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The Use of Short-Video Mobile Apps in Early Childhood: a Case Study of Parental Perspectives in China

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ABSTRACT

Short-video mobile apps are an emergent media form and play a significant role in young children's everyday lives. We explored the parental perspectives of 2-to-6-year-old Chinese children's use of short-video mobile apps. We distributed an online questionnaire that received 266 valid responses from parents and conducted in-depth interviews with 20 parents to understand children's usage and parents' attitudes, roles and mediations. Results revealed the most frequently watched genres were animated stories and reviews of toys. The affordances of short-video apps appeared to break children's normal media-use routine. Most parents acknowledged both the educational and intimate/family value as well as the psychological risks of short-video apps and tended to employ restrictive mediations to regulate children. We discuss different parental and children's attitudes towards using short-video apps. We also suggest parents initiating various mediated strategies according to dynamic contexts. We propose strategies for parents/caregivers, policy makers and technology designers for creating a vibrant and trustworthy media environment for young children.

Introduction

With newly affordable mobile devices and the availability of high-speed internet, many preschool children are able to access online video sharing apps (e.g., YouTube) using touch-screen devices (Hiniker et al. 2016). Recently, short-video mobile apps such as Douyin (Chinese TikTok) and Kwai (Kuaishou) have become the most popular social media platforms worldwide (CNNIC 2019; Ofcom 2020). According to the China Internet Network Information Center CNNIC 2019 annual report, 7.59 billion of the Chinese population used mobile phones to access videos (mostly short videos), and approximately 4% of these users (around 30 million) were young children under 10 years of age (CNNIC 2019). The popularity of short-video apps among young children has also been reported in Ofcom (2020). The statistics reveal that short-video mobile app use has become an integral part of children's everyday experience.

The emerging short-video mobile apps share common characteristics with traditional video-sharing platforms such as YouTube. Common characteristics include user generated content (UGC), a strong social emphasis and a participatory culture (Zhang, Wu, and Liu 2019). However, short-video apps also have unique characteristics. They (1) support users viewing and sharing fragmentary looping videos, ranging from a few seconds to a few minutes, as a form of play and social activity (Zhang, Wu, and Liu 2019); (2) integrate sophisticated video-editing tools enabling novice users to generate portrait-mode personalized videos with creative audiovisual remixing effects (e.g., creative filters, split screen, slow motion) (Bresnick 2019); and (3) run on mobile devices wherein users can watch fast-paced, non-stop video feeds and capture live moments anytime and anywhere (Bresnick 2019). These characteristics turn short-video apps into a significant virtual community for younger generations, particularly in families with young children.

Despite the popularity of short-video apps, there has been an ongoing debate about their use among children. On the one hand, research has suggested their advantages of attracting children's attention through playful experience (Elias and Sulkin 2017), providing informal learning opportunities (Lu et al. 2018; Zhao 2019), offering creative practice (Neumann and Herodotou 2020), and improving digital and media literacy (Marsh 2016). On the other, there is considerable evidence of risks such as accessing unsafe content or becoming addicted to the medium (Li, Chris, and Yang 2019; Zhang, Wu, and Liu 2019).

While many researchers have placed their focus on young YouTubers in the United States (US) and European Union (EU), few studies have investigated how and why Chinese children use emerging short-video apps, and even fewer have focused on preschool children who have limited technical and social skills. Unlike older children, young children's usage is often closely correlated with parents' attitudes and regulations (Plowman, McPake, and Stephen 2010). It is therefore appropriate to perceive young children's use as a collaborative activity that reflects the mutual decisions and understanding of both parents and children.

In this study, we aimed to explore how children aged 2–6 years use emerging short-video mobile apps, mainly from parents' perspectives. We employed a socio-technical approach to examine which social aspects of a family system (e.g., parents' attitudes, roles, and mediations; children's skills; and parent–child interactions) and which technical aspects of the emerging technology (e.g., the unique design and technical features of short-video apps) potentially influence children's usage. We primarily focused on parental perspectives because (a) the shared activity includes both parents and young children, and (b) it is feasible to obtain authentic/in-depth data through interactions between researchers and parents who arguably hold equitable power. In this regard, we formulated three research questions: (**RQ1**) What are young Chinese children's usage routines concerning short-video mobile apps, in terms of frequency, duration, context and platforms? (**RQ2**) What genres do young children frequently watch? And (**RQ3**) what are the parents' attitudes, roles, and mediations towards children's use of short-video apps? Answering these research questions may inform technology designers, parents and other caregivers, and policy makers in determining the effective design, service, and regulation of short-video mobile app use for young children.

Literature review

Children's use of online video-sharing platforms

Children's use of online video-sharing platforms has been richly explored from the perspective of (1) children's interaction and practice (*the behavioral level*) (Hourcade et al. 2004; Livingstone et al. 2014; Marsh et al. 2018); and (2) the associated advantages and risks (*potentials and risks*) (Elias and Sulkin 2017; Li, Chris, and Yang 2019).

The constantly developing motor and cognitive skills of young children enable them to learn how to interact independently with touch-screen devices and online video-sharing apps. According to Piaget's theory (De Ribaupierre 2001; Piaget and Inhelder 1969), children's development process can be generally divided into four stages: the sensori-motor stage (from birth to 2 years), preoperational (2–7 years), concrete operational (7–11 years), and formal operational (adolescence through adulthood). The sensorimotor stage focuses on the development of motor skills, wherein the acquisition of knowledge is achieved through physical interaction and trial-and-error activities. The preoperational stage enables children to further develop motor skills, language, memory, and imagination abilities.

Although Piaget's theory can partially explain young children's motor and cognitive abilities to interact and learn from touch-screen devices, it does not fully consider the role of social and cultural factors in children's performance of tasks, wherein Vygotsky's (1978) socio-cultural perspective provides further explanation. Vygotsky believed that learning is social; and children can complete a task with what Wood, Bruner, and Ross (1976) described as *scaffolding* (help) offered by adults or peers before they can complete it on their own. When young children use interactive systems such as short-video apps, scaffolding can be offered through guidance from parents and/or design features of the system (e.g., easy-to-use interaction and instructions), both of which can reduce the steepness of the children's learning curve.

Empirical studies have identified evidence of young children's ability to interact and learn from touch-screen devices. Hourcade et al. (2004) conducted a content analysis of YouTube videos on toddlers using an iPad, and found more than 90% of the children aged 2 years already displaying moderate ability to interact with touch-screen devices. Livingstone et al. (2014) presented a qualitative study to investigate 0–5-year children's use of tablets at home in 10 United Kingdom (UK) families. The results showed that young children were able to navigate a range of apps using visual and audio modalities. Marsh et al. (2018) presented a large-scale survey of 2000 UK parents of children aged 0–5 years, identifying *unboxing* and *Play-Doh* videos as the key drivers of using YouTube. As noted by Burroughs (2017), the YouTube Kids app has directly targeted the young children's market, and its simple touch functions are purposefully designed to support the use of younger users.

Much research has explored the influence of online videos on children. Elias and Sulkin (2017) argued the comic artistic form and surprising content of various online videos (*unboxing, challenges, silly skits)* attract young children's interests. In addition to the

entertainment purpose, watching online videos may facilitate children's learning, especially when parents are involved (Neumann 2018). Neumann and Herodotou (2020) argued that video media with specific design principles can influence children's learning and educational outcomes. A specific example is found in a US kindergarten, wherein teachers used YouTube playlists and search function to promote young children's reading and literacy skills (Pyles et al. 2020). Short videos and live streams also provide an informal learning venue where children can easily access vernacular culture and life skills that they do not usually encounter as part of their school education (Lu et al. 2018; Tong 2019). Participatory activity can also foster children's creativity through self-expression and innovative practice (Neumann and Herodotou 2020). Furthermore, the use of online videos may offer young children opportunities to learn digital literacy and media skills (Marsh 2016). However, accessing online videos can expose young children to certain risks, particularly in the absence of gatekeepers. For example, children may view inappropriate content, such as violence, pornography, or embedded advertisements, become addicted to online content, or reveal their private and personal data (Buzzi 2011; Elias and Sulkin 2017; Li, Chris, and Yang 2019).

Parental attitudes, roles, and mediation

Considerable research has focused on parents' attitudes to online videos. Parents who perceived video viewing as a means of empowering children tended to allow children to watch more (Lauricella, Wartella, and Rideout 2015). Parents seemed to be less concerned about younger children's online safety than that of older children because they believed younger children would only watch suggested content (Plowman, McPake, and Stephen 2010). Many parents had little awareness that inappropriate content was just a few clicks away from the content currently playing (Buzzi 2011).

Studies have revealed parents' roles and mediations in children's use. Livingstone and Helsper (2008) identified five parental mediation strategies on the internet and mobile media use among school-aged children in the UK. The strategies were *active mediation of internet use* (e.g., talking about the contents and being present), *active mediation of internet safety* (e.g., recommending content), *restrictive mediation* (e.g., limiting viewing time), *technical restrictions* (e.g., using safe mode), and *monitoring* (e.g., checking up after use). However, this study was aimed at general internet use and was conducted with teenagers (12–17 years). In a qualitative study with 0–8 year children and parents in 10 families, Livingstone et al. (2014) found parents frequently employing *restrictive mediation* to regulate children's use of online technologies, followed by *active mediation* and *co-use*. Parents appeared to play different roles, with fathers being more laissez-faire or facilitating children's use and mothers tending to guide or control children's use. Nikken and Jansz (2014) conducted an internet-survey with 792 Dutch parents of children 2–12 years, showing parents partially using the same strategies for the internet as they used for television and video games (i.e., *co-use, active mediation, restrictive mediation*); they also employed new strategies such as *supervision* and *technical safety guidance*. A more recent qualitative study synthesized the data of 14 national reports from a European-scale study on children's use of digital technology (Brito et al., 2017). The results revealed that parental attitudes about the technologies can significantly influence parental mediation style and influence children's relationship with digital media.

Hiniker et al. ([2016](#)) further explored how parents mediated viewing of YouTube by children aged 14 months to 5.5 years. The results indicated parents' negative attitudes towards the *autoplay* and *recommended* functions, due to increasing difficulties in identifying the transitions between videos. Neumann ([2018](#)) coded videos of 55 parent–children dyads playing on an iPad, with the aim of investigating what kinds of scaffolding (i.e., *cognitive, affective*, or *technical*), attitudes, and mediations were directed towards children's media use. The results showed parents most frequently using cognitive scaffolding and least frequently using technical scaffolding to support children's learning; and younger children required more scaffolding from parents. The results suggest training for parents in using scaffolding strategies during the co-use of digital technologies have the potential to support children's early learning.

Theoretical background

The socio-technical theoretical approach was initially introduced to better understand organizations, with an central emphasis on the characteristics of *social systems* (e.g., members' attitudes, skills, values and relationships, organizational rules) and *technical systems* (e.g., tasks, processes, technology) that contribute to successful organizations (Trist [1963](#)). This theoretical approach was widely used to analyze how an emerging technology is adopted in an organization (Appelbaum [1997](#); Krotov [2015](#)). Recently, it has been applied to exploring user behavior in online communities and on social media from both social and technical perspectives (Wan et al. [2017](#); Zhang, Wu, and Liu [2019](#)).

Families have been defined as the smallest unit of social systems (Kayany and Yelsma [2000](#)). Modern families possess an additional technological dimension introduced by media technologies such as tablets and apps (Kayany and Yelsma [2000](#)); the short-video app is also a socio-technical information platform (Zhang, Wu, and Liu [2019](#)). Both the social and technological dimensions are important for understanding modern families' use of these emerging media (Flichy [2008](#)).

In our research, we use the social-technical approach as a theoretical lens to analyze young children's use of emerging short-video mobile apps. From the social aspect, we focus on (a) parent–child interactions in children's use of short-video apps (i.e., parental mediations and involvement), and (b) the impact of social media on children's use, and social and learning behaviors. From the technical aspect, we emphasize the unique design features and functions of emerging short-video mobile apps (e.g., entertainment, personalization and fragmentation) and the potential impact on children's and parents' usage and attitudes.

Methodology and methods

We used a mixed-method approach since this approach allows us to investigate the general trends on children's use routines, but also to obtain deep insight into parents' attitudes and meditation strategies. We conducted an online survey of 266 Chinese parents who have children aged 2–6. The questionnaire was developed based on previous research (Ji and Shen [2019](#)) (see Appendix S1 in supplemental

materials). We then conducted a semi-structured interview with 20 parents.[1] We also collected diaries of available media used, such as children's playlists and previous short videos taken by parents, in order to obtain a holistic view of their experience.

Parents who participated in the survey were recruited from a local commercial online survey service called *Wenjuanxing* (similar to *SurveyMonkey*) that includes a wide range of respondents. Parents who attended the interview were recruited from the online social platforms of WeChat and Douyin by using the snowball sampling technique. All parents who participated provided written consent. This study was approved by the Research Ethics Committee of the Communication University of China.

We received 372 questionnaires in total within 1 month in November 2019. The eligibility criteria for valid responses were (1) questionnaire answers were complete; (2) parents have at least one child aged 2–6 years; (3) parents lived with and took care of the child; and (4) questionnaires were completed by parents. We excluded invalid responses (e.g., incomplete answers, children living with grandparents) and a total of 266 valid responses were included in the final analysis. The parents were from 16 provinces and municipalities in mainland China. Seventy-three percent of parents were 30–40 years, 21% were 20–30 years, while 6% were above 40 years. Of the parents, 68% were mothers, while 32% were fathers. Eleven percent of parents finished high school, 87% had bachelor's degrees, and 23% had master's degrees or higher. Of the families, 56% had only one child, while 44% had more than one child. Fifty-three percent of children were girls, while 47% were boys, with an average age of around 4 years. All families had at least one mobile device at home.

We also conducted an online interview with additional 20 parents from January to March 2020. During that period, the COVID-19 pandemic broke out. Parents and children had to stay home. We believed online interviews enabled us to capture any potential changes of children's usage and parents' attitudes before and after the pandemic. Based on our questionnaire design and its preliminary results, we developed our interview protocol and questions (Appendix B).

We received 26 responses of agreement and then purposefully sampled 20 interviewees[2] to represent various levels of socio-economic status (SES), i.e., three low, five high, and 12 middle-level families, from cities representing different levels of economic development in China (i.e., six tier-1, eleven tier-2 and three tier-3 cities). The parental participants were 14 mothers and 6 fathers, with an average age of 29. Sixteen families had two children while four families had one child. The demographic details of the parents and children can be seen in Table 1. Each interview took approximately 30–40 minutes via video call.

We used quantitative and qualitative analysis to address our three research questions. Our quantitative analysis included descriptive analysis of the percentages in the online questionnaires, including children's regular use routines (RQ1), children's frequently watched genres (RQ2), and parents' attitudes, roles, and mediations (RQ3). The qualitative analysis included thematic analysis of the parental interviews, with a particular emphasis on RQ2 and RQ3. The two researchers used an open-coding strategy to code parents' interviews. The researchers, who are native Mandarin speakers, first coded the transcripts individually and then

Table 1. Demographic information of the participants (*M stands for Mother, F stands for Father*).

ID (Years of Age) Parents	Information Children	City	SES	ID (Years of Age) Parents	Information Children	City	SES
M1 (38)	2-year-old girl	Beijing (tier 1)	Middle	**M11 (38)**	2-year-old boy	Hangzhou (tier 2)	Middle
F2 (36)	5-year-old boy	Hangzhou (tier 2)	High	**M12 (30)**	6-year and 2-year boys	Taiyuan (tier 2)	Middle
M3 (37)	6-year girl	Beijing (tier 1)	Middle	**F13 (34)**	6-year girl and 3-year boy	Beijing (tier 1)	Middle
F4 (32)	3-year boy	Hangzhou (tier 2)	High	**M14 (31)**	4-year boy	Taiyuan (tier 2)	High
F5 (37)	5-year boy	Beijing (tier 1)	Middle	**M15 (28)**	3-year boy	Taiyuan (tier 2)	Low
M6 (30)	3.5-year boy	Hangzhou (tier 2)	Middle	**M16 (33)**	3-year girl	Nanjing (tier 2)	High
M7 (29)	4-year boy	Hangzhou (tier 2)	Middle	**F17 (29)**	5-year and 2-year boys	Wuhu (tier 3)	Low
M8 (28)	2.5-year boy	Hangzhou (tier 2)	Middle	**M18 (30)**	3-year boy	Wuhu (tier 3)	Low
M9 (30)	3.5-year boy	Hangzhou (tier 2)	Middle	**M19 (34)**	2-year girl	Shanghai (tier 1)	Middle
M10 (34)	4-year boy and 2-year girl	Beijing (tier 1)	Middle	**F20 (31)**	4-year boy	Wenling (tier 3)	High

discussed to gain consensus; they then discussed the codes using affinity diagramming as a modified version of grounded theory analysis to find and group the themes that emerged.

Results

Children's use routine: Frequency, duration, context and platforms

In questionnaires, 83% of the young children had used short-video mobile apps before. Approximately, 13% of the children used the apps many times daily, and more than half used them many times weekly (25%) or monthly (27%). Most children (59%) watched short-video apps lasting up to 30 minutes, followed by those between 30 minutes to 1 hour (27%) and 1–2 hours (12%).

Around half the parents (47%) reported children were allowed to use short-video apps as they made requests. The main contexts included: *entertainment and relaxation* (50%), *passing time* (37%), *keeping quiet in public spaces* (32%), *companionship when parents were not available* (26%), and *learning* (22%). Children watched short videos on multiple platforms, including IQiyi and Qibabu (52%), Douyin (41%), Youku (24%) and WaChat (20%).

Interview results were generally consistent with questionnaires but revealed more details of (1) longer screen time during the COVID-19 pandemic period, and (2) details of children's behavioral patterns and contexts of use. Specifically, three parents projected the content to a larger display in order to protect children's eyesight and share content with family members. Many parents restricted children's screen time to 5–10 min each time; they also set up rules for total screen media use time daily (e.g., 1–2 hours for TV and gameplay). One-third of parents designated a particular watching-time (e.g., before sleeping, during or after lunch) to avoid children's requests to watch when they felt

bored, since '*it was easy for them to think of watching when they saw my mobile phone*' (M12). More than half the parents mentioned that children wanted to watch if (a) they saw parents or older siblings using mobile phones; or (b) they glanced at short videos featuring their friends, family members, or themselves. Several parents even attempted to hide their mobile phones while staying home, although the trick sometimes failed.

M7: I'd like to hide my phone while staying home. I did it once and hid my phone under the pillow. When my son asked to watch videos on Qibabu, I said 'Oh, Mummy cannot find her phone.' … After a while, my son held my phone and walked from my bedroom, saying: 'Mummy, I found it for you.'

Our results suggest that fragmentary content and ubiquitous mobile phones tend to break children's normal use routines and invite them to have quick but multiple uses daily. Parents therefore have to manage children's use by setting up explicit rules (e.g., designating a particular use time) or employing tricks (e.g., hiding phones).

Frequently watched genres

The questionnaire results revealed six genres children watch most often, including (1) *entertainment and play* (animated stories and toy reviews, 64%); (2) *academic knowledge acquisition* (languages or science knowledge, 56%); (3) *life skills and creative practices* (painting or handicrafts, 52%); (4) *personal and family videos* recorded in the past (family travelling vlog, 34%); (5) *news and social norms* (discussion of social moral values and laws, 24%); and (6) *culture and history* (travel and cultural knowledge, 19%).

Interviews further indicated that: most children loved watching *unboxing* and *toy play* videos; many had preferences for short animations of nursery rhymes in Mandarin or English; and some enjoyed watching funny videos including pet cats and dogs. Eight parents said their children often asked to watch short videos featuring friends, family members or themselves repeatedly, and were interested in seeing overlay visual effects (e.g., cartoon-style animated and augmented rabbit ears). Half the parents mentioned they intentionally encouraged children to watch short videos about Covid-19 to teach them healthy habits (e.g., handwashing) and social responsibility (e.g., volunteering).

The interviews also showed that most parents helped children find their favorite videos by conducting keywords search (e.g., toys, cars, animals). Seven parents specifically pointed out the children enjoying controlling apps on their own. Several parents were even a little surprised their children were resourceful in finding videos through the previous playlist records and recommended video thumbnails.

M10: We used to project short videos on TV, but he didn't like that. This may be because he couldn't easily switch videos on TV by just tapping and sliding.

F6: My girl sometimes changes content by herself if she doesn't like to watch the videos that we select for her. One day we were surprised to see she used the previous playlist to play videos.

Parental attitudes, roles, and mediation

More than half of the parents responding to the questionnaire (55%) believed short-video apps could broaden children's horizons and help them understand the diversity of cultures and societies. Other potential benefits included entertaining children and cultivating their personal hobbies (49%), learning language and life skills (44%), recording personal lives and memories (26%), and self-expression and social development (12%). However, half the parents also brought up the concerns about too much screen time (52%). One-third of parents raised concerns about unsafe content such as violence and bad language (27%). Approximately, 10% of the parents simply believed that watching short videos was meaningless and a waste of time for young children (9%).

The interview results provided complementary explanations of positive attitudes from parents. Many parents believed that short videos such as *unboxing* videos provide a virtual playground for young children to relax and experience toys for free. Several parents argued for the advantages of storytelling and knowledge visualization of short videos. The shorter form may easily capture children's attention, while the creative and artistic representations were appropriate for demonstrating life skills (e.g., wearing clothes, cleaning up), social norms and values (e.g., lining up, social responsibility), and simple academic knowledge (e.g., colors, numbers). Short videos can also work as a mutual memory repository and potentially increase family intimacy.

M8: I felt that the length of short videos is appropriate, since they can quickly tell a story in a few minutes . . .. I just wanted him to watch a few minutes and then go to sleep.

F5: My son learnt the English word 'blue' through repeating watching these videos. . . . I also played him short videos on how to wash his hands in the COVID-19 pandemic period.

M10: These videos (we had recorded) reminded me of the good times we spent together

Most parents also pointed out three main risks. First, several parents noted the difficulty in finding interesting but appropriate content for children in Douyin and Kwai. The *autoplay* function increased the difficulty for parents to control the content, while Teen Mode (Safety Mode for Teenagers) filtered the creative content. Second, despite a few short video apps specifically designed for young children (e.g., Qibabu, similar to YouTube Kids), their videos seemed homogeneous in terms of genres and aesthetics (mainly animated stories); and child-centric apps did not contain any UGC or social features, an important characteristic of short-video mobile apps. Third, young children have lower regulating ability, and too much screen time could impact their physical and mental development.

F4: I used Douyin a lot, but I found it difficult to find appropriate videos for children. Because it automatically pushes videos based on my previous watching content . . . But you never know what will be played next.

M9: In order to filter inappropriate content, I even tried its Teen Mode. But I found nothing left. It filtered the risky videos, but also filtered the interesting ones.

Almost all the parents (99%) in the survey took the mediating role to regulate children's content safety and screen time. The interview revealed three parental roles. Parents tended to stay with children if (1) children were younger and could not switch content themselves (*operator*); (2) parents wanted to explicitly teach children a certain body of knowledge (*educator*); or (3) parents did not fully trust the contents and used a set of

strategies including recommendations, restrictive rules, technical restrictions to ensure the appropriateness of the contents (*gatekeeper*). However, half of the parents in the interviews reported they would leave children alone if they believed the video contents were safe. A typical scenario was that parents first helped children find certain content and then going away to do their own thing.

Our interviews also revealed specific meditating strategies on content safety. Many parents used *restrictive mediations* by directly choosing the appropriate content for children. Several used *technical restrictions* by activating the Teen Mode. Only a few parents used *active mediations* because they believed recommendations may not work well for young children. *Co-use strategy* was only employed when parents needed to operate, teach, or share family memories with children.

All the parents employed certain rules to regulate children's screen time. We identified three main strategies: *enforce, enable* and *encourage*. The most frequently used strategy was to set up strict rules before the activity. When the time was up, the device was directly taken away by the parents no matter if the children would cry or fight (*enforce*). The second was to specify the rule beforehand, although parents gave some leeway by allowing children's certain requests, such as longer screen time (*enable)*. A few parents asked children to decide the watching duration and asked children to stop and turn off the app (*encourage*). Most parents argued for the effectiveness of the *enforce* strategy. Although this strategy may cause conflicts, parents believed these conflicts could be easily resolved once children's attention was switched off.

Discussion

Interrelated factors in parental and children's use of short-video apps

According to the socio-technical approach, parent–child social interactions in contemporary family systems are complex, wherein social and technical elements are interdependent and interrelated and changing one aspect will affect the other. Parents' and children's exceptions about short-video apps can influence their routines for use and interaction; the specific design features of the technology also impact how their expectations could be realised. Understanding these interrelated factors may provide insight for professionals into designing appropriate products and services, which may in the long run reciprocally benefit parents and children.

In our study, parents and young children demonstrated consensus about using short-video apps although they may have different goals for their use. We found that (1) several parents treat short video viewing as a safe digital entertainment 'pacifier' that supports edutainment for children while also allowing parents to deal with their own business *(entertainment feature)*; (2) some parents perceive the unique edutainment value of short videos as attention grabbing and rich resources that expand children's knowledge and creative practice within short time slots (*entertainment and fragmentation features*) (Zhang, Wu, and Liu 2019); and (3) a few parents see viewing short videos that they have recorded personally as a shared parent–child social activity that can capture and preserve good and memorable moments in everyday family life and help to increase parent–child intimacy (*personalization feature*) (Bresnick 2019).

From the perspective of young children, entertainment is the primary goal, although children may also socialize virtually with people depicted in the videos or unconsciously learn through playful digital practice. The interviews also revealed that young children like to control the use of short video apps on their own. This may be because a sense of control (autonomy) is invoked when children are able to (partially) determine what to watch and successfully interact with the apps to accomplish their goals (competence). A sense of connection with others (relatedness) may also be gained when they watch videos of other children playing with toys or videos that include their friends.

Parents' and children's attitudes indicate a general acceptance of these emerging media and their unique capacity to attract attention, although parents may not be satisfied with the content provided by current apps. The results suggest the necessity to consider the needs of both parents and young children when designing child-centric short-video apps. Professionals in the digital media industry could consider (1) designing apps with multiple modes that can both enable children's independent use (while still maintaining parents' authority to know and control to a certain extent) and support parents' active involvement and shared parent–child activities; (2) incorporating features and functions to actively invite and guide children's inter-actions and evoke children's autonomy and competence; and (3) balancing entertain-ment, educational and commercial goals when planning short video content, to maintain a vibrant and healthy development of the short-video industry.

Beyond issues of screen time and low-value content

As an emerging platform, short-video apps have brought up both opportunities and risks in social and technological aspects to children and parents. Similar to previous research on digital media and online videos (Li, Chris, and Yang 2019; Zhang, Wu, and Liu 2019), Chinese parents' primary concerns in our study were around young children's excessive screen time, followed by accidental access to low-value content, such as those that include vulgarity or that are not 'positive' enough. However, in contrast to previous research arguing that parents were less concerned about younger children's online safety (Plowman, McPake, and Stephen 2010), our study revealed that parents were even more concerned about younger children's online safety, attempting to protect them with carefully selected content.

Interestingly, parents did not take embedded advertisements (e.g., for toys) seriously, nor videos promoting intangible values (e.g., money worship), or self-abusive tendencies (e.g., over-eating). None of the parents had ever considered the long-term impact of these short videos on young children's diet, lifestyle, or personal values. We assumed that the short, entertaining, and portrait-screen visual representation may conceal the authority of short videos, which tends to make parents focus on the 'right-now moments' rather than consider their long-term impact.

We suggest that collective action should be taken by governments, creators of media platforms, and social communities. First, policy makers should consider establishing regulations and censorship guidelines of short videos for young children with regard to advertisements and other content-embedded 'invisible' values and persuasions. Second, the creators of media platforms should realize their core value as a vibrant and healthy digital public sphere and consider new business models, transforming themselves in the

long run from advertising agencies to more trustworthy, responsible and public-regarding institutions. Third, social communities or public services should seek to enhance the media literacy of young parents so that they can become more capable of choosing age-appropriate content for young children.

From restrictive to dynamic and participatory mediation

Parents' meditating strategies play an important role in supporting an ecological relationship between young children and the new technology within a family system, so that technology can empower children's long-term development in emotion, cognition, and meta-cognition (e.g., self-regulation).

In our study, Chinese parents mainly used restrictive strategies to regulate children's viewing content and screen time, although they would like to be able to provide cognitive scaffoldings if needed. Two reasons may account for this result. First, most parents were concerned about the content safety and screen time, and their attitudes can influence their meditation style (Brito et al., 2017). Second, Chinese parenting practices are largely based on the concepts of *chiao shun* (to train) and *guan* (to govern and to love) (Wu 2013). In general, our results are consistent with previous research into online media wherein the dominate strategies were restrictive (Livingstone et al. 2014; Nikken and Jansz 2014).

The present study further highlights three types of strategies (*enforce, enable*, and *encourage*) parents used to regulate children's screen time. The strategies revealed the dynamic power relationships in parent–child social interactions during the use of short-video apps. We suggest parents leverage the use of these strategies to facilitate children's development of digital literacy. Parents can gradually switch from an *enforcing* strategy to *enabling* and *encouraging* strategies to cultivate children's self-regulation ability. We also suggest parents actively participating in co-use activity. This would not only benefit parent–child intimacy but also children's knowledge acquisition and critical thinking ability through communication and interaction with parents.

Summary, limitations and future work

This paper presented mixed-method research investigating parental perspectives on the use of emerging short-video apps in young Chinese children. The questionnaire results revealed that 83% of the young children had used short-video mobile apps before. Half of the children watched short videos on IQiyi, while 41% do so on Douyin. Children's frequently watched genres were toy reviews and animated stories. Most parents acknowledged both the educational and family intimacy values as well as the psychological risks of children's watching and tended to use restrictive mediation to regulate children's behavior.

Our results suggest that children and parents generally accepted short-video apps. Parents perceived short-video watching as a 'digital pacifier' to keep children quiet, a rich edutainment resource and a venue for shared parent–child activities, while children valued the aspects of entertainment and self-determination more highly. Platform designers and content producers should consider both parents' and children's needs when designing apps and short videos targeting young children. The

main parental concerns were screen time and inappropriate content, such as those considered to be vulgar and not 'positive' enough, rather than commercial persuasiveness and other potential long-term impacts on healthy lifestyles.

As an exploratory study, we had a small sample of participants for questionnaire analysis. Our in-depth interviews provided complimentary understanding of parents' attitudes and behaviors. We acknowledged that we excluded a group of young children who lived with grandparents. We need to be cautious in interpreting the results. Moreover, our study explored children's use from parental perspectives, and mostly focused on children's viewing of short videos rather than the shooting, making, and sharing of short videos. Future research could be conducted in this direction. Overall, our work contributes to knowledge of the use of short-video apps in early childhood and the underlying factors that influence children and parents' choices. We offer potential strategies for platform designers, policy makers and parents/caregivers for creating a vibrant and trustworthy media environment for young children.

Notes

1. Children were encouraged to stay with their parents so as they could correct or add any comments. All children who were voluntary to participate provided verbal assent and their guardian provided written consent.
2. We asked the candidates about their SES before the formal interview.

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