A Developmental View on Digital Vulnerability and Agency of Children Under 10 Years of Age

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Introduction

The continuously growing role of digital devices in today's society infuses the lives of families and their children with digital communication, learning and playing, and services. Family, peer, and educational interactions with digital technologies (DT) influence children from an early age. During the initial phase of the COVID-19 pandemic (2020–2022),

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H. Holmarsdottir et al. (eds.), *Understanding The Everyday Digital Lives of Children and Young People*, https://doi.org/10.1007/978-3-031-46929-9_7

numerous studies signalled changes in the cognitive and emotional development and social integration of children and young people due to the influence of digital transformations (Helsper & Smahel, 2020; Hurwitz & Schmitt, 2020; Lafton et al., 2023; Neophytou et al., 2021; Odgers et al., 2020).

Several studies have examined how DT may affect children's cognitive, emotional, and social development, potentially endangering their well-being, safety, educational attainment, and future career and social lives. Many studies considered the length of time spent using DT as a risk factor and often signalled negative consequences for the neurologic and socioemotional development of children (Bohnert & Gracia, 2021; Goagoses et al., 2020; Hollis et al., 2020; Robidoux et al., 2019; Sharpe, 2021; Suhana, 2017). Risks to children also relate to accessing inadequate or inaccurate content for their capacity to understand and include content, such as pornographic or negative messages, that might disturb or upset them (Sprung et al., 2020; Stoilova et al., 2021; Tiwari, 2020).

Despite numerous alarming headlines and research examining the potential risks of DT to children's health and development, few studies considered—in a holistic way—the combination of numerous risk and protective factors influencing the effects of DT on children's vulnerabilities (Lafton et al., 2023). Thus, in this chapter, we used a qualitative design to explore children's vulnerabilities as an interplay between children and caregivers and peers who interact with them, influencing their future as DT users during their life course (Elder, 1994; Mollborn et al., 2021). This is important as we recognise that 'instead of a battle with children on one side and parents on the other, media and technology use has become a family affair' (Wartella et al., 2014, p. 30).

In this chapter, we rely on the cultural constructivist view of Vygotsky (1978) on development regarding how mediation influences learning: 'Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first between people (inter-psychological), and then inside the child (intra-psychological)' (Vygotsky, 1978, p. 57). Focussing on preschool and elementary school children, we adopt the idea that for age-appropriate development, there are 'certain critical windows for age-related timing, offering optimal opportunities, as well as maximum risks' (Schoon & Heckhausen, 2019,

p. 4). The outcomes of risk factors depend not only on the ecosystemic factors that influence children, coming from family, school, and other social proximal or distal interactions, but also on children's agency, as affected by their age, motivation, and capacity to thrive and cope with adversity. The historical, social, and cultural conditions of children's lives are of great importance for what they learn, and the mediation they receive from parents and teachers is of great importance to how they develop (Vygotsky, 1934/1987, p. 148).

Children's Vulnerability and Agency from a Developmental Perspective

According to Masten and Gewirtz (2006), vulnerability is caused by existing predispositions and children's negative experiences. In their words, vulnerability is 'susceptibility to a particular disorder which was then potentiated by adverse experience' (Masten & Gewirtz, 2006, p. 22) and 'may arise over the course of development, from experiences that create susceptibility to future hazards' (Masten & Gewirtz, 2006, p. 24). Concisely, vulnerability is the 'susceptibility to a specified negative outcome in the context of risk and adversity' (Masten & Gewirtz, 2006, p. 24). Thus, in the digital world, we understand vulnerability in the context of negative experiences, risks, or adversity through the use of DT. The theoretical framework of vulnerability has an integratory capacity, explaining individual reactivity in many domains, including developmental psychology (Masten, 2018; Sroufe, 1996), child protection (Fraser et al., 2010), and recently the digital vulnerability of children (Ayllón et al., 2023). Based on Masten and Gewirtz (2006), resilience is the successful adaptation of highly vulnerable individuals facing adversities in their lives. According to the view of vulnerability and resilience, children do not interact passively with adversities in their environment, but from an early age, they are active agents who can compensate for vulnerabilities and develop coping mechanisms to overcome challenges.

To describe different forms of vulnerabilities, for this chapter, we adapted the taxonomy developed by Katz and El Asam (2020), which can

be linked with the ecological framework (Bronfenbrenner, 1979). In his later work, Bronfenbrenner defined (Bronfenbrenner & Ceci, 1994) the proximal processes, involving direct forms of interaction such as playing with a child, reading, or teaching new skills such as the use of DT 'through which genotypes are transformed into phenotypes' (Bronfenbrenner & Ceci, 1994, p. 568). Thus, for these researchers, the synergy effects between genetics and the environment surrounding children and young people are fundamental in the *proximal process*. Moreover, 'the nature of the emergent phenotypes will depend on the activities that take place in the principal proximal settings in which the child is growing up' (Bronfenbrenner & Ceci, 1994, p. 576). Through engaging in various digital activities, children and young people can make sense of the world around them and understand their place in it, simultaneously playing their part in changing the current order and fitting into the existing one. Thus, we analysed vulnerabilities regarding DT in a general sense, which is influenced by children's *age* range; *categorical*, characterised children belonging to the same socio-economic categories; *situational* influenced by children in a specific way depending on their microsystemic situation; and *individual*, which depends on children's reactions to challenges. This chapter explores how young children (aged 10 or younger) can overcome vulnerabilities triggered by DT, counteracting challenges through their agency.

Even though children today are considered capable of easily using DT, they are more vulnerable than adults to the hidden complexities of the digital world. From the point of view of neurological and psychological development, studies have pointed out that DT can be a leading stressor for the mental health of children aged 10 or younger because they do not have the capability to sufficiently regulate their psychological processes (Neophytou et al., 2021) or select appropriate content (Hollis et al., 2020; Livingstone, 2013). The risks for young generations are considered to exceed the risks faced by their parents, who were also highly influenced by digitalisation as their childhoods and adolescence were also influenced by computers, gaming, play stations, mobile phones, and later, mobile phones and social media (Neophytou et al., 2021). Children's well-being largely depends on their caregivers' capacity to respond to their cognitive, social, and emotional needs (Fineman, 2008), but concerning DT,

children's digital competences can sometimes surpass those of some of their caretakers, and children can also facilitate the access of adult caretakers to the opportunities accessible via DT. In this regard, the phenomenon of *reverse mediation* (Benedetto & Ingrassia, 2020; Nikken & Opree, 2018), which renders authority to children, can be a further consequence of the digital gap between some children and their caregivers.

Besides the general vulnerability related to their age, children and young people may be affected by sociodemographic factors, like low family income, living in a disadvantaged community, having a single parent, migration to new environments and cultures, or their parents' low education level. Such risk factors could cause categorical vulnerabilities due to specific disadvantages for children in accessing DT and developing digital competence. Referring to the parallel between online and offline vulnerability, Katz and El Asam (2020) noted that real-world vulnerabilities often extend to the online world.

Alongside categorical vulnerabilities, children live in specific situations that can induce vulnerabilities in their digital attainment. In our understanding, these relate to situational vulnerabilities and are context-specific issues (Kapella et al., 2022), like being neglected by their caregivers, adults, or peers; parental divorce; being left behind by parents migrating for labour; or being raised in foster care. The implicit risks of these situations need to be uncovered by analysis.

Innate characteristics like disabilities, developmental delays, or mental health issues might affect children's relationship with DT and their ability to use digital devices to grow and thrive. Thus, children might also have physical, emotional, or mental health characteristics, disorders, and special needs, representing individual vulnerabilities related to DT. Digital vulnerabilities in a psychological and psychiatric framework are often discussed in terms of the danger that children and young people—with or without personality or developmental disorders—will become addicted to excessively using devices and suffer the effects of their dependence (Odgers et al., 2020).

Within the developmental view of vulnerability, one fundamental approach is to discuss the vulnerability in relation to agency and evolving capabilities. General, categorical, situational, or individual vulnerabilities cannot by themselves make children vulnerable; in this perspective,

children are active agents who can revert the effect of risks according to their interests, needs, and goals in adaptative ways, even if not necessarily or entirely in the way adults might see it desirable from a parental or sometimes moral perspective. Agency is an essential term in understanding childhood (Duncan et al., 2018), underlining the transformative capacity of children (Baraldi & Cockburn, 2018). We also understand that children's actions, including those linked to digital devices, are co-agentic (Leonard, 2016) because children's reactions depend on the actions of those surrounding them, with whom they are connected in multiple ways and areas. Thus, an investigation of the agency and resilience of children in the digital world would benefit from exploring parents' attitudes and the parental role in facilitating or limiting children's access to DT and digital literacy.

Caregiver Mediation Styles and Children's Digital Exploration

DT enables new forms of access to information, opens new opportunities, and boosts learning capacities for children while also anchoring them in their communities and increasing their chances and productivity in the labour market (O'Neill, 2015). Children's engagement with DT should not be judged solely based on time spent using DT but also on the quality of the interaction. Children must learn to identify and respond critically to age-appropriate, relevant information. In the digital environment, children have the right to enjoy opportunities appropriate for their age and individual interest and to be protected from risks by being guided in their endeavours by more knowledgeable persons and programmes specifically designed for their age. According to Lazonder et al. (2020), children's level of DT use constantly increases throughout primary school, even without formal training. On the other hand, from the cultural constructivist approach to development, acquisitions result from social interactions, even if not formal competence, and become meaningful if the learners are active, critical, and creative. According to Vygotsky (1934/1987), who originated this framework, this can only be achieved

by the interactions and mediation from the social and cultural context (McDevitt & Ormrod, 2014). Cultural constructivism does not deny children's agency but posits that they need mediation to reach their potential. Such support and guidance play a role in scaffolding children's capabilities and come from people—either adults or peers—more knowledgeable than the child, explaining the differences between children's attainments (Kucirkova, 2017).

Thus, the cultural constructivist approach to digital competence captures the idea of mediation as empowering children to use DT, programmes, and platforms to grow cognitively, socially, and emotionally. Setting rules in the family reflects general parenting styles of controlling or allowing more freedom for children, as described by Baumrind (1967) and Maccoby and Martin (1983), but when DT is involved, specific goals depend on parental experiences, beliefs, and competences regarding the digital world (Roubinov & Boyce, 2017). Parental mediation refers to 'the diverse practices through which parents try to manage and regulate their children's experiences with the media' (Livingstone et al., 2015, p. 7). The term parental mediation originates from the work of Baumrind (1967, 2013), who described three parental mediation styles, depending on the degree of warmth and control demonstrated by parents. Baumrind had shown that children became (1) more responsible if parents were loving, demanding but rationale (authoritative style); (2) discontent, anxious, and less independent when parents were less emotionally involved and more controlling (authoritarian style); and (3) least responsible and unsatisfied were children of noncontrolling parents. As research data accumulated, the third parenting style was divided into permissive (but warm) and neglectful (non-involved) styles. In this chapter, we use the term parental mediation referring to the mediation styles developed based on the observations of family dynamics regarding DT and described by Lorenz and Kapella (2020), based on five categories of mediation. All five styles refer to parental involvement, even though the degree of warmth and the chosen strategies differ.

1. Restrictive mediation: general restrictions like screen time limits or restricted content and software.

2. Mediation through monitoring: parents monitor children's digital activities—for example through being present or active after children's use.
3. Active mediation: actively discussing, negotiating, and explaining DT to help children to understand DT.
4. Mediation through co-use: using DT together—for example looking for information on the Internet or gaming together.
5. Active distraction: engaging in more positively connoted strategies such as suggesting alternative non-digital activities rather than setting restrictions.

Caretakers' regulations and mediation styles influence children's use of DT and their developmental outcomes, and the caretakers may move between the different mediation styles depending on other contextual factors. Technology itself cannot be rated either negative or positive; its effects can be observed in children's play, health, learning, cognitive, emotional, social, and identity development and depend on a large constellation of influences from caregivers, educators, and peers that act over time and are moderated by children's actions and reactions to technology.

Objectives and Research Questions

Based on the developmental framework and concepts, we considered children's and parents' perceptions of risks and opportunities created by using DT at preschool and primary school ages crucial for understanding the controversy between children's vulnerabilities and competences. Thus, we explore how family members handle fear caused by children's use of DT. We wanted to analyse parents' and children's narratives, understand parents' views of DT, and determine how negotiations with children can support digital competence development.

One theoretical objective of this chapter is to identify general (age-related), categorical, situational, and individual vulnerabilities in children's use of DT and their reflections on children's and caretakers' accounts. Adding the cultural constructivist developmental theory of Vygotsky to the ecological perspective that grounds the work in this

chapter, we also attempt to analyse the role of parenting mediation on children's development regarding digital behaviour. The practical objectives of this chapter are: (a) to identify how parents perceive the risks of DT and the mediational styles they adopt; and (b) to scrutinise the views of children aged 5–6 years and primary school children aged 8–10 years about DT, including if and how they perceive risks and mobilise their agency to reach their goals in the digital world.

These objectives led to our research questions: (1) How do adult family members understand their role as mediators between the children and DT? (2) Do children reflect on their online vulnerabilities, and can these reflections be linked to contextual factors like family demographics, position in family and peer groups, and individual characteristics? and (3) Can we identify examples of children's digital agency in relation to family and social contexts regarding their digital behaviour.

Methodology

For this chapter, we used data from 31 family interviews with children and 2 of their family members and from 31 focus group interviews with 124 children from Austria, Romania, and Norway (see Kapella & Sisask, 2022; Kapella et al., 2022 for more details). The chapter is based on interviews with children in two age groups: 5–6 and 8–10. Data were collected between October 2020 and May 2021, with researchers being obliged to respect health regulations due to the COVID-19 pandemic and seeking to cover the largest possible variance in the social situations of families.

The methods used were designed to increase children's comfort during the interview and their interaction with the field researcher. Children and two adult family members were interviewed in their homes, with a few interviews conducted via DT (Zoom or WhatsApp). Children were interviewed individually or with their family members by their side, depending on the children's wishes. In the focus groups, we recruited children who already knew each other through school, kindergarten, or other social areas. Because the field research period overlapped with a COVID-19 lockdown period, focus group interviews sometimes took

place in children's homes but mostly in educational institutions (when open). Working with young children and their families was exciting and sometimes challenging for the researchers due to differences in the willingness of families to accept direct interactions with researchers during the pandemic and depending on the conditions where the interview took place. The use of information cards, consent sheets, and assent processes for children facilitated communication between field researchers and the children and their caretakers. Finding a proper, quiet space where interviews could occur was an issue for several families, especially in Romania, due to small homes and educational institutions. By respecting safety issues and regulations, researchers avoided all health risks.

Interviews were implemented with specially designed situation cards with drawings representing children using DT in different circumstances (e.g., a child playing on a smartphone while hiding under a sheet in bed), which stimulated the interview process with individuals and groups of children (for more details, see Kapella & Sisask, 2022; Kapella et al., 2022). Similar to working with vignettes (Barter & Renold, 2000) and drawings (Einarsdottir et al., 2009), showcards proved their usefulness as both icebreakers and instruments that stimulated in-depth conversations. An important advantage of using the showcards with children was that they expressed the essence of the research questions, pointing to children's experiences in using the technology and the usefulness and risks of DT in different aspects of life, especially in child–parent or child–caregiver interactions, in different family situations (e.g., bedtime, dinnertime, play). Field researchers also facilitated communication with children by engaging them in role-playing games, which contributed to creating a joyful experience for focus group participants.

Slightly more boys (n = 79) were recruited than girls (n = 75). Families were recruited based on a snowball technique, with the goal of recruiting participants from different social and cultural backgrounds. For individual interviews and focus groups, researchers invited children and family members from larger or smaller urban localities and rural communities, with different socio-economic statuses, and with variations in the digital competence of parents, from those with a university degree (including some with an information technology specialisation) to those with low education and low to very low digital competence. In our sample, we

included large families (with more than three children), families from minority (including some living in impoverished Roma communities in Romania), and multiethnic backgrounds, transnational families, families with divorced parents, and two-parent and single-parent families, sometimes complemented by aunts or grandparents. The sample did not include children with special needs in their developmental trajectories.

The interviews with children and focus groups were conducted and transcribed in the language of the interviewees and the resulting documents were analysed with NVivo, separately in Austria, Norway, and Romania, according to common topics determined by the researchers using thematic analysis. Given that the study involved a qualitative exploratory approach, we selected cases and situations that might be relevant for understanding the relations between adversities affecting children and their agency to overcome vulnerabilities. Since poverty is a significant factor that entails reduced access to DT and low levels of digital literacy among children and adults, we especially looked at the interaction of material deprivation, minority status, and the agency of children.

The education level of parents was noted on the family's observation sheet. We did not have information about the parents' education level of the children participating in focus groups. As a result, we cannot draw firm conclusions linking parental style with parents' educational levels. The introductory questions evaluated children's knowledge of DT, and declarative information was collected about what children can do with the gadgets we presented. All researchers followed the same protocol to ensure a similar procedure in collecting and analysing the data. Each national team analysed its data based on theoretical and methodological memos, interview transcriptions, and templates for results (for more information, see Kapella et al., 2022). All national teams met monthly to discuss trends and findings during data collection and analyses. Recurring themes identified in the national analysis and discussed in the meetings included vulnerability, parental mediation, and children's agency. To achieve cross-national insight, the authors of this chapter revisited the national data to write this chapter. We deliberately searched for how parents and children described parental mediation and risks regarding DT, children's vulnerability, and children's agency. Some similarities and differences emerged, in line with how Bronfenbrenner presented processes

of human development and noted that this process can be explained by the connection between aspects of the context (e.g., culture or social class) or individual (e.g., gender) and an outcome of interest (Bronfenbrenner, 1979).

For quotations in the results section, boys are indicated by the letter B and girls by the letter G, and their age is noted. Family interviews are marked Fam, focus groups are marked FG, and interview operators are labelled with the letter I for family interviews and the letter M for focus group discussions. Countries of origin are marked with At (Austria), No for Norway (No), and Ro for Romania. Adult family members' kinship is specified, along with the gender and age of the child. The quotations cover various families' socio-economic situations, composition, and urban or rural residence, but we have not been able to use these factors to show how they affect parental mediation in general given the small sample sizes in the country data.

The COVID-19 pandemic highly influenced the data collection period, but it also allowed the opportunity to explore in the family interviews how digital technology was used among all family members during a time of increased use. In addition, the pandemic influenced the family rules for handling DT to prevent children from being left behind in school tasks and ensure they maintained connections with peers and family members outside of the home. We kept these issues in mind when analysing the material.

Results

Our analysis shows that children's attitudes towards DT differed widely; many had a great interest in using devices, whereas others were very excited to explain how they adored DT. Through the interviews, children explained how they often experienced barriers or disadvantages. Such barriers included not having access to DT or restrictions set by their caregivers, but the children did not always have clear concepts of these barriers. The children also expressed how they usually listened to the warnings of their caregivers regarding the dangers of DT alongside encouragement to develop new skills. Besides many personal and age characteristics, their

reactions depended on how they understood norms set and mediated for them by their caregivers.

Children and their parents mentioned entertainment in their leisure time as the main purpose of DT for both age groups. 'Having fun' involved being able to operate a computer mouse, keyboard, and touchscreen, often before age 5. Many children did not have their own devices and used those of their family members. Children aged 5–6 watched videos on YouTube, meaning they did not interact with the online content. However, at this age, they began to solve simple problems and learn how to find preferred video games and cartoons on smartphones or tablets. The participating children aged 5–6 said they prefer in-person interactions and games they can play together with friends and their parents. These younger children seldom had access to social media or other platforms for communication online, meaning they rarely had contact with friends via social media. When accessing the devices of parents or older siblings, they were allowed to join in community games, like Pokémon GO.

In the interviewed families, children aged 8–10 were much more likely to have their own devices, like tablets, smartphones, or even laptops, and they were more regular users of DT, though most of their digital activities involved entertainment. Depending on their devices and parents' beliefs and practices, some children only had access to offline digital devices. In contrast, others also seemed to have access to an online world through gaming online with friends, 'Googling information' (NO-child-age-8), or watching YouTube or TikTok videos. Children in this age group preferred games like Minecraft, Among Us, World of Tanks, Fortnite, and Roblox. They also used Internet-connected devices for communication, although whether they used in-game communication differed by country. In some areas, they preferred to play games in the same place as their friends, whereas in others, they gamed together and communicated via platforms like Teams or Discord.

Universal Vulnerabilities and Parental Mediation

Due to their awareness of children's attraction to DT and age-related vulnerabilities, most parents noted their responsibility for setting rules

that limit children's access to DT, according to what seems like generally accepted social and cultural views of hazards. Aiming to protect their children, parents allowed or imposed rules regarding DT use. Generally, children's caretakers expressed worry about the dangers of DT that can affect their children aged 10 or younger. Their worries were rooted in the time spent on platforms like YouTube and gaming and inappropriate content their children might be accessing.

The children also mentioned health risks related to their eyes and mental health—specifically, the danger of 'getting dumb'. School-age children had more knowledge of risks than younger children. They mentioned too much distraction from school-related work, being unable to think of alternative activities, turning their routine upside down, forgetting to sleep and eat, and being tired during the day. When analysing data from the family interviews, we noted how children mirrored the parental discourses about worries. Children, however, clearly stated that they understood the necessity of rules, even if they rebel and strategise against parental control of their online behaviour.

To regulate children's digital activities, caregivers developed rules according to their parental styles (Kapella et al., 2022). Following Kohlberg's (Kohlberg, 1984) conception of moral development, children below age 7 are at the pre-conventional stage of moral development, and their reasoning is based on the logic of reward and punishment they perceive from their parents. In our data, we found that at age 5, children understand and can follow the rules, understand the difference between their views and the views of others about DT, and can perceive people's intentions. To a large extent, children aged 5–6 internalised the risks noted by their parents.

AT-FG-G6: Too much screen time leads to square eyes. … I like the tablet, I like it, but not so much, because of course, I don't want to get bad eyes. But I also eat carrots, so, it is somehow in the middle.

I: Ah, you eat carrots for your eyes, so they won't get bad.

AT-FG-G6: Yes, bad—well, lazy, like rotten milk or cheese. Yes, lazy eyes. Like my dad.

Children aged 5–6 expressed respect for the rules their parents imposed on them. They seemed very much aware that they depended on their parents for accessing DT and interiorised that their access was limited due to their age:

> When I grow up, [around age] 18, … my mother will let me play with the tablet. That is when she will buy me one. (RO-FG-B6)
>
> Mom doesn't allow me to watch videos on YouTube and yells at me if she sees me, but I like to watch funny videos. (RO-Fam-G6)

As indicated in this last quote, the child understands the parental rule but also notes that what they like may differ from what their parents want them to do. Even in early preschool ages, children might observe that different authorities apply different rules:

> Yes, I am sometimes sad when we watch TV, then we ask my dad and we want to watch another episode, but we are not allowed then. And sometimes I get angry. Mum does not allow it. She only says that it's very late already (the 9-year-old elder sister of the interviewed 5-year-old child, AT-Fam-G5-Sister)

Children older than 7 said they try to conform to the rules to win acceptance and approval from adults and are sometimes intimidated by their authority.

> M: Why don't you play [with digital devices] during dinner time?
>
> RO-FG-B9: Because dad argues with me and I am afraid of him, because he is bigger, and I am smaller.

Children aged 8–10, to a larger extent, expressed that they understand that rules are intended for their safety and often acknowledged that using DT has risks for them, internalising what they hear from their caregivers without questioning the arguments behind the statement:

> You can ruin your eyes. (RO-FG-G8)
>
> When I am not allowed any more time on the phone, I put it down. (RO-Fam-G8)

Children aged 8–10 said they could also become more argumentative, confronting their parents when they are determined to watch content according to their preferences:

> We used to argue because they were telling me to watch other YouTubers. But they don't understand that the YouTuber I'm watching interests me. (RO-FG-B8)

In all countries, a picture card illustrating a dinner table where one family member had a phone generated insight into how children experienced rules that are not definite; they may look different for them than for their parents. Some parents also talked about using the phone at the table but noted that it is often related to work. They also recognised this as a challenge and that by doing this, they were not necessarily 'good role models' (NO-Fam8-father). Some children explained that their father uses his phone to play games while eating dinner (NO-Fam-G6) or their mother always has her phone on the table (RO-FG-G8).

> My dad often uses his phone at the table … but that is how it is for adults. (NO-Fam-B9)

Children demonstrated awareness of different perspectives and how their parents differed from them. As for children's reflections on their age-related vulnerability, we found indications that they viewed themselves as unequal in their DT access and less privileged than adults. Preschool and primary school children expressed awareness that adults are allowed to use DT according to their interests, for a longer time, with different content and apps, and in situations not allowed for children (e.g., at the dinner table), with the right to make independent decisions regarding their use. In this way, children experience themselves as underprivileged compared to adults. Both kindergarten and primary school children considered these differences unfair, commenting critically about their parents' behaviour. For example, a kindergartener said she is not allowed to follow what she considers interesting, with her grandmother (her caregiver) using her superior position to validate her opinion:

> Sometimes grandma comes and says: 'Why are you looking at this stupid video?' and right then she's shutting down the computer or taking away the phone. I tell her it's interesting to me, but she won't let me, and if I talk a lot, she punishes me by not letting me have the phone at all that day. (RO-FG-G8)

In this example, the caretaker does not justify her rules but enforces them for the child's safety, considering it self-explanatory. Another observation indicated the distance between children's and their caregivers' interest in DT, such that parents try to regulate children's behaviour without knowing what they are doing:

> I think our parents do not know what Roblox is. They do not know that if we are in Roblox and want to explore games that they tell us not to play due to age limits [he already explained how his parents follow the age limits when it comes to gaming], then they do not understand that we can just find that game on Roblox and play it. (NO-FG-B9)

Regarding their interest in DT and limited ability to make decisions due to their age, children aged 8–10 in such families said they can take advantage of their parents' limited gaming knowledge and exploit their benevolence to find solutions to achieve their goals. Parents were mindful of risks that can harm children, such as spending too much time in front of screens, gaming excessively, or getting involved with strangers online. Children also mentioned health risks related to staring at screens for too long. They noted the risks of addiction in relation to games or digital activities they like 'too much' (NO-FG-B9).

Categorical Vulnerabilities Related to Sociodemographic Factors

In general, demographic factors varied greatly among these families in terms of access to technology, devices, and modes of connectivity and use, depending on their country, school system, socio-economic situation, type of family, education level of the parents, and position of the child in the family in relation to parents and siblings. For instance,

research shows that access to DT in the Norwegian and Austrian contexts was less challenging than in Romania (Ayllón et al., 2020).

Most families we interviewed in Norway, Austria, and Romania had several devices, and children had access to between three and eight devices and several related applications. In Romanian families with more than one child, sharing necessitated negotiations, even if the number of devices was sufficient from the parent's perspective. Many children also shared with us that they prefer mobile phones as they have more functions than tablets. As a Romanian mother explained:

> We have too many devices. Some we don't even use anymore. There are two tablets that the children no longer use. They prefer to argue over the phone rather than to take the tablet. (RO-Fam8-M).

In the Norwegian data, we found that children aged 5–6 already showed great interest in DT and that the range of devices, games, and applications to which they have access was notable. These children mainly described using their own devices (a tablet or Nintendo Switch); sometimes, they shared it with their siblings and, to a lesser degree, with their parents. In the Norwegian context, the range of devices used by children aged 8–10 was much more extensive.

The Norwegian school system also provided technological support; therefore, school-age children reported performing specific digital activities on devices they owned, their parents owned, or their school provided. For example, a 9-year-old-child went to a school that provided a Chromebook laptop, and the parents confirmed they had many digital devices in the family. Other children were enrolled in an *iPad school*, where each child received an iPad from the school. A clear division emerged between devices for children in this age group, with iPads, tablets, and mobile phones used for free time and to relax, but a Chromebook or laptop used for school. Some participants noted a clear distinction between tablets belonging to their school and tablets belonging to them and their families, as mentioned in several focus groups and family interviews.

> I never use it [the tablets] during the weekend. (NO-Fam-G9)

> I do have my own tablet. And a computer, but the computer is only for schoolwork. (NO-Fam-B9)
>
> I have an iPad, Chromebook, and a mobile phone. … The iPad I see when I am at home, and the Chromebook there I got from school and I use that at school or for schoolwork, while the phone is always handy in my pocket. (NO-Fam-B9)

Categorical Vulnerabilities

Despite the generally well-equipped participants in all three participating countries regarding DT, not all children had their own devices, even for essential schoolwork. One-third of the Romanian families discussed the need to share devices, noting their average income and having several children enrolled in online schooling during the COVID-19 period. In such families, the lack of private space for children to take online classes and the need to share devices with their parents and siblings complicated parenting tasks. For example, a Romanian mother with two children (both parents worked online during the pandemic) disclosed the pressures they faced to accommodate the legitimate needs of all family members, who had to share two laptops and two mobile phones in a two-room apartment.

In the Roma community, we visited during the COVID-19 crisis, school children had low access to DT and the Internet. When the families we visited finally received the tablets purchased by the Romanian Ministry of Education, the school year was almost over, with severe consequences for the children's academic achievements in those communities. The interviews showed that children were aware of the opportunities of DT, the risks of not accessing such resources, and their need for DT to keep up with school and stay connected in a general sense.

> If I had a tablet, I wouldn't have had to repeat the school year. You can find a lot of useful information on the Internet. Nowadays, it is important to be connected to the Internet. (RO-Fam-G10)

In the Roma community, devices owned by families were shared and used by children, parents, and siblings. Especially during the pandemic,

parents shared their mobile phones with their school-age children and siblings had to share tablets or phones, which became vehicles of family solidarity. One Roma girl (age 9) not only shared a tablet with her 6-year-old sister but also tutored her because their mother (a single parent) had little education and limited digital skills. In another case, a Roma boy (age 9) used a phone to keep in contact with his teacher and peers, sharing the device with his stepmother, for whom the phone was essential to keep in contact with her husband, who migrated for work. The boy also used the phone to entertain his 3-year-old stepbrother. Differences in children's and their parent's interest in digital entertainment also complicated the negotiations in these families. Difficulty accessing electricity to charge the devices or repairing dysfunctional devices also served as barriers to developing age-appropriate digital competencies that could support educational children's education.

While we do not have enough data to suggest that parental education and lack of digital skills affect parental mediation styles, especially in the Romanian case, we might consider if this could have some influence on parental mediation, such as active mediation versus more restrictive mediation. Mediation styles are closely related to rule-setting and while some parents may make decisions without consulting their children, others, like this father from Romania, show that children's input is also important:

> When rules are established, they are discussed together with the children. The children's opinion matters, and we take it into account. We noticed that if you value their opinion, they can easily respect certain rules. This way there are no conflicts. (RO-Fam-B8-F)

Likewise, in the Norwegian context, parents also consider their children when setting rules. Still, at the same time, they also recognise a need to be flexible and want to understand their children's digital lives:

> We talk a lot together. As parents, we do not necessarily have first-hand experiences either. It becomes important to know what they are involved in and discuss their online experiences with them. Strict rules about screen time will not do it, and I sometimes worry about children where parents

> only set rules without discussing the rules with the children. We have to relate to the digital the same way we relate to other areas of their life (NO-Fam-M)

These two examples highlight an active mediation parenting style where discussions, negotiation, and explanations are crucial to being a parent today. Parents in this category appeared to value rules and were preoccupied with reinforcing them. Still, they also understood the need to foster children's agency by creating opportunities for the child to participate in setting the rules for using devices. For these parents, dialogue and allowing room for their children to negotiate the rules and simultaneously engage with digital technology is an essential part of their family life.

> As a parent, it is important that I don't see the digital as something strange or different. It is a part of our everyday life, and we must be able to talk about it the same way we talk about what we eat. For instance, you can't eat candy all the time or game all the time. But you can eat healthy sweets, like fruit. As a mother, I also need to know what is healthy online, so I talk to my children about it. And I do not set those strict, clear lines about screen time. We can discuss them depending on what activities they are involved in. (NO-Fam-M)

Situational Vulnerabilities

Children's sense of identity and self-confidence depended on not only the influences of their families but also their position in their peer groups. In the interviews, children showed sensitivity when presented with images of peer groups excluding a child or only allowing one person to use a device (e.g., AT-Fam-G6). For both age groups, differences in digital competence and access to gaming or other everyday digital activities with peers and friends generated the feeling of being marginalised, negatively influencing children's well-being, similar to exclusion from offline peer activities.

For children aged 5–6, offline peer activities mattered more than digital ones, whereas for those aged 8–10, being excluded from online play with friends became frustrating and rendered them vulnerable. Lack of

digital experience in primary school in Austria led to feelings of being uninvolved in the culture and unable to follow the content of peer communication:

> M: What games you play?
> AT-B9: They [classmates] often talk about games, and I just don't know my way around these at all.
> AT-G9: Me too; they talk about Fortnite, Roblox, or—.
> AT-B9: I don't have anything to say at all, but I don't think that's so bad.
> AT-G9: I find it annoying sometimes because I have nothing to contribute.

In Romania, focus groups also revealed that having access to mobile phones and digital games is a status symbol for school children. They competed to show the researchers their nice phones and related gaming applications. In the same vein, not having a smartphone made a girl in primary school feel disadvantaged and marginalised in Austria:

> I wanted to play with my friends, but they only looked at their smartphones and ignored me. And I don't have a smartphone. And they didn't allow me to watch them play. (AT-FG-G9)

These children employed different strategies for dealing with their marginalisation in peer groups. On the one hand, they might give in to peer pressure, as reflected in the strategy of concealing their lack of knowledge or limited possibilities, like a girl in Austria (AT-FG-G9) who did not contribute to discussions about specific games. In contrast, a boy in the same country (AT-FG-B9) tried to contribute his basic knowledge, but it became apparent in the focus group interview that he was not as experienced in playing these games as another boy. Another Austrian girl (AT-FG7-G8) stayed relatively quiet, probably due to her limited knowledge about specific games and activities being discussed.

Some Romanian children in primary school pointed to the role of teachers in equalising the competence of children:

I: If you were to give yourself a grade, how well do you know how to use digital technologies?

RO-Fam-G10: Five [on a scale of 1–10, a little higher than a failing grade of 4]. … I would like to learn more about technologies and Google Classroom and Google Meet at school. I would like to know more about these applications because we use them at school. I think this information would be more useful than knowing what is inside a computer.

The girl graded herself not based on how many hours she spent online or what games she knew but on whether she knew how the applications worked and how to operate them was unclear. On the other hand, some children expressed a different view, like two boys in Austrian primary schools (AT-Fam-B4 and AT-FG-B3) who self-confidently admitted not being experienced in certain activities that others mentioned, representing critical and differentiated perspectives.

Siblings also interfered with the children's interactions with DT. During the COVID-19 pandemic, some children said several siblings complicated their access to the digital technology needed for schooling, especially in families with fewer resources. Older siblings also widened children's perspectives towards various platforms and programmes: as one boy from Romania (RO-Fam-B9) said he knows about Facebook, WhatsApp, TikTok, Spotify, Instagram, and smartwatches from his sister, whereas a girl from Romania (RO-Fam-G6) reported knowing about sound editing software from her brother:

M: What else can we use a laptop for, except for online school and watching YouTube?

RO-Fam-G6: We can make music with it using a particular program.

M: Create or listen to?

RO-Fam-G6: To create. My brother has a program named FL Studio and he uses it all the time. He likes music a lot, but my mother doesn't like what she hears.

Individual Vulnerabilities

Children responded to the challenges of DT in unique ways. They had distinctive reactions in adapting to the types of parenting styles and mediation, with some being more active and others being more compliant or passive. In their interactions with children, parents might become conscious of the risks of DT and observe the benefits of their children using it. These parents appreciated the contributions of DT to their children's intellectual development, for learning problem-solving strategies, understanding English, or learning to follow instructions. One of the fathers said:

> I see how both of them (his children) improve their English. I also find that they are actually developing in terms of how they relate to digital content. Our eldest son (9 years old) was playing this granny game and got really scared. But he came to us and talked about it and I think this is due to our openness. Our discussions contribute to how he relates to digital content and it stimulates his ethical awareness. I also see how gaming with his friends challenges him in problem-solving, both alone and together with peers (NO-Fam-F).

Parents who understood the benefits of DT also tended to acknowledge their children's joy in interacting with digital content. Depending on the perceived risks and benefits, but also their general parenting styles, parents might need to facilitate, restrict, or ignore children's use of DT, which could trigger different reactions among their children. Depending on their parenting style, some parents joined the same games as their children and knew about their children's digital activities. When their children abused their time with digital devices, they applied restrictions.

> I: Do you have rules for the use of technology?
>
> RO-Fam-G10: No, I can stay as long as I want. But if one day I don't do anything for school, my mother punishes me and doesn't let me on the phone. But this rarely happens.

A majority of the parents also underline the need to do homework first. A Norwegian father tells us:

> unimportant things. And I think my parents should have told me not to. So I make sure to tell my children 'homework first'. Then they can do other on-screen activities (NO-Fam-F).

How parents accommodated their children's needs and views, listening to what they have to say while establishing rules differed between families and countries. Regarding children's reactions to these rules, they had some capability to demonstrate their agency in responding to the rules. Yet, for some children, an adequate response meant being compliant.

> M: Who made these rules? Your mom? Your dad? Or both of them?
> RO-Fam-G8: Both.
> M: And do you follow them?
> RO-Fam-G8: When I am not allowed anymore on the phone, I put it down.
> M: And what are the rules? Do you have a limited time?
> RO-Fam-G8: No, only when I start twitching [probably meaning having a tantrum]. But if I don't have any and I behave well, they don't take it [smartphone] away from me. (RO-Fam-G8)

Children related to rules and restrictions and pursued agency in diverse ways. Mediation styles in less restrictive and more flexible families gave children space to manoeuvre and develop strategies to overcome parental rules. In contrast, children found ways to escape the rules in families with more restricted access to DT. In a focus group, one girl described how her older brother 'needs screen time because he loves gaming so much, which is why he must go to a friend. He is not allowed to do it at home' (NO-G6).

Such strategies of overcoming the rules seemed important for children to be part of their peer culture. Children also noticed each other's digital behaviour, with their similarities and differences. One boy talked about a friend in kindergarten 'who wishes to have the same game as him and to

play with the same character, with the same skin, in the same game as he does' (NO-B5), so they can really play together.

These examples show how children reflected on differences among themselves, siblings, parents, and peers regarding different rules. Children were affected differently by their family background and parents' views on their digital well-being, which affected the extent to which they benefited from or were negatively affected by DT and pushed into a vulnerable position.

With competences learned from school or peers, children can establish their own ways of dealing with DT and teach their parents to operate DT. In the Romanian sample, four such cases occurred—two in the Roma community and two in families with divorced or single mothers (RO-F1, RO-F2, RO-F6, RO-F11). The rules established in these families were governed by the oldest child, who oversaw technical support for younger children (for schooling) but also for the parents. Thus, lacking the knowledge that would enable them to use DT, parents turned to their children for guidance in the digital world. This form of family dynamics shows children's capacity to adapt to challenges resiliently, supporting their family, strengthening their position among family members, and contributing to their development.

Children also demonstrated their agency through the resourceful ways they reacted to rules, such as in a focus group in Romania during which children told the field researcher that they have the means to make parents renounce a punishment:

RO-G9: I'm waiting for the sentence to pass.
RO-B9: Sometimes I wait; sometimes I start to cry.
M: And with crying, do you still have a chance to negotiate?
RO-G9: If the punishment is daylong, then I must cry for an hour.
RO-G9: Every time my mother sees that I'm upset, or I cry, she gives me the phone.
M: Do you know that this is blackmailing your parents?
Several girls: Yes, yes, yes, sometimes! (RO-FG-8-10 years)

In one of the Norwegian focus groups the children discussed how they navigated when parents added restrictions to their Internet use.

> NO-B9: You know my father, he has put this parental control on our Internet. But he had to Google it to understand how to do it. And I don't think he understands that if he can Google how to put it on, then I can Google how to take it out (NO-FG-B9).

Furthermore, Roma children in primary school living in an impoverished community showed the capacity to act responsibly and in solidarity with their family members. For example, a Roma boy acquired digital skills from his peers in schools during the COVID-19 lockdown. Having received a tablet from school for online learning, he guided her mother to get online counselling and support in a domestic violence situation, contacting the social worker and organising an online meeting for her. As shown in this example, children in disadvantaged families and communities demonstrated more expertise in digital literacy than their parents. Therefore, the digital competence of this child was valued and strengthened his position in the family.

Not all children demonstrated the capacity to overcome the limitations imposed by their parents to keep them safe, which might cause vulnerabilities like being excluded from peer groups, which we saw in two Austrian families (AT-Fam7 and AT-Fam2). This could also impede later development, especially if children lack the competence to integrate DT into their daily lives. On the other hand, children who can access digital activities and online content in a highly unrestricted and unmediated way could lack digital competence. They may experience harmful content online and develop risky (online) behaviour, even though they might gain extensive skills and knowledge.

Discussion

Our interviews with children and caregivers show that DT is part of *doing family* (Kapella et al., 2022), meaning how family members care about each other, interact, and manage their lives, whether in terms of communication, education, entertainment, or discipline. Our data show that children have leeway to react to their parent's rules and restrictions. As shown in the analysis, children from the age of 5 reflected on their

knowledge and competencies, being aware that their limitations can put them at risk. They often understood that limitations imposed by their parents might serve their own interests, even though, from a developmental perspective, they may have been too young to consider the perspectives of others. This indicates that children's general vulnerability, based on their age, should be considered alongside other factors.

Children aged 5–6 tended to accept the rules as formulated and mediated by their parents. On the other hand, they did not interact passively with adversities in their environment (Masten & Gewirtz, 2006); instead, they challenged or questioned the family's rules. However, we found that children aged 8–10 compensated more for their general vulnerability of being a child and developed coping mechanisms. These mechanisms seemed to be situational, and following Bronfenbrenner (2005), they depended on the child's microsystemic situation. The following discussion links the parental mediation style (Kapella et al., 2022) with children's vulnerability and agency.

In all interviews, children's knowledge about the risks of DT reflected the dominant discourse on the dangers of the Internet and the technologies needed to use it, as presented by older family members. Especially the youngest children mirrored their parents' discourses about risks and vulnerabilities. They expressed trust in their caregivers' capacity to respond to their needs (Fineman, 2008), and as demonstrated by several of the quotes from our results, the youngest children did not necessarily challenge their parents' competence in setting rules, even though they sometimes questioned why adults have different rules than them. As such, the youngest children seemed to accept a monitoring and restrictive parental style.

To a larger degree, the children aged 8–10 reflected on situations where they felt that the restrictive management of their access to DT by their parents was not justified. In some interviews, especially in families with a lower sociodemographic status, participants elaborated on how the parents' lack of digital competence influenced their parental style and the children's agency. Children in families with minimal access might be situationally vulnerable because their digital competence seems to be limited, although it might be better than that of their parents. Consequently, they might face exclusion in their peer group. These mechanisms of possible

exclusion, however, did trigger agentic strategies. Such strategies are exemplified by the boy who pretended to know a game he never played. Though his peers recognised this, they let him continue without revealing that they knew he does not know firsthand about the game. That suddenly raises other questions. Do his attempts to take part in the discussion make him more vulnerable? Or does such a strategy resist individual vulnerability through coping, underlining the transformative capacity of children (Baraldi & Cockburn, 2018)? Based on our data, we cannot answer this question. Still, we can call for discussions of how a restrictive parental style, developed to protect children from digital danger in a game, may lead to vulnerabilities in the child's interaction with peers.

On the other hand, this picture is not black and white; peers seem to care for each other and accept that they have different rules at home, at least for the age groups involved in our study. The example of the boy spending time at his friend's home to get more access to games shows how children act in a co-agentic fashion (Leonard, 2016). Even a younger sibling knew that the mission was to play games and get more screen access, demonstrating that children looked out for each other. The younger sibling did not tell, and the friend let the boy visit to ensure he had access to games. In this case, the parent's limitations and restrictive style allowed the child to connect with others surrounding him outside of the family's microsystem.

According to the analysis of parental styles, more restrictive attitudes might lead to digital vulnerabilities due to restricting children's digital literacy. Children seemed to trust their parents, but at the same time, they wanted to be included with their peers. One consequence of children going elsewhere to pursue their digital interests without their parents' involvement may be that their level of digital competence increases not only regarding family or school (Lazonder et al., 2020) but also with others who have more access to digital devices than them, but not necessarily with more competence. Other research suggests that this could be an effect of strict parental rules that do not permit enough DT use among children (Bărbuță et al., 2022; Kapella et al., 2022). Kapella et al. (2022) argued that overprotected children do not have a voice in their families and cannot negotiate their use of DT. We found these children generally

had weak voices, which caregivers do not hear, and something that can be seen as a general vulnerability.

Non-participation of children in decision-making—in this case, regarding DT use—represents a hierarchical and controlling parenting style, which Baumrind (1967) called authoritarian. On the other hand, more controlling parenting might be a good strategy for families with low resources, like how they can prevent children from taking risks in communities where they are exposed to more significant dangers and there are few protective resources (Roubinov & Boyce, 2017). Parents' values and digital knowledge may vary based on socio-economic status, shaping children's behaviour with DT.

In the Romanian sample, we detected children with self-declared digital competence in various families. Previous studies show the role of parental involvement and expectations for performance related to the parents' level of education and social capital (Davis-Kean, 2005) matter to children's digital competence. Still, when it comes to DT it seems that children's possibilities of following their interests and contributing to the family's digital life matter just as much. Parental styles that minimised the child's interest without necessarily knowing what they interact with on the screen also seemed to activate resistance in the child. At the same time, we found collaborative and attentive parenting attitudes and constructive negotiations with children for rules about using DT and who should have access to digital devices in families with low socio-economic status and education, including Roma families living in a deprived community. In such families, negotiating device time and space for home schooling was complicated but manageable by adults and children working together. This illustrates the concept of familism, meaning a family culture that promotes interdependence and attachment between family members and leads to adaptative outcomes for young people (Gonzales et al., 2013; Roubinov & Boyce, 2017). Still, the flexibility of the adult caretaker and children's agency cannot compensate for the lack of educational and technological support for the children, who showed resilience in overcoming socio-economic barriers but had difficulties keeping up with classmates. More than the number of devices owned or platforms and programmes used, the understanding of the value of the devices and

the *story* behind them revealed the capacity of children as active agents, resilient in the face of adversities.

As shown in this discussion, categorical vulnerability can change if children have access to social interactions that help them to become active, either as part of their family or in other microsystems, by strengthening the child through mediation from their social and cultural context (McDevitt & Ormrod, 2014). Whether or not families face financial difficulties ensuring their children have access to DT, they still need sufficient digital competence to find a parenting approach that helps children navigate DT safely. Of note, some children described how their friends supported them and scaffolded their possibilities when they lacked access at home. School as an arena for developing digital literacy or discussing digital content was seldom mentioned, even in the Norwegian setting where all children have access to DT through school. One Romanian boy did mention school but in terms of what he was missing. Even though parental styles depend on parental experiences and beliefs (Roubinov & Boyce, 2017), it seems necessary to discuss whether a restrictive parental style may also lead to greater vulnerability when children access digital content with very few adults nearby. Our findings show that these children were attracted to digital content and described learning a lot from YouTube and other online sources.

The in-depth analysis made it clear that in some families, vulnerability is shaped less by socio-economic status and family disadvantages and more by parental view*s* on DT and parenting styles. These parenting styles shape not only how children behave at home but also how they connect to other microsystems.

Conclusions

Children's vulnerability became visible through the lenses they use in their interactions with members in their family microsystems. From a constructivist perspective, the discussion problematises how children can actively or passively accept or deconstruct parental rules developed to protect and mediate their safety in the digital environment while following their interests.

The data collected show that children's digital development depends on how they manifest their agency concerning DT, which again comes back to the control they experienced, the autonomy gained, and the support received for developing competence.

Analysing caregivers' responses regarding their attitudes about children's use of DT revealed their preoccupations, fears, difficulties, and strategies in shaping their children's access to DT. Of the four areas of the digital environment (healthy practices, relationships, education, and digital play) mentioned by Mantilla and Edwards (2019), parents mainly discussed limiting time as a focal point for avoiding unhealthy practices and limiting access of children to social media, fearing contact with strangers. Our data also provided examples of parents recognising the potential value of DT for acquiring information and learning. Still, fewer parents shared with us an interest in promoting learning via DT to develop new digital competence for themselves or their children. Some showed an interest in joining their children in digital play and expressed an awareness of the importance of spending family time together, using the potential of the Internet and related. Others were more influenced by the dominant public discourse about the dangers of the digital world for vulnerable children and less about its potential benefits.

For the research question regarding how children's vulnerabilities appeared in the accounts we collected, we followed the vulnerabilities described by Katz and El Asam (2020); children feel vulnerable compared to adults, whom they perceive as having more rights. Due to more restrictions by parents and lower resources for the acquisition of digital devices compared to peers, disadvantaged children might feel vulnerable, be underestimated, and be excluded from peer groups. In families with low socio-economic status, low education levels, and especially Roma minority status (in the Romanian sample), offline vulnerabilities were reflected in children's accounts, who expressed that they struggle to keep up with their schoolmates. Gaps in access to DT, often presented in statistical data from Romania (Ayllón et al., 2020, 2023), were also acknowledged by some of the interviewed children, who expected more support from their school in developing digital literacy to help them overcome their marginalisation.

Regarding children's agency in relation to their family and social contexts, the in-depth analysis revealed that children have internal resources to strategies and adapt to a familial context that mediates their access to the digital world, which had already marked their young lives and might influence their future. In some families marked by poverty, the small number of devices and lack of guidance for children could be partly counterbalanced by children's agency. The parental capacity to negotiate and maintain boundaries could promote resilience among children and make them feel digitally competent. Still, in these cases, tutoring by educators would be necessary to avoid increasing existing digital divides (Ayllón et al., 2023). Although some interviewed children reported understanding and respecting family rules, other children reported that their parents were unaware of the programmes and platforms they used, allowing them to skirt the rules established for such activities. Children's strategies to avoid rules and follow their interest in DT became apparent in families with authoritarian, non-negotiable, and restrictive parenting styles. Children's agency in the context of using DT seemed to exceed their agency in other contexts, such as school learning, where children need more guidance on learning and do not have options, but this needs further exploration.

The qualitative analysis of children's and parents' views and experiences confirmed the contribution of the cultural constructivist framework to understanding children's agency. It showed that vulnerability in children's use of DT is shaped by the capacity of caretakers to mediate children's capacity to face the risks of the real and digital worlds. The importance of caregivers' guidance and mediation for children in the sample justifies the recommendation of UNESCO (Fau & Moreau, 2018) and the European Commission (2022) to promote digital literacy for all children and their parents.

References

Ayllón, S., Barbovschi, M., Casamassima, G., Drossel, K., Eickelmann, B., Gheţău, C., Haragus, T. P., Holmarsdottir, H. B., Hyggen, C., Kapella, O., Karatzogianni, A., Lado, S., Levine, D., Lorenz, T., Mifsud, L., Parsanoglou,

D., Port, S., Sisask, M., Symeonaki,, M, & Teidla-Kunitsõn, G. (2020). *ICT usage across Europe: A literature review and an overview of existing data*. https://www.digigen.eu/wp-content/uploads/2020/09/DigiGen_ICT-usage-across-Europe_a-literature-review-and-an-overview-of-existing-data.pdf

Ayllón, S., Holmarsdottir, H., & Lado, S. (2023). Digitally deprived children in Europe. *Child Indicators Research, 16*, 1315–1339. https://doi.org/10.1007/s12187-022-10006-w

Baraldi, C., & Cockburn, T. (2018). Introduction: Lived citizenship, rights and participation in contemporary Europe. In *Theorising childhood: Citizenship, rights and participation* (pp. 1–27). Springer.

Bărbuță, A., Roth, M., & Ghețău, C. (2022). Family dynamics during the Covid-19 pandemic: Mediating children's access to digital technologies. *Revista Romana de Sociologie, 33*(3–4), 181–204.

Barter, C., & Renold, E. (2000). 'I wanna tell you a story': Exploring the application of vignettes in qualitative research with children and young people. *International Journal of Social Research Methodology, 3*(4), 307–323. https://doi.org/10.1080/13645570050178594

Baumrind, D. (1967). Effects of authoritative parental control on child behavior. *Child Development, 37*, 887–907. https://doi.org/10.2307/1126611

Baumrind, D. (2013). Authoritative parenting revisited: History and current status. In R. E. Larzelere, A. S. Morris, & A. W. Harrist (Eds.), *Authoritative parenting: Synthesising nurturance and discipline for optimal child development* (pp. 11–34). American Psychological Association. https://doi.org/10.1037/13948-002

Benedetto, L., & Ingrassia, M. (2020). Digital parenting: Raising and protecting children in media world. In L. Benedetteo & M. Ingrassia (Eds.), *Parenting: Studies by an ecocultural and transactional perspective*. IntechOpen. https://doi.org/10.5772/intechopen.92579

Bohnert, M., & Gracia, P. (2021). Emerging digital generations? Impacts of child digital use on mental and socioemotional well-being across two cohorts in Ireland, 2007–2018. *Child Indicators Research, 14*(2), 629–659. https://doi.org/10.1007/s12187-020-09767-z

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press.

Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. Sage.

Bronfenbrenner, U., & Ceci, S. J. (1994). Nature-nurture reconceptualised in developmental perspective: A bioecological model. *Psychological Review, 101*(4), 568–586. https://doi.org/10.1037/0033-295X.101.4.568

Davis-Kean, P. E. (2005). The influence of parent education and family income on child achievement: The indirect role of parental expectations and the home environment. *Journal of Family Psychology, 19*(2), 294–304. https://doi.org/10.1037/0893-3200.19.2.294

Duncan, R. J., Schmitt, S. A., Burke, M., & McClelland, M. M. (2018). Combining a kindergarten readiness summer program with a self-regulation intervention improves school readiness. *Early Childhood Research Quarterly, 42*, 291–300. https://doi.org/10.1016/j.ecresq.2017.10.012

Einarsdottir, J., Dockett, S., & Perry, B. (2009). Making meaning: Children's perspectives expressed through drawings. *Early Child Development and Care, 179*(2), 217–232. https://doi.org/10.1080/03004430802666999

Elder, G. H., Jr. (1994). Time, human agency, and social change: Perspectives on the life course. *Social Psychology Quarterly, 57*(1), 4–15. https://www.jstor.org/stable/2786971

European Commission. (2022). *A European strategy for a better internet for kids*. https://digital-strategy.ec.europa.eu/en/policies/strategy-better-internet-kids.

Fau, S., & Moreau, Y. (2018). *Managing tomorrow's digital skills: What conclusions can we draw from international comparative indicators?* https://unesdoc.unesco.org/ark:/48223/pf0000261853.

Fineman, M. A. (2008). The vulnerable subject: Anchoring equality in the human condition. *Yale Journal of Law and Feminism, 20*(1), Article 8–40.

Fraser, J. A., Mathews, B., Walsh, K., Chen, L., & Dunne, M. (2010). Factors influencing child abuse and neglect recognition and reporting by nurses: A multivariate analysis. *International Journal of Nursing Studies, 47*(2), 146–153. https://doi.org/10.1016/j.ijnurstu.2009.05.015

Goagoses, N., Winschiers-Theophilus, H., & Chamunorwa, M. B. (2020). The (potential) role of technology for young children's social-emotional learning: During and beyond the COVID-19 pandemic. *Digital Government: Research and Practice, 2*(1), 1–6. https://doi.org/10.1145/3429986

Gonzales, R. G., Suárez-Orozco, C., & Dedios-Sanguineti, M. C. (2013). No place to belong: Contextualising concepts of mental health among undocumented immigrant youth in the United States. *American Behavioral Scientist, 57*(8), 1174–1199. https://doi.org/10.1177/0002764213487349

Helsper, E. J., & Smahel, D. (2020). Excessive internet use by young Europeans: Psychological vulnerability and digital literacy? *Information, Communication & Society, 23*(9), 1255–1273. https://doi.org/10.1080/1369118X.2018.1563203

Hollis, C., Livingstone, S., & Sonuga-Barke, E. (2020). Editorial: The role of digital technology in children and young people's mental health – a triple-edged sword? *Journal of Child Psychology and Psychiatry, 61*(8), 837–841. https://doi.org/10.1111/jcpp.13302

Hurwitz, L. B., & Schmitt, K. L. (2020). Can children benefit from early internet exposure? Short-and long-term links between internet use, digital skill, and academic performance. *Computers and Education, 146*. https://doi.org/10.1016/j.compedu.2019.103750

Kapella, O., & Sisask, M. (2022). *Country reports presenting the findings from the four case studies—Austria, Estonia, Norway, Romania*. DigiGen Working paper No. 6. doi:https://doi.org/10.6084/m9.figshare.19070090.

Kapella, O., Schmidt, E. M. & Vogl, S. (2022). *Integration of digital technologies in families with children aged 5–10 years: A synthesis report of four European country case studies*. (Digi Gen-working paper series No 8). COFACE Families Europe. doi:https://doi.org/10.5281/zenodo.6411126.

Katz, A., & El Asam, A. (2020). *Vulnerable children in a digital world*. https://www.internetmatters.org/pt/wp-content/uploads/2019/04/Internet-Matters-Report-Vulnerable-Children-in-a-Digital-World.pdf.

Kohlberg, L. (1984). *The psychology of moral development: The nature and validity of moral stages*. Harper & Row.

Kucirkova, N. (2017). *Digital personalisation in early childhood: Impact on childhood*. Bloomsbury Academic.

Lafton, T., Holmarsdottir, H. B., Kapella, O., Sisask, M., & Zinoveva, L. (2023). Children's vulnerability to digital technology within the family: A scoping review. *Societies, 13*, 11. https://doi.org/10.3390/soc13010011

Lazonder, A. W., Walraven, A., Gijlers, H., & Janssen, N. (2020). Longitudinal assessment of digital literacy in children: Findings from a large Dutch single-school study. *Computers and Education, 143*. https://doi.org/10.1016/j.compedu.2019.103681

Leonard, M. (2016). *The sociology of children, childhood and generation*. Sage.

Livingstone, S. (2013). Online risk, harm and vulnerability: Reflections on the evidence base for child Internet safety policy. *ZER. Journal of Communication Studies, 18*(35), 13–28. http://eprints.lse.ac.uk/id/eprint/62278

Livingstone, S., Mascheroni, G., Dreier, M., Chaudron, S., & Lagae, K. (2015). *How parents of young children manage digital devices at home: The role of income, education and parental style*. EU Kids Online.

Lorenz, T., & Kapella, O. (2020). *Children's ICT use and its impact on family life. A literature review*. DigiGen working paper nr 1. doi:https://doi.org/10.6084/m9.figshare.12587975.v1.

Maccoby, E. E., & Martin, J. (1983). Socialisation in the context of the family: Parent-child interaction. In E. M. Hetherington (Ed.), *Handbook of child psychology: Socialisation, personality, and social development* (Vol. 4, pp. 1–101). Wiley.

Mantilla, A., & Edwards, S. (2019). Digital technology use by and with young children: A systematic review for the Statement on Young Children and Digital Technologies. *Australasian Journal of Early Childhood, 44*(2), 182–195. https://doi.org/10.1177/1836939119832744

Masten, A. S. (2018). Resilience theory and research on children and families: Past, present, and promise. *Journal of Family Theory & Review, 10*(1), 12–31. https://doi.org/10.1111/jftr.12255

Masten, A. S., & Gewirtz, A. H. (2006). Vulnerability and resilience in early child development. In K. McCartney & D. Phillips (Eds.), *Blackwell handbook of early childhood development* (pp. 22–43). Blackwell. https://doi.org/10.1002/9780470757703.ch2

McDevitt, T. M., & Ormrod, J. E. (2014). *Child development and education*. Pearson.

Mollborn, S., Fomby, P., Goode, J. A., & Modile, A. (2021). A life course framework for understanding digital technology use in the transition to adulthood. *Advances in Life Course Research, 47*. https://doi.org/10.1016/j.alcr.2020.100379

Neophytou, E., Manwell, L. A., & Eikelboom, R. (2021). Effects of excessive screen time on neurodevelopment, learning, memory, mental health, and neurodegeneration: A scoping review. *International Journal of Mental Health and Addiction, 19*(3), 724–744. https://doi.org/10.1007/s11469-019-00182-2

Nikken, P., & Opree, S. J. (2018). Guiding young children's digital media use: SES-differences in mediation concerns and competence. *Journal of Child and Family Studies, 27*(6), 1844–1857. https://doi.org/10.1007/s10826-018-1018-3

O'Neill, B. (2015). Ecological perspectives and children's use of the Internet: Exploring micro to macro level analysis. *Eesti Haridusteaduste Ajakiri, 3*(2), 32–53. https://doi.org/10.12697/eha.2015.3.2.02b

Odgers, C. L., Schueller, S. M., & Ito, M. (2020). Screen time, social media use, and adolescent development. *Annual Review of Developmental Psychology, 2*, 485–502.

Robidoux, H., Ellington, E., & Lauerer, J. (2019). Screen time: The impact of digital technology on children and strategies in care. *Journal of Psychosocial Nursing and Mental Health Services, 57*(11), 15–20. https://doi.org/10.3928/02793695-20191016-04

Roubinov, D. S., & Boyce, W. T. (2017). Parenting and SES: Relative values or enduring principles? *Current Opinion in Psychology, 15*, 162–167. https://doi.org/10.1016/j.copsyc.2017.03.001

Schoon, I., & Heckhausen, J. (2019). Conceptualising individual agency in the transition from school to work: A social-ecological developmental perspective. *Adolescent Research Review, 4*, 135–148. https://doi.org/10.1007/s40894-019-00111-3

Sharpe, A. M. (2021). *The effects of touchscreen technology usage on the social emotional development of preschool-aged children.* Doctoral dissertation, University of the Pacific. https://scholarlycommons.pacific.edu/uop_etds/3749/

Sprung, B., Froschl, M., & Gropper, N. (2020). *Cybersafe young children: Teaching internet safety and responsibility, K–3*. Teachers College Press.

Sroufe, L. A. (1996). *Emotional development: The organisation of emotional life in the early years*. Cambridge University Press.

Stoilova, M., Livingstone, S., & Khazbak, R. (2021). *Investigating risks and opportunities for children in a digital world: A rapid review of the evidence on children's internet use and outcomes (Innocenti Discussion Paper No. 2020-03)*. UNICEF Office of Research.

Suhana, M. (2017). Influence of gadget usage on children's social-emotional development. In *Proceedings of the International Conference of Early Childhood Education*. doi:https://doi.org/10.2991/icece-17.2018.58.

Tiwari, S. (2020). Understanding the 3Cs: Child, content, and context in children's educational media. *TechTrends, 64*(3), 348–350. https://doi.org/10.1007/s11528-020-00482-8

Vygotsky, L. S. (1934/1987). Thinking and speech. In R. W. Rieber & A. S. Carton (Eds.), *The collected works of L.S. Vygotsky, Volume 1: Problems of general psychology (pp. 39–285)*. Plenum Press.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wartella, E., Rideout, V., Lauricella, A., & Connell, S. (2014). *Revised parenting in the age of digital technology: A national survey*. Center on Media and Human Development, School of Communication, Northwestern University.