / The Author(s)

To delo je objavljeno pod licenco Creative Commons CC BY Priznanje avtorstva 4.0 Mednarodna.

Uporabnikom je dovoljeno tako nekomercialno kot tudi komercialno reproduciranje, distribuiranje, dajanje v najem, javna priobčitev in predelava avtorskega dela, pod pogojem, da navedejo avtorja izvirnega dela. (<https://creativecommons.org/licenses/by/4.0/>).

## Introduction

In recent decades, digital technology has significantly and fundamentally altered the global scene. It has transformed various domains, including communication, information access, work processes, entertainment, healthcare, education, social interaction, innovation, privacy, and security (Burlacu et al., 2021; Entschew, 2021; Gui and Büchi, 2019).

The undeniable impact of digital technology is evident in the fast-changing world of modern parenting as well. Contemporary parents are facing the difficulty of raising children in a society where screens and devices are omnipresent. Digital technology has become an essential aspect of parenting, functioning as both a means for enhancing knowledge and a form of amusement (Livingstone and Byrne, 2018).

Although parents endeavour to stay informed of the constantly changing digital environment, a significant knowledge gap persists, specifically concerning recommendation systems (hereinafter referred to as RS). Parents frequently struggle to grasp the complexities of RS, which hinders their ability to understand how these systems intelligently select content for their children (Funk et al., 2009).

Furthermore, parental guidance faces a unique challenge in the form of “information bubbles”, which are frequent and pushed by RS. Although the objective of these systems is to customize content for individual users, they unintentionally foster the development of isolated information ecosystems that restrict the range of information accessible to preschool-aged children (Wineburg et al., 2016). Unaware of the mechanisms underlying recommendation algorithms, parents who rely exclusively on suggested content may unintentionally contribute to the continuation of these information bubbles.

At present, there is a lack of available data concerning the level of awareness among Slovenian parents of preschool children regarding RS and information bubbles. This study aims to address the existing research deficiencies in the literature. The paper presents first a brief overview of the present state in Slovenia concerning the usage and popularity of digital technology and social media by parents and their preschool children. In the continuation, the study examines two key subjects: (i) parental awareness of RS, and (ii) parental understanding of information bubbles.

## **Background**

The incorporation of technology has resulted in a major upheaval in daily existence, affecting our occupations, communication, and day-to-day habits. The population, particularly those born between 1990 and 2000, known as Millennials and Generation Z, underwent significant changes in their methods of communication, formation of relationships, and access to information. The transformation began with the introduction of instant messaging and expanded with the emergence of social networking platforms (de Castro et al., 2022). The formative years of these generations, encompassing adolescence and early adulthood, were influenced by the ubiquitous presence of digital culture, resulting in a substantial impact on their identities and viewpoints on the world (Chang and Chang, 2023).

Although digital natives, Millennials and Generation Z, now parents of a considerable number of preschool children in today's fast-paced, interconnected society, find themselves grappling with the challenges and opportunities presented by the digital age, and are forced to reconfigure conventional parenting practices. These parents are confronted more than ever with choices that were absent in past generations, such as supervising a child's usage of digital technology and integrating educational applications into recreational time (Benedetto and Ingrassia, 2021).

Today, the concept of a "digitally interconnected family" has become increasingly prevalent, as technology has become an essential component of our everyday existence. The contemporary family acknowledges the evolving significance of technology in the advancement of young children and strives to incorporate appropriate digital activities into the lives of preschoolers, while also considering their holistic physical, social, and cognitive development (Lim, 2018).

The incorporation of tablets, mobile phones, and educational apps into the learning process of preschoolers is ushering in a new era of early childhood education and experience. Given the significant amount of time parents spend with their children, it is anticipated that the attitudes and media usage of parents will influence and shape the media usage of their children (Lee et al., 2022). Research has indicated a correlation between the amount of time parents spend with media and the amount of time their children spend using media (Oh and Park, 2019; Poulain, 2019). Additionally, parents who adopt permissive or neglectful parenting styles tend to grant their children more freedom to engage with media (Coyne et al., 2017).

Contemporary, digitally well-educated parents face the challenge of managing their children's media consumption, and within this domain lies the frequently disregarded impact of recommendation systems (RS). These systems, "software tools and techniques that provide suggestions for items that are most likely of interest to a particular user" (Ricci et al., 2015:1), have a hidden, yet crucial influence on the information that parents come across on the internet.

These systems direct users toward movies, games, shopping, news, and apps, depending on their past interactions. With the ongoing advances in technology, parents are dealing not only with the obvious aspects of media consumption, but also with the subtle effects of algorithms that operate behind the scenes of RS, shaping their digital experiences. Although parents may make efforts to provide a secure and instructional online environment, RS may add unforeseen elements into the equation of choice (Seaver, 2019).

According to reports, certain RS possess poor algorithms, which implies that these algorithms do not effectively incorporate contexts, characteristics, and behaviours (Margalit, 2016). As a result, "filter bubbles" (information bubbles) are created, a concept introduced by Pariser (2011b), where information is selectively filtered based on individual users, removing any content that does not conform to a standardized pattern of similar information.

For children, filter bubbles/information bubbles refer to the use of RS and algorithms to control the information received when watching entertainment content, searching for (preschool-related) information, listening to music, or using social media for communication, even if this is done together with their parents. Therefore, instead of obtaining novel knowledge, preschool children are immersed in a familiar setting that offers security, and joy, while requiring minimum cognitive exertion. This can lead to a significantly restricted understanding of the world in the current day, excessive self-assurance, reduced creativity, and the incapacity to generate innovative ideas and engage in exploration (Izci et al., 2019).

Many individuals, including those who are proficient in using digital technology, remain unaware of the occurrence of such filtering and the intentional or unintentional construction of filter bubbles because of its subtle nature. While users may understand filter bubbles, it might be difficult to take control over how the filter operates and how it is used (Holone, 2016).

## Methodology

An anonymous online survey was conducted in November 2023 using Google Form to collect data, targeting parents of children who had been enrolled in kindergarten since the age of three. Questions about the decision-making process concerning the exclusive use of data for a single child were posed to parents with multiple children of similar age.

The survey link was subsequently distributed to parents by kindergarten principals, who were initially mailed the survey along with a description of its content. Additionally, the responses of parents to this survey were gathered online. R studio was used for the statistical analysis.

### *Participants*

A total of 554 parents responded to the survey. Out of these 554 parents, 86 were fathers (16%) and 468 were mothers (84%), aged from 23 years to 52 years (mean age = 35.64). The regions of Osrednjeslovenska (37.55%) and Gorenjska (22.74%) yielded the highest number of responses, followed by Podravska (15.70%), Primorsko-notranjska (9.39%), and Goriška (7.04%). The regions with the lowest response rates were Savinjska (4.69%), Jugovzhodna (2.17%), Posavska (0.36%), Obalno-kraška (0.18%), and Zasavska (0.18%).

The survey included a total of 554 preschool children, of which 252 (45.49%) were identified as female and 300 (54.15%) as male. For two children (0.36%) no gender was provided. One hundred and fifty-eight (28.52%) of these 554 preschool-aged children were three years old, 185 (33.40%) were four years old, 195 (35.20%) were five years old, and a mere 16 (2.88%) were six years old.

## Results

A university degree is held by the plurality of parents (refer to Table 1), followed by secondary school and college education. A considerable proportion of parents have also earned a master's degree. Out of the total 554 parents examined, only ten have earned a doctoral degree (PhD), while five parents possess only a primary school diploma. No statistically significant differences were found between the father and mother in terms of their academic degree.

Table 1: Academic degree obtained by parents.

	Primary	Secondary	College	University	Master's degree	PhD	Total
f	5	157	83	226	73	10	554
f %	0.90	28.34	14.98	40.79	13.18	1.81	100 %

To examine which of the digital devices/print media were the most popular and used in parents, seven different options were provided: television, mobile phone, radio, laptop/tablet, book, magazines, and newspapers. The results are shown in Table 2.

Table 2: Usage of digital devices and print media by parents.

Digital d./ p. media		Never	Rarely	Some-times	Often	Always	Total	Mean (SD)
Television	f	98	109	172	111	64	554	2.88
	f %	17.69	19.68	31.05	20.04	11.55	100	(1.25)
Mobile phone	f	23	62	128	146	195	554	3.77
	f %	4.15	11.19	23.10	26.35	35.20	100	(1.16)
Radio	f	97	127	141	117	72	554	2.89
	f %	17.51	22.92	25.45	21.12	13.00	100	(1.28)
Laptop/ tablet	f	156	150	130	71	47	554	2.46
	f %	28.16	27.08	23.47	12.82	8.48	100	(1.26)
Books	f	45	77	146	127	159	554	3.50
	f %	8.12	13.90	26.35	22.92	28.70	100	(1.26)
Magazine	f	180	129	136	70	39	554	2.11
	f %	32.49	23.29	24.55	12.64	7.04	100	(1.19)
Newspaper	f	237	118	123	51	25	554	2.11
	f %	42.78	21.30	22.20	9.21	4.51	100	(1.19)

There are no statistically significant differences between the use/popularity of digital devices and print media between mothers and fathers. The most popular media used by parents (see Table 2) is the mobile phone (mean = 3.77), followed by books (mean = 3.50). The least popular are magazines (mean = 2.11) and newspapers (mean = 2.11). Surprisingly, the laptop (tablet) is moderately popular (mean = 2.46).

Table 3 shows the usage of digital devices and print media by children. As for the parents, seven different options were provided: television, mobile phone, radio, laptop/tablet, book, magazines, and newspapers. The correlation between parents and children regarding the usage/popularity of print media is shown in Figure 1.

A correlation exists between parental usage (popularity) of digital devices and print media and their children's usage. A strong correlation was found in the use of television (0.51) and books (0.51), and a medium correlation in the use of radio (0.44). A medium correlation was found in the use of magazines (0.40), newspapers (0.36), and the laptop/tablet (0.31). Only a minor correlation was found in the use of mobile phones (0.25).

Table 3: Usage of digital devices and print media by children.

Digital d./ p. media		Never	Rarely	Some- times	Often	Always	Total	Mean (SD)
Television	f	39	75	127	136	177	554	3.61
	f %	7.04	13.54	22.92	24.55	31.95	100	(1.25)
Mobile phone	f	193	106	109	84	62	554	2.49
	f %	34.84	19.13	19.68	15.16	11.19	100	(1.39)
Radio	f	217	112	129	59	37	554	2.25
	f %	39.17	20.22	23.29	10.65	6.68	100	(1.30)
Laptop/ tablet	f	296	104	82	34	38	554	1.94
	f %	53.43	18.77	14.80	6.14	6.86	100	(1.24)
Books	f	45	77	146	127	159	554	4.00
	f %	3.25	6.86	22.38	21.84	45.67	100	(1.12)
Magazine	f	200	80	126	85	63	554	2.51
	f %	36.10	14.44	22.74	15.34	11.37	100	(1.40)
Newspaper	f	420	71	39	16	8	554	1.41
	f %	75.81	12.82	7.04	2.89	1.44	100	(0.85)

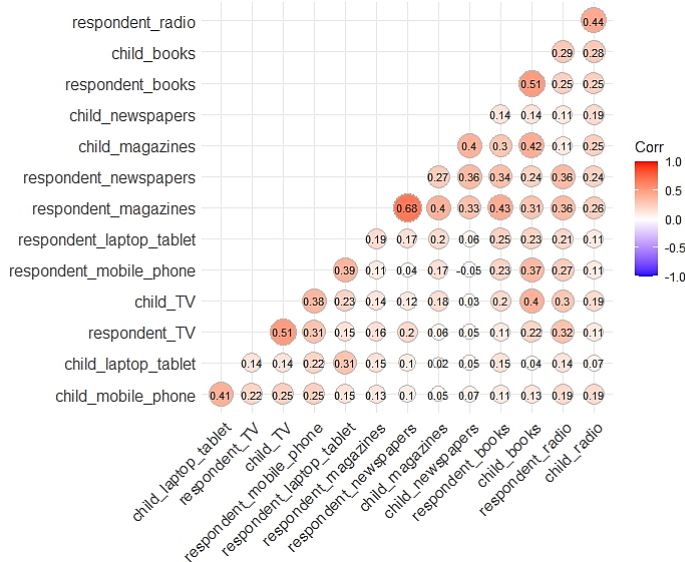


Figure 1. The correlation between the digital device and print media usage of children and their parents (respondents).

Table 4 shows the usage of social media by parents. As can be seen, the most popular social media are Facebook Messenger (mean = 4.17), YouTube (mean = 4.15), and Facebook (mean = 4.14). The least popular are Amazon Kids (mean = 1.24), and Spotify Kids (mean = 1.22). There were no statistically significant differences found between the father and mother in terms of their usage of social media.

Table 4. Use of social media by parents.

Social media		Never	Rarely	Some- times	Often	Always	Total	Mean (SD)
Facebook	f	28	23	73	148	282	554	4.14
	f %	5.05	4.15	13.18	26.71	50.90	100	(1.11)
Facebook Messenger	f	31	23	63	141	296	554	4.17
	f %	5.60	4.15	11.37	25.45	53.43	100	(1.14)
Instagram	f	154	59	83	98	160	554	3.09
	f %	27.80	10.65	14.98	17.69	28.88	100	(1.59)
Twitter (X)	f	386	81	38	26	23	554	1.59
	f %	69.68	14.62	6.86	4.69	4.15	100	(1.08)
YouTube	f	8	23	91	187	245	554	4.15
	f %	1.44	4.15	16.43	33.75	44.22	100	(0.94)
YouTube Kids	f	181	64	92	103	114	554	2.83
	f %	32.67	11.55	16.61	18.59	20.58	100	(1.55)
YouTube Music	f	180	71	96	105	102	554	2.78
	f %	32.49	12.82	17.33	18.95	18.41	100	(1.52)
Amazon Kids	f	483	33	22	8	8	554	1.24
	f %	87.18	5.96	3.97	1.44	1.44	100	(0.72)
Spotify	f	400	47	47	27	33	554	1.64
	f %	72.20	8.48	8.48	4.87	5.96	100	(1.19)
Spotify Kids	f	489	31	18	8	8	554	1.22
	f %	88.27	5.60	3.25	1.44	1.44	100	(0.71)
Netflix	f	243	63	74	66	108	554	2.52
	f %	43.86	11.37	13.36	11.91	19.49	100	(1.59)
VOYO	f	227	77	86	71	93	554	2.51
	f %	40.97	13.90	15.52	12.82	16.79	100	(1.53)
WhatsApp	f	242	63	79	71	99	554	2.50
	f %	43.68	11.37	14.26	12.82	17.87	100	(1.57)
TikTok	f	378	63	51	32	30	554	1.69
	f %	68.23	11.37	9.21	5.78	5.42	100	(1.18)
Snapchat	f	359	76	66	24	29	554	1.71
	f %	64.80	13.72	11.91	4.33	5.23	100	(1.15)



The same list of social media was used to obtain answers about their usage by the children.

Table 5. Use of social media by children.

Social media		Never	Rarely	Some- times	Often	Always	Total	Mean (SD)
Facebook	f	524	17	7	3	3	554	1.09
	f %	94.58	3.07	1.26	0.54	0.54	100	(0.46)
Facebook Messenger	f	529	11	9	3	2	554	1.08
	f %	95.49	1.99	1.62	0.54	0.36	100	(0.43)
Instagram	f	534	12	6	1	1	554	1.06
	f %	96.39	2.17	1.08	0.18	0.18	100	(0.33)
Twitter (X)	f	551	2	1	0	0	554	1.01
	f %	99.46	0.36	0.18	0.00	0.00	100	(0.18)
YouTube	f	151	83	130	92	98	554	2.82
	f %	27.26	14.98	23.47	16.61	17.69	100	(1.44)
YouTube Kids	f	267	50	89	64	84	554	2.36
	f %	48.19	9.03	16.06	11.55	15.16	100	(1.53)
YouTube Music	f	403	39	51	35	26	554	1.63
	f %	72.74	7.04	9.21	6.32	4.69	100	(1.17)
Amazon Kids	f	540	8	3	0	3	554	1.05
	f %	97.47	1.44	0.54	0.00	0.54	100	(0.35)
Spotify	f	541	6	4	0	3	554	1.05
	f %	97.65	1.08	0.72	0.00	0.54	100	(0.35)
Spotify Kids	f	545	6	0	1	2	554	1.03
	f %	98.38	1.08	0.00	0.18	0.36	100	(0.29)
Netflix	f	458	32	31	21	12	554	1.37
	f %	82.67	5.78	5.60	3.79	2.17	100	(0.91)
VOYO	f	425	38	42	23	26	554	1.53
	f %	76.71	6.86	7.58	4.15	4.69	100	(1.10)
WhatsApp	f	532	8	8	3	3	554	1.08
	f %	96.03	1.44	1.44	0.54	0.54	100	(0.45)
TikTok	f	530	15	3	4	2	554	1.07
	f %	95.67	2.71	0.54	0.72	0.36	100	(0.41)
Snapchat	f	531	18	2	2	1	554	1.06
	f %	95.85	3.25	0.36	0.36	0.18	100	(0.32)

A strong correlation between parents and children was found in the use of YouTube Kids (0.69), and VOYO (0.53), a medium correlation in the use of Netflix (0.46), YouTube Music (0.42), Amazon Kids (0.41), YouTube (0.37), and Spotify Kids (0.32).

According to the results, the utilization of digital devices, and print media among preschool children shows a tendency for supervision and joint participation primarily with parents.

Among the 554 parents surveyed, the majority claimed to oversee their children's internet usage (81%), as well as their usage of laptops/tablets (76%), mobile phones (71%), newspapers (67%), magazines (46%), television (39%), and books (28%).

Among the 554 parents who were surveyed, a substantial majority of 416 (75%) stated that they had received online recommendations regarding what to watch, listen to, and buy, and which other related activities to choose. Among the entire parent population, a mere eighty-five individuals (15%) expressed uncertainty, while fifty-three parents (10%) reported not having received recommendations. Thirty-seven percent of parents, which is equivalent to 204 individuals, expressed a keen sense of dissatisfaction with these recommendations. Another 25% (140 parents) reported being dissatisfied, while 32% (178 parents) felt neither dissatisfied nor content. A small percentage of 5% (26 parents) reported being satisfied, and just 1% (6 parents) expressed a high level of satisfaction.

While parents may be aware of the presence of recommendations, most lack sufficient understanding regarding the existence and functioning of the RS behind these recommendations (see Table 6).

Table 6. Familiarity of parents with recommendation systems.

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree	Total
f	103	61	201	107	82	554
f %	18.59	11.01	36.28	19.31	14.80	100 %

Comparable findings were observed with respect to parental awareness concerning the influence that recommendation systems exert on children's social media usage (see Table 7).

Table 7. Familiarity of parents with recommendation systems and their impact on children's social media usage.

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree	Total
f	152	78	142	81	99	554
f %	27.44	14.08	25.63	14.62	17.87	100

To determine whether parental age, level of education, and digital device/print media usage significantly predicted familiarity with recommendation systems, multiple linear regression was applied. A significant regression equation was found ( $F(12, 541) = 2.444, p < .001$ ), with an  $R^2$  of .030.

The individual predictors were examined further and showed that age ( $t = 2.31, p = .021$ ), and the use of laptop/tablet ( $t = 2.95, p = .003$ ) were significant predictors in the model.

Table 8 displays the parents' awareness regarding the presence of information bubbles. Most parents have limited understanding of information bubbles. No statistically significant difference was found between fathers and mothers regarding awareness about the existence of these bubbles.

Table 8. Parent's awareness of the existence of information bubbles.

Parent		Do not know	No	Yes	Total
Mother	f	210	86	172	468
	f %	44.87	18.38	36.75	100
Father	f	23	16	47	86
	f %	26.74	18.60	54.65	100

Most parents are also uncertain about their ability to have influence over information bubbles. Out of 554 parents, 276 (50%) answered "do not know", 174 (31%) answered "no" (31%), and only 109 (19%) parents answered "yes".

When asked to provide potential solutions for avoiding information bubbles, only a few parents (14.81%) replied by providing solutions such as "browsing without history", "deleting cookies", "using only necessary cookies", "not using media at all", "ignoring recommendations of RS", "there is no possibility to influence the recommendations", "seeking help from the Ministry of Education", and using "Adblocker".

## Discussion

Although research indicates that fathers are also dedicating an increasing amount of time to their children in many Western countries (Gauthier et al., 2004; Raley et al., 2012), most parents who responded to the survey were mothers. This was expected, given that mothers typically spend significantly more time with their children than fathers do.

This survey has shown no statistically significant differences between mothers and fathers regarding the usage of digital devices/print media. The mobile phone is the most widely utilized and well-liked digital medium. This is not surprising, given its portability and status as an integral “smart” component of society, facilitating tasks such as information retrieval, problem-solving, information storage, knowledge acquisition, and even entertainment through online and offline gaming (Szyjewski and Fabisiak, 2018).

Particularly intriguing is the prevalence of book popularity among parents who were born around 1990/2000 and who thus spent their childhoods immersed in the digital environment. Given that most of the parents surveyed possess a university degree (40.79%), the results align with those documented in a study by Mažgon et al. (2020), which discovered that individuals with a university degree reported being more committed readers (as well as having a greater preference for books) than the general population.

A correlation was found between parental usage of digital devices, print media, and social media and their children’s usage. This is in accordance with similar studies reporting that parent’s habits and usage of digital devices/print media, and social media are associated with their children’s usage (e.g., Bar Lev, and Elias, 2020; Celik, 2020; Lauricella et al, 2015; Vaala and Hornik, 2014). The correlation observed between parents and their children on some social media platforms was expected, given the age of the children.

Findings indicate that most parents are monitoring their preschool children’s use of digital devices and social media and are prepared to intervene if needed. Similar findings emerged from other studies, such as Livingstone (2007) and Livingstone and Helsper (2009). However, the question is whether monitoring the usage of digital devices and social media in their preschool children is always sufficient. As outlined by Dias et al. (2016: 419), there is a discrepancy between “what children actually know and do with digital technologies and what parents think they know and do”. A parent, aged 50, stated in a study conducted by Dias et al. (2016) that his 6-year-old daughter possessed the ability to independently locate and download applications from Google Play.

The findings indicate that while the majority of parents have encountered recommendations regarding what to watch, listen to, buy, and so on, they reported

having a limited understanding of how RS operate. The results indicate that age plays a significant role in comprehension of these systems, and older parents appear to have more experience.

This is consistent with findings by Beel et al. (2013), who found that age influences users' interactions with recommendation systems and that older users are more inclined to click on recommendations compared to younger users. The impact of laptop/tablets on experiencing recommendations/RS is confusing; however, plausible reasons could be the powerful operating systems of laptops/tablets, large screen, browsing experience, flexibility, better reliability, power, performance, and web loading time (Research.com, 2024).

Dias et al. (2016) found that contemporary preschoolers exhibit higher levels of resourcefulness and technology skill compared to children from two to three decades ago. They employ multiple techniques to discover content, manage their memory, and deal with advertisements. Therefore, preschool children can *potentially* encounter disturbing/inappropriate information and recommendations from RS if parents are not actively monitoring their children's use of digital devices.

Many parents indicated a lack of awareness regarding the impact that recommendation systems can have on their children's experiences with digital devices and social media through the creation of information bubbles. Parents may presume that the content offered to their children is carefully selected with their welfare in consideration. Nevertheless, the customized nature of recommendations can unintentionally confine access to particular viewpoints, thus constraining the range of their children's knowledge and experiences (Izci et al., 2019).

## Conclusions and future work

*"We shape our tools, and thereafter our tools shape us."*

*(Marshall McLuhan, media theorist)*

A survey was conducted in November 2023, involving 554 Slovenian parents and their preschool-aged children. The survey aimed (i) to investigate the usage of social media and digital technologies by parents and their preschool-aged children, (ii) to explore the comprehension of "information bubbles" and to establish (iii) the level of parental awareness concerning recommendation systems.

The findings indicate a correlation between the digital technology habits and behaviours of parents and children. The survey has also revealed that parents

acknowledge the significance of digital technologies and are aware of the necessity to supervise their children's utilization of digital devices and social media.

However, the findings also indicate that most parents have a limited comprehension of the functional mechanics of recommendation systems and their role in the building of information bubbles. Given the rapid growth and widespread availability of various forms of media (Pariser, 2011a, b), coupled with advances in technology making it increasingly difficult for individuals to access content that has not been customized to their preferences, modern parents will need to stay informed and to continuously update their knowledge. This will enable them to make informed decisions regarding their children's digital activity (Bar Lev and Elias, 2020; Naab, 2018).

According to Pariser's 2011 statement (Pariser, 2011b), it is anticipated that our decisions regarding what to watch, read, and see rely on a combination of nonprofessional 'editors' (our friends and coworkers) and software algorithms. However, it is also anticipated that at some point in the future, the widely employed personalization features of RS might replace proficient human editors.

From this standpoint, the proficiency of contemporary and future parents to comprehend and evaluate digital technology and social media will be highly important. Fortunately, there is a growing number of workshops, courses, events, and educational groups in Slovenia that strive to enhance digital and media literacy among parents. As the importance of literacy in the context of digital and media parenting is significant, future research should consider further exploration of this area (Golob et al., 2021). Moreover, professionals will be needed more than ever to support parenting in the everyday changing digital society, to determine how to face these innovations and challenges, what to "consume" of information, recommendations, and technology.

## References

- Bar Lev, Y. and Elias, N. (2020). Digital parenting: media uses in parenting routines during the first two years of life. *Studies in Media and Communication*, 8(2), 41–48.
- Beel, J., Langer, S., Nürnberger, A., and Genzmehr, M. (2013). The impact of demographics (age and gender) and other user-characteristics on evaluating recommender systems. In T. Aalberg, C. Paptheodorou, M. Dobрева, G. Tsakonas, C. J. Farrugia (eds.), *Research and Advanced Technology for Digital Libraries* (pp. 400–404), vol. 8092. Berlin, Heidelberg: Springer.
- Benedetto, L., and Ingrassia, M. (2021). Digital Parenting: Raising and Protecting Children in Media World. IntechOpen. doi: 10.5772/intechopen.92579

- Burlacu, S., Negescu, M. D. N., Pătărlăgeanu, S. R., and Vasilescu, R. A. (2021). Digital globalization and its impact on economic and social life. *SHS Web of Conferences*, 129(1), 06003.
- Celik, B. (2020). A study on the factors affecting reading and reading habits of preschool children. *International Journal of English Linguistics*, 10(1), 101-114.
- Chang, C.-W., and Chang, S.-H. (2023). The Impact of Digital Disruption: Influences of Digital Media and Social Networks on Forming Digital Natives' Attitude. *SAGE Open*, 13(3). <https://doi.org/10.1177/21582440231191741>
- Chaudron, S., Gioia, R. D., and Gemo, M. (2018). *Young children (0–8) and digital technology – a qualitative study across Europe*. Publication Office of the European Union.
- Coyne S. M., Radesky J., Collier K. M., Gentile D. A., Linder J. R., Nathanson A. I., Rasmussen E. E., Reich S. M., and Rogers, J. (2017). Parenting and Digital Media. *Pediatrics*, 140: S112–S116. doi: 10.1542/peds.2016-1758N.
- De Castro, C. A., O'Reilly, I., and Carthy, A. (2022). The evolution of the internet and social media: a literature review. *International Journal of e-Education, e-Business, e-Management and e-Learning*, 12(1), 30–41.
- Dias, P., Brito, R., Ribbens, W., Daniela, L., Rubene, Z., Dreier, M., Gemo, M., Di Gioia, R., and Chaudron, S. (2016). The role of parents in the engagement of young children with digital technologies: Exploring tensions between rights of access and protection, from 'Gatekeepers' to 'Scaffolders'. *Global Studies of Childhood*, 16(4), 414–427.
- Entschew, E. M. (2021). Acceleration through Digital Communication: Theorizing on a Perceived Lack of Time. *Humanist Management Journal*, 6, 273–287. <https://doi.org/10.1007/s41463-020-00103-9>
- Funk J. B., Brouwer, J., Curtiss, K., and McBroom, E. (2009). Parents of preschoolers: expert media recommendations and ratings knowledge, media-effects beliefs, and monitoring practices. *Pediatrics*, 123(3), 981–988.
- Gauthier, A. H., Smeeding T. M., and Furstenberg F. F. (2004). Are parents investing less time in children? Trends in selected industrialized countries. *Population and Development Review*, 30(4), 647–671.
- Golob, T., Makarović, M., and Rek, M. (2021). Meta-reflexivity for resilience against disinformation. *Communicar*, 29(66), 107–118.
- Gui, M., and Büchi, M. (2019). From use to overuse: digital inequality in the age of communication abundance. *Social Science Computer Review*, 39(1), 3–19. <https://doi.org/10.1177/0894439–3198511>
- Holone H. (2016). The filter bubble and its effect on online personal health information. *Croatian Medical Journal*, 57(3), 298–301. <https://doi.org/10.3325/cmj.2016.57.298>
- Izci, B., Jones, I., Ozdemi, T., Alktebi, and L., Bakir, E. (2019). *YouTube and young children: Research, concerns, and new directions*. Lisboa: Politécnico de Lisboa.
- Lauricella, A. R., Wartella, E. & Rideout, V. J. (2015). Young children's screen Time: The complex role of parent and child factors. *Journal of Applied Developmental Psychology*, 36, 11-17.
- Lee, H. E., Kim, J. Y., and Kim, C. (2022). The Influence of Parent Media Use, Parent Attitude on Media, and Parenting Style on Children's Media Use. *Children*, 9(1), 37. <https://doi.org/10.3390/children9010037>
- Lim, S. S. (2018). Transcendent parenting in digitally connected families. When the technological meets the social. In G. Mascheroni, C. Ponte, and A. Jorge (eds.), *Digital parenting, The challenges for families in the digital age* (p. 31-39). Göteborg: The International Clearinghouse on Children, Youth & Media at Nordicom, University of Gothenburg.
- Livingstone, S. (2007). Strategies of parental regulation in the media-rich home. *Computers in Human Behavior* 23, 920–941.
- Livingstone, S., and Byrne, J. (2018). The challenges of parental responsibility in comparative perspective. In G. Mascheroni, C. Ponte, and A. Jorge (eds.), *Digital parenting, The challenges for families in the digital age* (pp. 19–29). Göteborg: The International Clearinghouse on Children, Youth & Media at Nordicom, University of Gothenburg.

- Livingstone, S., and Helsper, E. (2009). Parental mediation and children's Internet use. *Journal of Broadcasting and Electronic Media* 52(4), 581–599.
- Margalit, L. (2016). Why trying to add personalization to websites has failed. *Entrepreneur*. Retrieved from <https://www.entrepreneur.com/science-technology/why-trying-to-add-personalization-to-websites-has-failed/286150>
- Mažgon, J., Kovač, M., Kovač Šebart, M., and Vidmar, T. (2020). Books in the time of screens: the reading habits of Slovenian students. *Universal Journal of Educational Research*, 8(9), 3916–3923
- Naab, T. (2018). From media trusteeship to parental mediation. The parental development of parental mediation. In G. Mascheroni, C. Ponte, and A. Jorge (eds.), *Digital parenting, The challenges for families in the digital age* (pp. 93–102). Göteborg: The International Clearinghouse on Children, Youth & Media at Nordicom, University of Gothenburg.
- Oh, J., and Park, Y. (2019). A study on preschoolers' smart media use and parents' perception. *Korean Journal of Child Care and Education*, 13, 3–26.
- Pariser, E. (2011a). *The filter bubble: how the new personalized web is changing what we read and how we think*. Penguin books, New York.
- Pariser, E. (2011b). *The filter bubble: what the Internet is hiding from you*. London: Viking/Penguin Press.
- Poulain T., Ludwig J., Hiemisch A., Hilbert A., and Kiess W. (2019). Media Use of Mothers, Media Use of Children, and Parent–Child Interaction Are Related to Behavioral Difficulties and Strengths of Children. *International Journal of Environmental Research and Public Health*, 16:4651. doi: 10.3390/ijerph16234651.
- Raley S., Bianchi S. M., and Wang W. (2012). When do fathers care? Mothers' economic contribution and fathers' involvement in childcare. *American Journal of Sociology*. 117(5), 1422–1459.
- Research.com (2024). Mobile vs desktop usage statistics for 2024. *Research.com*. Retrieved from <https://research.com/software/mobile-vs-desktop-usage#1> [2024, January 5]
- Ricci, F., Rokach, L., and Shapira, B. (2015). Recommender Systems: Introduction and Challenges. In F. Ricci, L. Rokach, and B. Shapira (eds.), *Systems Handbook* (pp. 1–34). Springer US.
- Seaver, N. (2019). Captivating Algorithms: Recommender Systems as Traps. *Journal of Material Culture* 24(4), 421–436.
- Szyjewski, G., and Fabisiak, L. (2018). A study on existing and actually used capabilities of mobile phones technologies. *Procedia Computer Science*, 126, 1627–1636.
- Vaala, S. E., and Hornik, R. C. (2014). Predicting US infants' and toddlers' tv/video viewing rates: mothers' cognitions and structural life circumstances. *Journal of Children and Media*, 8(2), 163–182.
- Wineburg, S., McGrew, S., Breakstone, J., and Ortega T. (2016). *Evaluating information: the cornerstone of civic online reasoning*. Stanford University, CA. Stanford Digital Repository. Retrieved from <https://purl.stanford.edu/fv751yt5934> [2023, December 28]

#### Author:

##### **Ddr. Lorena Mihelač**

School center Novo mesto, SGLVŠ, Šegova 112, 8000 Novo mesto, [lorena.mihelac@sc-nm.si](mailto:lorena.mihelac@sc-nm.si)/  
Faculty of informatics, Ljubljanska cesta 31a, 8000 Novo mesto, [lorena.mihelac@fis.unm.si](mailto:lorena.mihelac@fis.unm.si)  
Šolski center Novo mesto, SGLVŠ, Šegova 112, 8000 Novo mesto, e-mail: [lorena.mihelac@sc-nm.si](mailto:lorena.mihelac@sc-nm.si)/  
Fakulteta za informacijske študije, Ljubljanska cesta 31a, 8000 Novo mesto, e-mail: [lorena.mihelac@fis.unm.si](mailto:lorena.mihelac@fis.unm.si)