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**Space and practices: Engagement of children under 3 with tablets and TVs in homes
in Spain, Sweden and England**

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Space and practices: Engagement of children under 3 with tablets and TVs in homes in Spain, Sweden and England

Abstract

Young children's engagements with digital technologies form part of their emergent everyday literacy practices. The study reported here derives from the pan-European study "A Day in the Digital Lives of Children aged 0-3". The methodology was centred on the videoing of an entire day's experiences of a child aged under 3, together with a reflective interview with the parents and inventories related to digital access, skills and activities of the child. In this paper we look at three children in Spain, Sweden and England. We examine our data through three prisms. (1) Spatio-temporal: We consider the child's engagements in terms of their appropriation of space, in relationships with others in the home and the intimate geographies of young children's digital literacies (Valentine, 2008). (2) Parental discourse: We use the tensions and contradictions for families framework (Kervin, Verenikina and Rivera, 2018) to examine the selection and monitoring of digital literacies. (3) Practice: Drawing on the first two prisms we zoom into how children engage with tablet devices and television. Our research demonstrates richness, diversity and agency in these young children's practices with the technologies. We propose the concept of *living-room assemblage* (cf. Bovill and Livingstone, 2001) as an analytical metaphor to understand the macrohabitats (Ochs, Solomon and Sterponi, 2005) of young children's digital literacies and practices, which emerge as multi-layered, creative and co-occurring with other family activities. Our analysis also explores the challenges presented to parents and the ways in which they navigate tensions and contradictions in their media and digital environments, which are condensed in family practices and discourses around tablets and television.

Keywords:

Digital Technologies; Young Children; Families; Media; Tablets; Television; Home; Assemblage.

Introduction

The developing field of digital literacies and early childhood has shown that young children's engagements with digital technologies form part of their emergent everyday literacy practices (Marsh, 2004; Chaudron 2015). From birth, children access and use a wide variety of technologies, and learn to interpret and produce meaning using multimodal resources framed through existing and new digitally mediated cultural practices (see Erstad, Flewitt, Kümmerling-Meibauer and Pereira, 2020 for a complete synthesis). In particular, the younger the children the more probable that their home is the main space where they engage with digital technologies, with the mediation of family members and other visitors in the home. The digital practices and skills they develop at home are considered to have important implications, including for their learning in school (see Sefton-Green et al., 2016). Nevertheless, there is relatively little knowledge about young children's digital literacy practices in their homes (Ólafsson, Livingstone and Haddon, 2013; Kumpulainen and Gillen, 2017, 2020). Thus, the purpose of this paper is to examine how young children engage with digital technologies in the home, and how digital practices relate to other family activities, focusing on the spatio-temporal organization of digital activity, parents' discourses, and young children's actual practices.

Discussions of practices with media in the home have built on different spatial metaphors. Work on older children and teenagers' engagement with media have gravitated over the last three decades towards the notion of *bedroom culture* (see reviews by Livingstone, 2007; Bovill and Livingstone, 2001; Lincoln, 2013, 2016). This notion initially developed in early cultural studies to acknowledge girls' participation in youth subcultures in intimate spaces in contrast to male street cultural practices (McRobbie and Garber, 1976). It later developed into broader analyses of adolescent socialization, media and home spaces (Feixa, 2005; Lincoln 2013), including a focus on how digital technologies and media add particular nuances to this metaphor, such as work around *cyber bedrooms* (Davies, 2004; Gannon, 2008). This research has helped intertwine family (digital and non-digital) media practices within larger historical transformations in the organization of the, primarily (but not only), middle-class Western home; social transformations connected to late modernity (Beck, 1992); debates about the retreat of children and youth from public spaces (Gillis, 2008; Zehier, 2001), and subsequent transformations in contemporary homes (Poveda, Morgade and González-Patiño, 2012). In addition, as most discussions of bedrooms and media have in mind older children and adolescents, the focus is on developmental dynamics relevant to these age groups, such as identity development, individualization, the growing importance of peer relations or the need for privacy within family and home spaces (Feixa, 2005).

More recent studies on young (under 8 years of age) and very young (under 3 years of age) children's engagement with digital technologies (e.g. Chaudron, 2015; Chaudron, Di Gioia and Gemo, 2018; Gillen et al., 2018) continue to stress the importance of the family and the home in young children's engagement with digital technologies and media but have turned the focus to the communal spaces of the home macro-habitat (Ochs, Solomon and Sterponi, 2005) - rather than individual and private bedrooms - in which young children, arguably, spend more time. Advancing some of our findings, this article presents data from very young children that clearly illustrates the prevalence of living rooms, kitchens and shared spaces in young children's family lives and experiences with digital technologies; so when turning to the digital media experiences of younger children, it seems that the focus on the bedroom would need to be reexamined. A simple solution could be to extend the above framework and propose living-room culture as a complementary construct to understand the media experiences of younger children. However, from our perspective, there are at least two interconnected arguments that suggest that this move is not straightforward. In other words, from our perspective, moving the focus to younger children and other domestic spaces involves more conceptual work than simply replacing 'bedroom' with 'living-room'.

First, children's engagement with digital media in communal spaces intersects in complex ways with the activities of other family members co-present in these spaces. This has become particularly true for some families where the living room has been transformed from a place of shared activities to multiple layers of practice and connectivity, within and beyond the physical space, for example using TV and screens (D'heer and Courtois, 2016). Also, digital media and the current diversity of digital devices are used by children alongside various non-digital literacy artifacts and other objects and materialities. Second, the origin (McRobbie and Garber, 1976) and subsequent conceptualization of bedroom culture (Lincoln, 2016) seems to draw on a rather reified and essentialist notion of 'culture'. For example, the succinct definition provided by Livingstone (2007: 302) stresses shared practices and ways of being in the bedroom: "'Bedroom culture' - especially for young people, a set of conventional meanings and practices closely associated with identity, privacy and the self has become linked to the domestic space of the child's bedroom in late modern society".

In contrast, from our perspective, to understand young children's engagement with digital media and technologies a much more dynamic perspective is required, one that can account for how the human and non-human interact and for how digital and non-digital objects are used and taken up by social actors in social practice. A possible alternative is to think of these interconnections as an *assemblage*, drawing from Actor-Network Theory (Anderson and McFarlane, 2011; Farías, 2010) and, particularly, by downscaling to the home environment

how the concept has been used in urban studies. Farías (2010, 2011) proposes we understand cities as complex composites of architectural and physical elements, socio-technical systems, human actors and digital/non-digital objects and devices (among other things). Yet, these elements are not configured in a stable and unitary way (i.e. a 'culture'); rather they are emergent, enacted and assembled in different (co-existing) fluid networks of particular elements. Further, assemblages are performative: they facilitate action trajectories in particular directions which, in turn, may reconfigure how the elements of the assemblage are structured (see also Bryant, 213). Drawing from this, young children's engagements with digital technologies in the home could be seen as contributing to emergent *living-room assemblages*, in which literacy and digital practices emerge, parental ideologies are enacted and domestic space is reconfigured. Such a perspective is also in line with a processual approach to home environments centred on understanding the practices, materialities and temporalities that constitute and reconstitute home environments (Pink et al., 2017).

This article explores this conceptualization of the living-room and home communal places and examines three aspects of young children's engagement with two particular digital technologies: tablets and televisions. These two devices, present in the homes of the participating families, exemplify the intersections between broader discourses on digital technologies and media and children's agency in configuring actual digital practices in the home context. First, we examine the spatio-temporal organization of children's digital practices in the home, within the network of social and material relations and activities in which they are embedded. Second, we examine how parents navigate the tensions and contradictions (Kervin, Verenikina and Rivera, 2018) that surround the culturally unprecedented engagement of very young children with digital devices and media. Third, we zoom into the affordances of children's engagement with tablets and televisions as two media and digital technological devices that, based on our data, crystalize current debates in the study of the digital literacies of young children.

Methodology

The data shared in the paper is derived from 'The Digital Lives of Children aged 0-3' project, which aimed to identify the way in which digital technologies inform the lives of very young children and their families (see Gillen et al., 2018). Thirteen families from six countries (England, Spain, Israel, Finland, Sweden and Portugal) participated in the study, and each family had a focus child aged between nine months and 34 months at the time of the visits. Data were collected during 2017/2018. Families were recruited from researchers' informal networks at each site and volunteered to participate in the study without any recompense, despite the considerable commitment required to participate in the study.

The research design of the project adapted the 'A Day in the Life' methodology (Gillen et al., 2007). This approach uses a combination of interviews, fieldnotes and video recordings to collect data - with the focus being on one day in the life of the child and their family. This design was first implemented in a project studying two-and-a-half-year-old girls in their home settings in six countries (Gillen and Cameron, 2010) and it has since been adapted to study young children in transition between Early Years settings and their homes (Gillen and Cameron, 2017).

Researchers put considerable energy into initial contacts with participants, including discussing ethical issues, yet the precise implementation and negotiation of procedures varied as appropriate to each setting. Data collection follows a three-step approach. First, during a familiarisation visit a pilot video recording is conducted, the general approach and logistics of the study are discussed and a date for the main video-recording is negotiated. Second, during the main 'Day in the Life' visit the child's activities are, when this is possible, recorded for a minimum of six hours (with the camera off for sleep, bathroom and any requested periods). Most of the recording takes place within the child's home but it includes following the activities outside the home in some cases. Ideally, fieldwork includes two researchers who share responsibilities in conducting the video-recording, handling the video equipment and taking field notes during the data collection day. Third, researchers separately examine the video and identify through consensus approximately six episodes -representative of the child's diverse engagements with digital technology - that, potentially, encourage parents to talk about family life, values and uses/practices of digital technologies. Researchers return to the family and the compilation is shown to the participating adult family members and used for a semi-structured interview and discussion of the materials, which is itself recorded and becomes part of the dataset. Finally, for this study, during data collection an inventory of the digital technologies present at the home was made and researchers (in some cases in collaboration with family members) created schematic floor plans of the home.

This paper focuses on three case children and their families: Roser in Catalonia (Spain), Lily in England (UK) and Oscar in Sweden (all names are pseudonyms). The three children provide interesting contrasts regarding how digital technologies are incorporated into the lives of young children and how contextual factors mediate these digital experiences. Table 1 presents a brief description of the three participating children and their family unit:

Table 1: Participant children and their families (pseudonyms)

Child	Family members present for the most part of the 'day'	Languages used in the home	Recording
Lily (f), 14 months, England (UK)	Mother and father.	English. Also Malay between parents. All technologies and media in English.	Times: 10:10am - 5:30pm (with breaks). Total filming: 6 hours.
Roser (f), 19 months, Catalonia (Spain)	Father and younger brother (4 months old). Mother joins after work.	Catalan. Spanish and English are also used in some media.	Times: 10:50am - 4:50pm (with breaks). Total filming: 4 hours. ¹
Oscar (m), 29 months, Sweden	Mother, father and two older brothers.	Swedish.	Times: 7:30am - 4:30pm (with breaks). Total filming: 7:28 hours.

To close this methodological section, two important considerations need to be pointed out in relation to the 'Day in the Life' / 'Day in the Digital Life' approach. First, it is a case study methodology in which the lives of different children (cases) are documented and then examined comparatively. As explained, the selection of participating families -given specific age requirements- and particular cases for comparison is based on practical logistics (convenience sampling). Relevant contrasts and insights emerge through the analysis but not as initial selection criteria. Second, the full collection of cases vary in relation to dimensions such as nationality, gender, cultural-linguistic background or socio-economic status but the comparison does not build from claiming that the cases are "representative" of any of these group demographics nor does the analysis intend to make claims connected to these variables.

Results

Spatio-temporal organization of young children's digital assemblages

In this section we consider how children's engagements with the two digital technologies we examine in this paper involves particular appropriations of domestic space, emergent relationships with others in the home and contributes to build the intimate geographies of young children's digital literacies (Valentine, 2008). Drawing from work developed to study child directed communication, these spatial arrangements constitute children's home digital habitats (Ochs, Solomon and Sterponi, 2005) at two interrelated scales: the macro-habitat, defined by social and material arrangements and activity patterns around television and tablets, and the micro-habitat of emergent interaction with/around these digital devices (see

subsection below). We examine macro-habitat arrangements with the two focal digital technologies for the three case children through two analytic devices: a summary house-map for each case that visualizes the relevant assemblages around tablets and television in the home and a comparative tabular timeline of the three cases. These tools provide a first portrait of children's digital home (or living room) assemblages.

Lily lives in a one-bedroom apartment in the North West of England. Her activities on that 'day' take place effectively in one small, but comfortable, room (the home living-room), which is well equipped for her at the age of fourteen months. The room has diverse technologies, including a TV, a laptop, her own tablet and an electronic toy - which are often present or used in combination - and occasionally parents' smartphones. Lily frequently plays on the carpet in the room with a tablet adapted for her with a pink frame and handles. She does so on her own or with one of her parents, who comes and occupies the space either on the settee or in the middle of the carpet. Lily also watches TV on the carpet, sitting on a cushion, or sitting on the settee or the armchair. What characterizes well Lily's engagements with the two focal technologies is that, while most activity takes place within the living room area, she is very active within this space, moves about with the tablet as she engages with it, watches television from various locations in this space and also simultaneously uses the tablet and watches television (which is constantly on throughout the day). Also, she often engages with these devices on her own, while her parents are engaged in other activities. Figure 1 summarizes Lily's home assemblages with television and tablets².

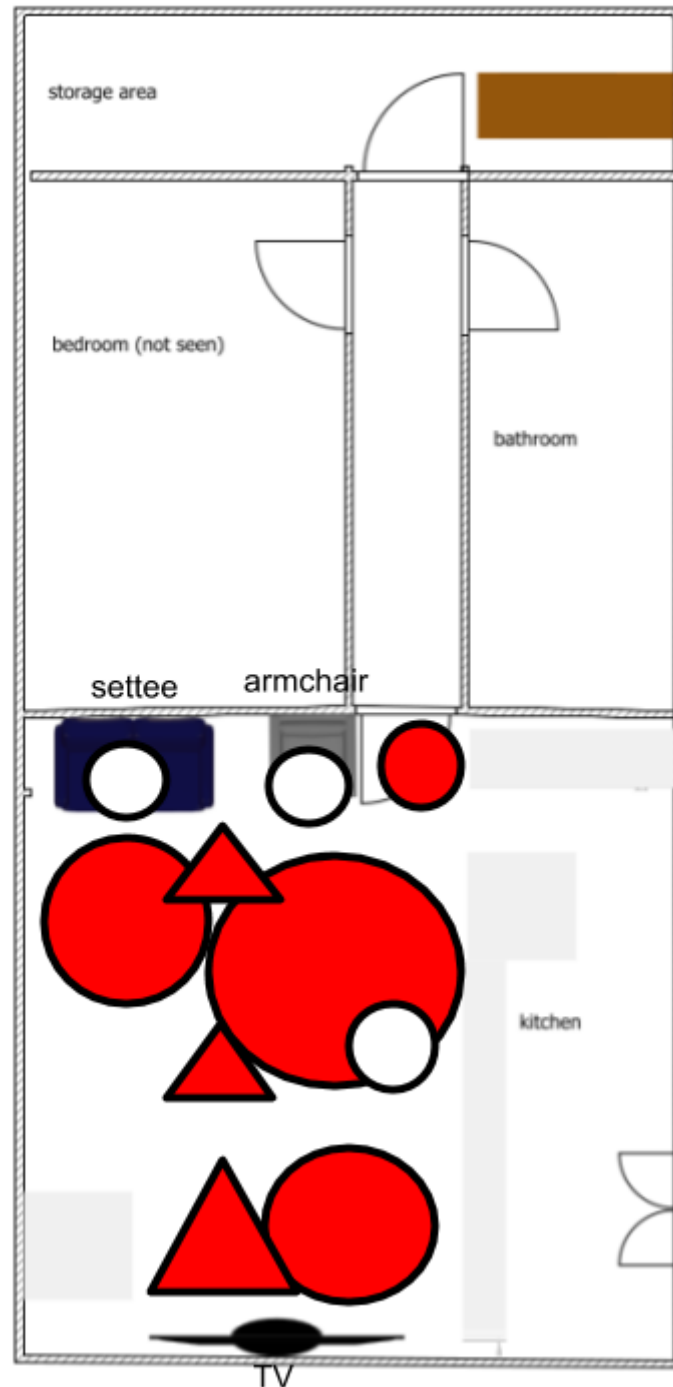


Figure 1: Lily's spatial engagement with tablets and television in her home

Roser lives in a two-bedroom flat with two floors near Barcelona. The compact-sized living room where she stays much of the time when she is at home is well equipped with technologies. In the living room, there is a large TV attached to the wall through a flexible arm and a tablet with a keyboard which, when not used, is kept in a nook with a socket behind the TV. Roser's engagement with the tablet device centers on her meals, which she has sitting down on a children's chair in front of the small coffee table in the living room. She watches

cartoons on the tablet device during breakfast and lunch, including the time while the father prepares the meal in the kitchen: The father says “it helps us to keep her still.” In the afternoon, the television is turned on by the father to watch the news and a series for adults and then is left on for the rest of the day. It is watched sporadically by her father and Roser only pays attention to it during specific moments: when sounds or images in the programmes or commercial breaks draw her attention, while engaging in other activities such as playing on the carpeted floor, painting on paper on the coffee table, or looking at photos on the father’s mobile phone while lying on the sofa. In this way, compared to Lily, Roser's engagement with digital media is quantitatively less frequent and also spatially much more constrained (Figure 2):

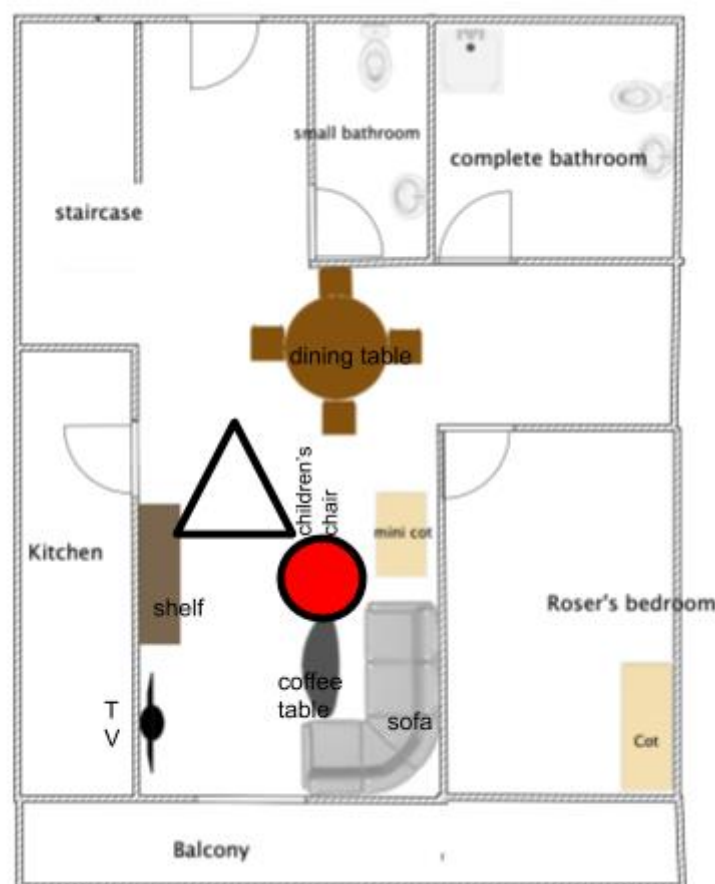


Figure 2: Roser's spatial engagement with tablets and television in her home

Oscar lives in a townhouse with three floors, including a basement, in a central part of a town in the southern region of Sweden. All of Oscar’s digital activities take place on the sofa in the living room on the ground floor, from where he watches an internet-connected TV. He does so on his own for several hours throughout the day and also with his two older brothers in the early morning and in the evening when they are home from school. Oscar has his breakfast and afternoon snack watching TV. Oscar is not allowed to handle the remote control on his

own, thus he needs to ask his mother to turn on the screen and change programmes. The family does not possess a functioning tablet at the time of the recording (but his older siblings received hand-held devices as gifts a few weeks later and he progressively becomes more interested in these). In short, through the day of the recording Oscar is intensely engaged with one particular technology (a smart television connected to on-demand streaming services), which he watches on his own or with his older siblings as summarized in Figure 3:

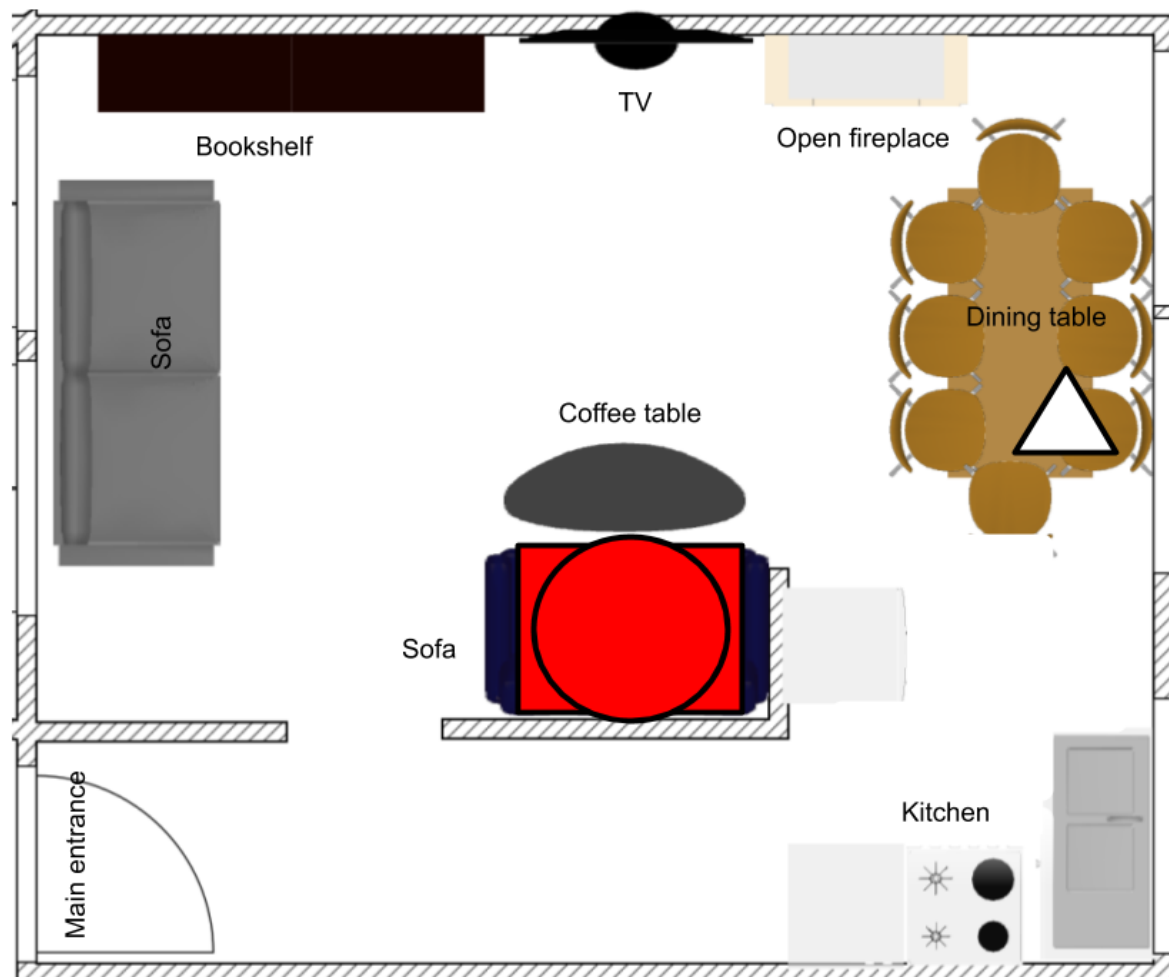


Figure 3: Oscar's spatial engagement with television on the ground floor of his home

This spatialization of digital activity in the communal spaces of the home also has a temporal organization. This temporal unfolding is different for each child and through the comparative analysis of the three cases we can see how engagement with different digital media technologies and the social organization of activity intersect (Figure 4).



















Period	Lily			Oscar			Roser		
	TV	Tablet	Social Organization	TV	Tablet	Social Organization	TV	Tablet	Social Organization
Breakfast									
Morning									
Lunch									
Afternoon									

Figure 4: Temporal patterning and social organization of engagement with television and tablets

Across the three homes, children may be highly engaged with media devices - on their own or alongside other family members - and put digital media at the centre of their activity (shown as a continuous line in Figure 4) or their engagement may be low and media remains in the background of activity (shown as a discontinuous line in Figure 4). In two homes (Lily and Roser) the television is turned on for portions of the day but is situated differently in the activities of the family. In Roser's family it basically remains in the background in the afternoon and is never the centre of Roser's attention - although she occasionally orients towards the screen for some adverts and noticeable changes in the sound and music coming out of the television. In Lily's case the television weaves in and out of the focal interest of different family members who throughout the day engage with different broadcast television programmes. In contrast, Oscar engages with "on demand" television. That is, he explicitly requests watching television, his mother switches it on and selects the programme to be streamed. He consumes these programs in a focused and extended way in different discrete moments throughout the day and his mother switches off the TV when he moves on to other activities. Tablet devices (for the two cases who used tablets at the time of data collection) structure children's attention differently, as they always seem to be a much more focal element of children's activity when they are used. However, there are again differences across cases: Lily engages in almost continuous use of her own tablet device for a long stretch of time during the middle of the day

in a series of interconnected activities in which the tablet is co-present with other media, while Roser watches videos on the family tablet during two discrete moments of the day while having her meals and without the TV on (see section below). The rest of the time, the tablet is not directly available for the child because the parents put it away to recharge behind the TV.

Further, this temporal organization is supported by different social arrangements, which also vary across families and seem indicative of a part of the social dynamics at the home. Lily's experience with digital media could be described as "organic": she seems to move fluidly across devices and activities throughout the day in a setting in which for most of the day her two parents are co-present and also move seamlessly in and out of activity with Lily. In contrast, the engagement of Oscar and Roser with one digital/media technology is "segmented": both children engage with one type of technology during specific activities and moments of the day. In addition, these moments have a social organization that is repeated throughout the day. Oscar watches television on his own in the morning while his mother is engaged in other activities - and monitors Oscar from a distance - and alongside his brothers in the early morning and afternoon. Roser uses the tablet device during meals alongside other family members: they sit around a small table and Roser engages with her tablet within an activity system in which she eats watching her tablet, while her father simultaneously attends and feeds Roser and her infant sibling. In addition, during the afternoon and late afternoon there are other dyadic episodes between Roser and other adults in which the television is marginally relevant in the background: first, Roser plays with her father and later she sits beside her mother in the living room table when she arrives home from work and interacts with her mother while her mother eats a late lunch.

Parental discourses: Tensions and contradictions

In this section we focus on parental discourses about digital media technologies in terms of tensions and contradictions as identified by Kervin, Verenikina and Rivera (2018). The findings in this section are drawn from the same data as in the spatio-temporal organization and based on fieldnotes, video recordings, and interviews with parents. Kervin et al. (2018) identified tensions and contradictions in a substantial empirical study of parents' practices and understandings of digital play in Australia. Their co-constructed model of tensions and contradictions for families (TCF) emerged in three areas: practices, selection, and monitoring whereby "parents seem to reveal tensions and contradictions as they make sense of each area in their own homes for their own children" (Kervin et al., 2018: 126). The TCF model organizes key educational and developmental questions in relation to children and digital technologies in the home: the knowledge provided by digital technology (practices), how parents can be supported in their decision-making regarding the educational or developmental

value of media and apps (selection), and how apps and media consumption may enable or inhibit learning and development (monitoring). Finally, the TCF model includes two factors for tensions and contradictions within each area, generating a framework with a total of six factors to be explored regarding parental discourses. We work with a slight adaptation of Kervin, Verenikina and Rivera (2018: 127) to produce a TCF framework captured in Figure 5.

Practices	What knowledge do digital technologies provide?		
	Expertise with technology as a 'new basic'.	↔	Children also need other educational 'basics' (e.g. literacy and numeracy skills).
Selection	Which apps/TV activities best support children?		
	Children need access to good quality products.	↔	Families need guidance in finding good quality products.
Monitoring	What are the enablers and inhibitors of these for children's learning and development?		
	Independent, creative and self-managed interactions with apps.	↔	Questions about screen time and interaction patterns.

Figure 5: Tensions and contradictions for families (TCF) regarding digital technologies (adapted from Kervin et al., 2018: 127)

Our applications of the TFC framework allows us to compare discourses around broadcast TV and 'new' digital tablet devices. This comparison is potentially interesting as (analog broadcast) television was experienced by parents during their childhood, while their children have incorporated digital television as one digital technology among a host of media and devices. Specifically, given the place that television and discourses on television might have played in parents' early socialization we explore how these experiences interconnect with discourses about the educational value of media and the developmental trajectories that are imagined for young children as they come into contact with various digital technologies. A first aspect to examine is related to the belief that digital technologies provide instrumental knowledge. Families are concerned about developmental and educational aspects of their children's current and future lives. Here, the families recognise the use of digital technology as a new 'basic skill', whether it is defined as such for the current activities and needs of the child or postulated for a later developmental stage. What varies across families is how parents understand the place of these new skills alongside other skills: Roser's parents view that

technological skills do not supersede what they call "principles of knowledge", such as reading and writing on paper, and it is these later basic skills that should be acquired before learning digital skills. In contrast, Oscar and Lily's parents see the different skills as complementary to each other but given that they have made different decisions and arrangements in their homes in relation to the presence of digital technologies, they maintain different ideas regarding how digital media technologies can support the development of other basic skills. The result is a pattern of interconnections for each family, summarized in Table 2.

Table 2: Parental discourses on skills and the value of television and tablet devices

Child / Family	Discourse on skills	Temporal projection of digital skills	Television	Tablets
<i>Lily</i>	Digital skills and other skills complement each other.	Relevant to current activities of the child.	Supports skills development.	Support skills development.
<i>Roser</i>	Digital skills is a new skill to be developed after other basic skills (i.e. print literacy).	Relevant to future needs and activities of the child.	Not used 'educationally'. Related to leisure.	Do not support skills development. Related to leisure.
<i>Oscar</i>	Digital skills and other skills complement each other.	Relevant to needs and activities in the near future of the child.	Not used 'educationally'.	Not used.

Turning to discourses on how digital content and media are selected, we explore the tensions and contradictions around decisions regarding how to choose high quality products for the children. All families show an awareness of the debates regarding the need for children to be able to access quality and developmentally appropriate media products, and at the same time, vary in their expressed need for guidance in making these decisions. For example, Oscar's mother has an overall concern about the knowledge-gap between herself and her older children, particularly Oscar's two older brothers who are already users of different digital technologies (while Oscar is not allowed to be part of these activities). In the interview, Oscar's mother expressed: "And this is what could be called the new society, and just to accept what they are doing and realise that you are more than one generation older than your children". These generational contrasts are perhaps also mirrored in how parents construe their control over different technologies, as all families show great awareness of the need to access quality media and productions in television and tablets and consider themselves as having good skills in finding and selecting educationally and developmentally appropriate television content. The

Swedish parents mention turning to public service / public television as a way to ensure quality educational media productions.

Further, from our perspective, these discourses are closely intertwined with parental monitoring given the digital media habitats we identified for each family. For some children, selections and decisions over content, in practical terms, means managing exposure and time dedicated to media consumption. In other families, the convergences between technologies (e.g. on demand television and media apps on tablets) means that similar strategies can be put into motion across devices. From this perspective, different monitoring strategies are implemented by each family.

Lily seems to have the highest exposure to digital technologies and media and, drawing from the day we observed, apparently the least restricted access to content and media. In addition, her engagement with television is through open broadcast programming and general multi-purpose apps in her tablet, such as YouTube or Children's British Broadcasting Corporation (CBBC; public license-based television). However, her parents monitor and mediate this access through their decisions regarding what programming is selected on the television (for example, in the morning they select nature and wildlife programmes or children's programming; later turning to programmes attuned to their own leisure time interests) and how Lily uses the tablet apps. In addition, they report in the interviews that apparently non-educational / non-child oriented content (i.e. advertisements with repetitive, musical elements) engages Lily. In short, the strategies put into action by Lily's parents are situated within a parental discourse that stresses finding a balance between the media interests of all family members and between digital and non-digital activities.

In contrast, Oscar and Roser only engage with one type of digital technology at specific moments of the day and monitoring of media content is structured by the technological affordances of the device. Oscar consumes primarily on demand content that is pre-selected and arranged by his mother, and Roser watches cartoons on the family tablet - usually different episodes of the same series that is put on by her father who describes it as Roser's favorite. This approach to digital media management is aligned with an ideology that prioritizes the non-digital over the digital. In Oscar's family this is achieved by stressing the prevalence of other non-digital activities and interactions throughout the day. Roser's parents are more vocal in expressing concerns over the digital and actively restricting access, as stated by her mother during the interview: "(...) the later you enter this [technological] world, the better. And when you enter you should know what is there. I think that if you teach [the children] from when they are small, that access is so easy and such, and then to cut it is much more difficult (...)".

In summary, the TCF framework serves as an organizer to examine the discourses of parents of very young children in connection with their first experiences with digital technologies in daily life. None of the case families have turned against digital activities or excluded digital media from their home but have selected, filtered and monitored exposure to digital technologies in different ways. These decisions are connected to parental discourses on the nature of digital skills (and their relationship with other skills) and the developmental value of digital media; ideas which, arguably, build on their own experiences with television as part of their own socialization.

Zooming in on children's engagement with digital technologies: A look at three digital media micro-habitats

To close our analysis of the three cases we present three detailed narrative vignettes of the type of interactions around technology that emerge within the assemblages we have discussed. These selected scenes provide a window to the micro-habitats (Ochs, Solomon and Sterponi, 2005) that are created around/through the two focal digital technologies we examine in this paper. They illustrate what it means to engage organically with digital technologies in a family setting where digital media technologies are seen as a part of the current interests and life of the child (Lily) or to engage in a segmented way with digital media technologies in family settings that have structured restrictions on how children use these technologies (Oscar and Roser). Given these broader child and family patterns, we present an episode of Lily's day in which multiple devices, interests and activities intertwine, a part of Oscar's day that illustrates how he watches television while having a snack and one of the occasions in Roser's day in which the tablet device is used while she has her meal with her father.

Excerpt 1 / Figure 6 : Lily, tablets, television, ongoing play and other activities



It's mid morning, Lily's father is preparing food in the open plan kitchen area to the side of the living room. The TV is broadcasting a wildlife programme that the parents especially take an interest in. Lily's attention is intermittently drawn, especially through sound, to the programme. For example, once she turns to the TV at the sound of a river. During this episode, Lily's mother draws her attention to a bear on the TV programme and Lily's own large toy cuddly bear that is next to the television. However, at this point, Lily's main interest lies in the tablet which she is using while assisted and monitored by her mother. Lily is alternating between "the ice cream song" and a YouTube video with different colour blobs. While Lily distributes her interests

	and attention to all these digital and non-digital artefacts, her mother also has another agenda: to occasionally feed Lily a titbit from a bowl.
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Excerpt 2 / Figure 7: Oscar watching television while having a snack



It's afternoon, Oscar is back inside after an hour of playing outdoors. He wants to watch TV again and sits down on the sofa. His mother asks him to come and wash his hands. Oscar washes his hands before having a snack. He gets some raisins and biscuits while sitting on the sofa. Oscar asks his mother to turn on the TV and put another episode of *Pippi* on. She takes the remote control from the mantelpiece and turns on HBO Nordic, a subscribed video-on-demand streaming service. Oscar watches a new *Pippi* episode completely focused on the programme, he recognises the characters and says their names aloud. His mother sits down by the kitchen table and she observes Oscar and the screen on and off from a distance. There is little communication between the two of them. She picks up her smartphone and checks text messages. Oscar asks for more snacks. His mother puts down the smartphone, leaves her chair, and gives him a refill. Then she goes back to the table and her smartphone. Oscar looks intensely at *Pippi* on the screen. Then he suddenly becomes lively and laughs out loud and he jumps up and down on the sofa. During the episode the testing of the IPA (Important Public Announcement) siren system sounds loudly outdoors, but Oscar does not react to the noise (that is only heard once every trimester).

Excerpt 3 / Figure 8: Roser engaging with her tablet while her father feeds her



It is lunchtime and the father has just finished preparing Roser a purée. The father goes back to the living room and adjusts the children's chair and the sofa-table where Roser will have lunch. He also puts the tablet on the table. Roser begins to scream when the father takes her to the chair. "Are you gonna sleep while eating? Can you help me a little bit?" says the father, ironically, while Roser keeps crying. Roser stops crying all of a sudden when the father puts on *Mic*, her favorite cartoon, on the tablet. While the father goes back to the kitchen to pick up her meal, Roser interacts with the cartoon with little sounds and gestures: she says "ah ah", while pointing at the main character when it appears. Sitting down on the sofa, the father feeds Roser while she watches the cartoon. From time to time her father gently moves her hand to avoid her falling asleep. The father says "Oh! What a yummy purée!" and "Roser eats very well today!". Roser repeatedly says "Mic! Mic!", emulating one of the characters in the cartoon who is trying to find Mic and calling him

	continuously. Roser and the father have a little conversation about the cartoon content. She continues to eat silently until a snail appears, calling it "gol" (snail is "cargol" in Catalan).
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These three vignettes show some commonalities in how the three children relate to these two types of digital media, such as the relevance of sound cues on the television or tablet cartoons in structuring their attention (Mackey, 2020: 296) - while other conspicuous environmental sounds might be completely disregarded (such as Oscar ignoring the loud public system sound test). The narratives also show how, despite the different devices that are used by each child and the different selection strategies in each home, the children are exposed to content aligned with their preferences and interests. Finally, the episodes demonstrate a diversity of ways in which these digital technologies are embedded into different moments of a child's day, how they are incorporated into different routines and even how they play a role in the regulation of young children's mood, feeding or alertness. The examples show how digital media is part of a calm moment in Lily's morning, allows an opportunity for Oscar to unwind after active outdoor play and supports a sleepy Roser (and her father) getting through her meal right before taking a nap.

Discussion

Our analyses point to the complexities surrounding young children's interactions with digital media. It should be remembered that in this paper we have confined ourselves to the use of two types of digital technologies, the tablet and the TV. Many others were present in the children's homes; the aims of this paper were practicable only if we restricted ourselves to two devices, excluding for example smartphones, which were significant overall in our findings of this project as a whole (Gillen et al., 2018). However, restricting our analyses in this way has enabled a depth of focus that has been fruitful. Spatial and temporal analyses around engagement with tablets and TVs revealed differences in the practices of the three homes, revelatory of the environments the parents have created but also the considerable contributions made through children's own agency. These three cases, limited as they are in number and scope, give a rich grounding to the suggestion that living-room assemblages may be a dynamic lens through which to investigate the social, spatial and material experiences of very young children with digital technologies. Living-room assemblage is one concept we hope will contribute to the study of very young children's digital literacies and practices. As advanced in the introduction, our proposal moves forward earlier conceptualizations of media, adolescence/youth and domestic spaces (i.e. 'bedroom cultures') and builds from the application of Actor-Network Theory to urban studies. Indeed, this approach has potential


connections with a sociomaterial perspective to young children's literacies (Mills, 2016; Burnett and Merchant, 2020a, 2020b), which could be explored in the future and are beyond the goals and analytical procedures we have proposed in this article.



We also found evidence to support Kervin, Verenikina and Rivera's (2018) tensions and contradictions framework to understand selection, monitoring and practices around digital technologies of very young children in families. Their model was co-constructed with parents, and although necessarily we have not been able to tease out all dimensions in this study (such as the basis for selecting specific media) our findings have lent support to the idea that parental decisions are not simple, buffeted as they are by broader but also tension-filled discourses in society around child development and education. These findings have been crystallised in the three vignettes, displaying the richness and complexity of moments in family life. More broadly, the families we examine in this paper are all conscious of the potential for an increasingly saturated media environment in the home (D'Heer and Courtois, 2016) which might obviate direct familial interaction and have developed different strategies and created their own balances.

Overall, this paper contributes to the concerns of this special issue, the place of digital media in the literacy practices of children under 3 in their homes through a theoretical and empirical discussion of family practices around two digital technologies. We have achieved this in a number of ways, including contributing to theorisations of culture involving families and young children and close analysis of data from children's everyday lives. We hope to have also suggested methodological and analytical approaches to facilitate further research.

Endnotes

1. The recording of Roser is shorter than the other cases because the researchers had to leave earlier than expected due to a medical appointment the family had for Roser’s younger brother, who was sick on the day of the recording. The main recording is complemented with an almost one-hour video recording during the first visit and pilot recording.
2. We use the following symbols and conventions for the spatial analysis of the cases (Figures 1-4):

Social Organization		
	Individual interaction between any person (see color codes) and digital devices.	Figures 1-3: The figure is red (filled) when the focal child is a main participant and white

	Use of a digital/media device alongside/with other adults.	(transparent) when the child observes this use in other family members. The size of the figure in the floorplan indicates frequency / intensity of the type of episode during 'the day'.
	Use of devices between peers / siblings.	
Temporality (Figure 4)		
Continuous time-line: Direct use of a digital device (tablet or television) by the focal child.		
Discontinuous time-line: Indirect/secondary/observed use of a digital device (tablet or television) by the focal child.		

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