Datafied childhoods: contextualising datafication in everyday life

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Abstract The article focuses on early childhood as a critical site of datafication and dataveillance. First, it provides an overview of approaches that situate the datafication of childhood within the new business logic and new modes of governance called "surveillance capitalism". Second, it presents approaches that theorise how surveillance culture has been normalised in a range of everyday family practices, including those supported by pregnancy and parenting apps, baby wearables and the Internet of Toys (IoToys). Finally, it develops the argument that we need to understand data traces as socially situated and account for the everyday embedding of algorithms in early childhood and family life, if we want to avoid the essentialism that characterises much of the debate around surveillance culture in the life of young children.

Keywords: datafication, dataveillance, children, intimate surveillance, surveillance capitalism, IoToys

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Introduction

Paraphrasing Sonia Livingstone's reflections around the "mediation of everything" (2009), one could argue that we now live in the age of the "datafication of everything", including children's everyday lives. Early childhood has indeed become a critical site of datafication and dataveillance, as the numerous downloads of pregnancy and parenting apps, the increasing sales of wearable devices aimed at babies and children, and the growing market of internet-connected toys show. The datafication of childhood often starts from early gestation, when expecting parents share the first ultrasound image, sometimes referred to as the "baby selfie" (Tiidenberg and Baym, 2017), on social media such as Instagram or Facebook. While, for parents, ultrasound sharing represents first and foremost an act of performing pregnancy and parenthood, it also marks the first step in the construction of a child's online identity as a set of data. Further digital traces of the unborn are disseminated as part of the widespread use of pregnancy apps. These apps encourage mothers to keep track of their changing bodies – by recording their weight, physical activity, diet, vitamin intake, symptoms, mood, etc. - and, simultaneously, monitor the foetus' development, while allowing for corporate tracking and mining of data.

Once the baby is born, the datafication of her/his body and her/his practices continues through monitoring apps and wearable devices. For each and every object a baby may use, it seems there is now a connected version on the market, including sensors-

equipped socks or onesies which measure heart rate and oxygen levels; smart patches and smart dummies that monitor body temperature; remotely controlled smart cribs that adapt to the baby's sleep patterns, and so on and so forth. These technologies help parents record babies' bodies and behaviour, including sleep, feeding and change patterns, and biometric data such as body temperature, heart and breathing rate, the baby's position while sleeping, etc.

As children grow up, they start engaging with mobile touchscreen technologies, apps and internet-connected objects, thus becoming generators of data in their own right. A new range of internet-connected toys (IoToys) has been launched on the market, which are connected to the internet via Bluetooth and Wi-Fi, are equipped with sensors and voice/image recognition software, and/or can be controlled and programmed via apps on smartphones or tablets (Green and Holloway, 2016). Examples include dolls based on voice recognition (e.g., Hello Barbie, My Friend Cayla) and app-enabled robotic toys (e.g., Dash & Dot, Sphero). These toys interact with the child on a one-to-one basis and provide personalised play and learning experiences, thanks to data collection and processing in real time. In offering an enhanced play experience, however, they collect a variety of "play data", including conversations, images, movements, location, and even biometric data (for example, *Teddy The Guardian* contains biosensors that monitor children's temperature, heart rate and blood oxygen saturation), that add to other personal information about children and their parents provided at the time of

registration. Moreover, many children are now chatting with home virtual assistants such as Google Home and Amazon Echo. At the time of writing, Google has revealed plans for a smart babysitter system that uses cameras and motion sensors to alert parents when their child is in danger (Pettit, 2017), while Amazon has already launched on the market its Echo Dot Kids Edition, which enables parental controls, child-friendly contents, and positive reinforcement of politeness (Seifert, 2018).

All these technologies seemingly point to the pervasive datafication of young children's lives, and the increasing positioning of children as the object of digital surveillance practices within emerging parenting cultures (Clark, 2013; Leaver, 2015, 2017; Nelson, 2010). Yet, research on this topic is still sparse, as much as it is research on how datafication is experienced in the everyday lives of adults. As a consequence, the datafication of childhood is mainly framed as only a matter of privacy (Mascheroni, 2018). Indeed, the privacy risks of internet-connected toys have figured heavily on the news whenever problems involving data hacking and other security failures have occurred. Recent examples include: the Hello Barbie and VTech data breaches in late 2015 (Holloway and Green, 2016); the security failures of Genesis Toy's My Friend Cayla and i-Que Intelligent Robot reported by the #toyfailcampaign of the Norwegian Consumer Council in late 2016 (Mascheroni and Holloway, 2017); and the breach of over 800,000 user account credentials and two million parents' and children's messages

recorded and exchanged via CloudPet – data which Spiral Toy left exposed online for anyone to access and listen to (Franceschi-Bicchierai, 2017).

The paucity of empirical evidence on the diverse uses and meanings of apps and internet-connected objects for parents, babies and children generates a further short-coming of the current debate, namely the essentialism of many claims around the social consequences of datafication (Mascheroni, 2018). These internet-connected devices are assumed as having homogenous and universal effects: that is, to increase surveillance by expanding the range of activities that are turned into digital data and become measurable and predictable. However, against the failure to account for the complex entanglements of data and agency which result in a diverse range of outcomes of internet-connected things and tracking apps, some commentators have started to call for the need to ground studies of datafication in everyday practices and contexts (Breiter and Hepp, 2018; Couldry, 2015; Couldry and Hepp, 2017; Kennedy et al., 2015). Following this line of thought, the article makes the argument that in order to understand the datafication of childhood we need to take into account the everyday embedding of data and algorithms in family life. Such an approach would be beneficial for the general understanding of how datafication operates, of its social consequences and its power dynamics. Accordingly, the first section provides an overview of theories and empirical evidence that situate the datafication of childhood within the new business logic and new modes of governance called "surveillance capitalism" (Zuboff,

2015). The following section draws on the notion of "surveillance culture" (Lyon, 2017), which assumes that datafication is embedded in the context of everyday life in the form of a soft power that pervades both imaginaries and practices of parenting – that is, it focuses on how surveillance is routinised and normalised. Finally, we develop the argument for more ethnographic research that leads to an understanding of data traces as socially situated and as deeply entangled with everyday practices, if we want to avoid the essentialism that characterises much of the debate around surveillance culture in the life of young children.

The power of datafication

Datafication refers to the process whereby most of our everyday practices online and offline - including aspects of the world not previously datafied and measured such as social relations and emotions – are converted "into online quantified data, thus allowing for real-time tracking and predictive analysis" (Van Dijck, 2014, p. 198). Through various forms of dataveillance (Van Dijck, 2014) – that is surveillance practices aimed at collecting data about consumers and/or citizens - data are continuously generated in real time, registered and stored in online corporate platforms, calculated so as to predict and manipulate future behaviour, and therefore monetised (Hintz et al., 2017; Van Dijk, 2014; Zuboff, 2015).

In this process of datafication, new power dynamics emerge that are driven by "a new logic of accumulation" that Zuboff (2015) labelled "surveillance capitalism". It is becoming a widely accepted assumption that surveillance is the business model of the internet (Mineo, 2017). The implication of the internet with mechanisms of dataveillance has expanded with the Internet of Things, which consists of objects that, by being wired, can track, speak, see and address, thus mediating what has not been mediated before (Bunz and Meikle, 2018). Therefore, IoTs further extend "the surveillance business model that had become entrenched through social media into new domains – domestic, biological, environmental" by turning "its users into a resource that creates data" (Bunz and Meikle, 2018: 31).

Critical data studies have highlighted how the power dynamics of surveillance capitalism reshape and engineer agency, by altering the conditions and structures in which individual and collective agency is embedded. The promise of big data is the opportunity of predictive analysis of aggregated data sets. Individual users and communities can benefit from big data, as the research on self-tracking has documented (Lupton, 2016; Neff and Nafus, 2016). However, data collection and analysis on a massive scale responds first and foremost to a business logic, namely "this new form of information capitalism [which] aims to predict and modify human behavior as a means to produce revenue and market control" (Zuboff, 2015: 75). Scholars have pointed to how these calculative mechanisms are based on proprietary algorithms and automated

processes, and, as a consequence, remain opaque and not open to control or modification by social actors. Therefore, the datafied environment is characterised by systematic power imbalances that constitute a defining feature of surveillance capitalism.

Concerns around the extension of dataveillance and data-driven business logic to children have been voiced on both the public and academic agenda. Such discourses point to how the algorithmic calculations through which human behaviour is measured, sorted and predicted, now form for many parents the "general background of everyday life" (Couldry and Hepp, 2017: 124). Journalling children's health and habits has long been established in paper form - whether initiated by parents or encouraged by doctors. However, tracking children by means of apps, wearables and other IoT devices turns the practice of journalling children's biometrics and other everyday activities into a form of 'dataveillance' (van Dijck, 2014).

Digital surveillance practices can be differentiated based on varying degrees of individual consent and agency. Lupton (2015) distinguishes between participatory and voluntary surveillance practices - such as the so-called social surveillance implicated in the use of social media (Marwick, 2012) or the practice of self-tracking (Lupton, 2016) - and less consensual, pushed forms of dataveillance or self-tracking. Similarly, Lyon (2017: 830) differentiates responsive and initiatory surveillance practices, whereby the former refers to "activities that relate to being surveilled", while the latter consist of

"modes of engagement with surveillance". However, irrespective of the degree of agency enabled and encouraged in specific practices of dataveillance – that is, whether practices of dataveillance are voluntary, social and participatory (Lupton, 2015) - we agree with Barassi (2017) that under the logic of datafication every form of digital participation is, at least partially, "coerced". In other words, while the physical environment is refashioned through internet-connected things that register, create and distribute data (Bunz and Meikle, 2018), the digital environment is also designed so as to encourage users to share, more or less voluntarily, their personal data. Moreover, when it comes to children, and especially young children, dataveillance is usually carried out on them by others, first of all by their parents. The set of social practices which "involves the purposeful and routinely well-intentioned surveillance of young people by parents, guardians, friends, and so forth" are usually referred to as "intimate surveillance" (Leaver, 2015: 153).

As we have seen, children's social media presence and digital participation is decided by their parents well before they are in a position to contribute to such decisions (Barassi, 2017; Leaver, 2017). One of the first practices of intimate surveillance consists of the sharing of ultrasound images on social media. Through this conversational act, parents announce the new pregnancy to their online social circles (Leaver, 2015), while simultaneously initiating their children's "digital dossiers" (Montgomery, 2015). Leaver's (2015) analysis of the images shared on Instagram with #birth and

#ultrasound, has shown that the majority of ultrasound images displayed personal identifiable information such as those contained in the sonogram metadata – the estimated due date, the age of the mother, the place where the ultrasound was taken, etc. (Leaver, 2015).

Moreover, there is growing evidence that women are using apps for information and support during pregnancy and early motherhood in significant numbers. Pregnancy apps that invite expecting mothers to engage in day-by-day self-tracking of their bodies and that of their foetuses are getting more and more popular, as the download figures from the major app stores demonstrate. Thomas and Lupton found that "the 'I'm Expecting – Pregnancy App' [is] attracting between 1 and 5 million downloads from the Google Play store alone" (2016: 496). Three quarters of the Australian women interviewed by Lupton and Pedersen (2016) had used at least one pregnancy app for information about foetal development and information about changes in women's body related to pregnancy. By using these apps, women "do pregnancy" (Tiiderberg and Baym, 2017) – that is, they learn to be pregnant and to perform pregnancy – in a highly commercialised environment, where women gain self-knowledge, reassurance and a sense of empowerment (Lupton and Pedersen, 2016) in exchange for detailed data about themselves and their forthcoming child. Likewise, baby wearables and parenting apps promise to give (new) parents "peace of mind" by sending information in real time to their smartphones. Again, this intimate surveillance of babies also involves sharing

personal data about the baby and her behaviour in exchange for the same data returned

in the form of patterns and knowledge on which basis parents are called to act upon.

Through such small acts of intimate surveillance, then, children are constituted "as data

which simultaneously provide reassurances about their well-being to parents while

being aggregated and analyzed as elements of big data sets" (Leaver, 2017, p. 8). In the

process of commercial dataveillance, personal information is collected and stored on

online corporate platforms, often shared with third parties, and turned into a valuable

commodity, in exchange for free and customised services. Indeed, as Leaver (2017: 3)

notes, typical baby wearables devices involve two commodities:

> first, the app, monitor, wearable, or device which is sold initially to individual
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> customers, and, second, insights and analytics produced from the aggregated and
>
> analyzed data generated by the customers using these devices.

In summary, research on tools for intimate surveillance shows how parenting practices

can be imbued and implicated with a market-driven logic. Moreover, as anticipated in

the introduction, thanks to the affordances of touchscreens and apps which support more

intuitive, sensory and embodied forms of interaction through actions as simple as

touching, swiping and pinching (Holloway et al., 2013), children are socialised to

digital media content and practices at a very young age, often between six months and

two years. Recent research has shown that almost one in three 0-to-5-year-olds in the UK own a tablet and a smaller but significant proportion own a smartphone (Marsh et al., 2015). Mostly, they use tablets to access apps of various kind, play games and watch TV shows (Marsh et al., 2015). Research conducted in the US has similarly shown that 95% of children aged 8 or younger live in families where they have access to a smartphone and 78% to a tablet (Rideout, 2017). The most popular activity on mobile devices is watching videos on YouTube (73%) followed by playing games (70%) and using other apps (65%) (Rideout, 2017). Video, gaming and educational apps collect usage data, but also, potentially, personal information such as the age, gender and location of the child (Lupton and Williamson, 2017). It has recently been revealed that on the internet children are exposed to between one and two million trackers per year, collecting around five million data points. It is estimated that the number of data points rises up to 72 million by the time a child has turned 13 (Harris, 2017). Moreover, the market of internet-connected toys is projected to reach 11.3 billion dollars by 2020 (Juniper Research, 2015).

Based on these data, researchers have warned that the use of wearables, IoToys and apps of various kind allows for an unprecedented registration of children's data traces, which are re-appropriated and turned into valuable commodities under the new logic of accumulation (Montgomery, 2015). As a consequence of datafication, children's subject position in the market shifts. Holloway (in press) explains how children are re-

positioned "both as objects of economic activity (as digital labourers) and subjects of market relations (as digital consumers) under surveillance capitalism". That is, they are simultaneously situated as data sources and data consumers.

While research is still sparse, critics have already speculated on the long-term social consequences of datafication. Datafication, it has been argued, has profound implications for the current generation of children, that extend beyond a more pervasive and substantial commodification of childhood, and are likely to impact on their rights, their life chances and their future citizenship (Lupton and Williamson, 2017). These concerns are grounded in the wider literature on the dataveillance of consumers and citizens that has examined how the power of datafication operates and with what consequences. The profiling, sorting and categorizing of populations based on their consumption practices, online habits, political preferences, age, gender and ethnicity not only enable a greater market control, but also allow for new modes of governance to emerge (Cheney-Lippod, 2017; Hintz et al., 2017). "Algorithmic governmentality" (Cheney-Lippod, 2017) is indifferent to the embodied individuals it affects, though its consequences shape individuals' access to education, employment, credit, private and public services, etc.; in a word, it shapes their structure of opportunities (Crawford and Schultz, 2014). Individuals, including children, are classified as temporary members of "measurable types" without their knowledge or expressed consent (Cheney-Lippold, 2017): as such, datafied individuals are not only represented and spoken for, but also

regulated by data. Agency is mediated by the calculative mechanisms of social sorting afforded by datafication and predictive analytics (Couldry 2015). This is how power is exerted in the age of big data, when market and governance logics converge:

> The process of classification itself is a demarcation of power, an organization of knowledge and life that frames the conditions of possibilities of those who are classified (Cheney-Lippold, 2017: 7).

A growing literature shows how algorithmic classifications are used to distribute access to resources and systematically exclude those who are already vulnerable, such as the poor, immigrants, people with disabilities (Eubanks, 2018; Gangadharan, 2017; Madden, 2017; Marwick & boyd, 2018). Understanding how social sorting based on data and algorithms will affect children's futures is therefore vital. Yet, such an account of datafied childhoods is incomplete. We still know little about how this algorithmically-saturated world is concretely shaping children's everyday lives: research on how IoT devices, parenting apps and IoToys are appropriated, made sense of, negotiated, resisted in diverse settings and with what consequences (on family relations, children's learning and play practices, etc.) is still in its initial phase. Ignoring how datafication is actually embedded in the everyday practices of children and parents, and with what variations, risks to justify technological deterministic

approaches that assert the "all powerful" role of apps, IoTs and IoToys – and its underlying mechanisms of datafication and dataveillance. A first step towards an everyday approach to the datafication of childhood and parenting is offered by the notion of surveillance culture.

Surveillance culture in the context of childhood and family life

Scholars who posit a normalisation of surveillance, argue that, while classification and social sorting have always represented a form of power, what makes the contemporary process of datafication and dataveillance transformative and novel is the fact that through the rhetoric of big data – their assumed objectivity and impartiality (boyd and Crawford 2012; Couldry and Yu, 2018) - surveillance imaginaries and practices have colonised citizens' everyday lives (Lyon, 2017). In this perspective, the reason why people conform to the imperative of sharing can be found in the normative dimension of surveillance capitalism, that is, in the process whereby datafication and dataveillance have become institutionalised, naturalised and part of "the norms and beliefs about 'how things are'" (Couldry and Hepp, 2017: 32). This normalisation and legitimisation is possible because surveillance capitalism is ultimately premised on a pervasive "surveillance culture", which, according to Lyon (2017), most citizens have internalised, comply with, and reproduce in their everyday practices. Surveillance has

become something that citizens "negotiate, resist, engage with, and, in novel ways, even initiate and desire" (Lyon, 2017: 828).

Surveillance culture, Lyon explains, is formed of both surveillance imaginaries and surveillance practices, which are mutually shaping and shaped. More specifically, surveillance imaginaries can be understood as shared frames of reference that

> provide a capacity to act, to engage in, and to legitimate surveillance
>
> practices. In turn, surveillance practices help to carry surveillance
>
> imaginaries and to contribute to their reproduction. (Lyon, 2017: 829)

Likewise, Couldry and Yu (2018) point to the naturalisation of datafication and surveillance through discourses and routinised practices that frame surveillance as a natural part of the world we inhabit and data as neutral means of achieving benefits and empowerment. Indeed, there is evidence that the datafication of childhood has been naturalised within commercial discourses, in which surveillance is constructed as inherent to childhood itself and even necessary for the health and development of the child. Studies of the normalisation of intimate surveillance suggest how surveillance culture operates by pervading both imaginaries and practices. Pregnancy apps for the monitoring of the unborn, parenting apps for early parenthood and tracking devices which are worn on the infant's body are discursively constructed as socially legitimate

and desirable parenting practices. Analyses of the commercial, media and public discourses around pregnancy apps (Thomas and Lupton, 2016) and baby wearables (Leaver, 2017), using Critical Discourse Analysis (CDA), have highlighted the normative and performative nature of those discourses. These technologies are commercialised and represented mainly through a discourse of risks and responsibilisation, which exploits parental anxieties and normalises the practice of intimate surveillance as a "necessary culture of care" (Leaver, 2017: 2). That is, intimate surveillance is represented as integral to the social expectations and shared norms around parenthood to which new parents are (or should be) socialised. Such a discursive strategy produces a moral epistemology through which parents are encouraged to a) conform to a normative pattern in which good parenting is associated with digital surveillance; b) trust the data that the app or wearable tracking device gives back, as objective, reliable and accurate information; and c) act upon and react to such knowledge, in order to ensure the baby's health, well-being and development. For instance, pregnancy apps provide information and support to expecting women by returning data on which basis women are encouraged to take action – for example, they are encouraged to follow a healthy diet and regularly engage in physical exercise. As a consequence, a new data subject is produced (Couldry and Yu, 2018) who is individually responsible for achieving the opportunities and empowerment that data offer. Those parents who fail to track their children with the aid of parenting apps and

wearable technologies are to be blamed as irresponsible, it is suggested in such

discourses (Leaver, 2017). Hence, the moral imperative at play here is not dissimilar to

the rhetoric of normative control that permeates the cultural practices of self-tracking

(Crawford et al., 2015; Lupton, 2016). Indeed, in both practices the (self-)knowledge

resulting from the use of monitoring technologies provides the basis for agency –

whether the goal is to achieve self-improvement and self-management as in self-

tracking, or to conform to the expected levels of parental care and grow healthy and

smart kids, as in the practice of intimate surveillance. Alternative discourses have

already emerged, including concerns that these monitoring practices may actually

increase and normalise parental anxieties (Chester, 2015; Leaver, 2017). But the

discourse that naturalises intimate surveillance is highly visible.

A similar neoliberal framework of individual responsibility can also be observed in the

discursive constructions of IoToys (Mascheroni and Holloway, 2017), where

responsibility is placed on parents both for protecting children from the potential

privacy and safety risks of internet-connected devices, and for providing them with

access to the learning opportunities of such devices. Under this twofold framework,

parents are encouraged to both protect children and invest in their future – and internet-

connected technologies are topicalized as both the solution and the problem.

Drawing on such a framework, scholars theorise that the combined effect of

surveillance imaginaries and practices embeds children in ever-intensifying networks of

surveillance, through which, it is argued, they "become 'calculable persons' who are the subject of calculations performed by others (and by other digital things)" (Lupton and Williamson, 2017: 787). According to Lupton and Williamson (2017) children grow up in a datafied environment where they are socialised to surveillance imaginaries and practices. Being under constant intimate or corporate surveillance, children learn to think about quantifying their bodies and behaviour, and to compare and assess their own measures and activities against what is considered "normal" (Neff and Nafus 2016). As Lupton and Williamson put it:

> "These calculating children are both calculated and metricized as data
> traces, but also encouraged to calculate about themselves through
> encountering their own data" (2017: 787).

With its emphasis on the everyday, the notion of surveillance culture could inform a middle ground between technological determinism and social constructivism. However, evidence supporting the normalisation of surveillance comes predominantly from discourse analysis. The picture that emerges from these studies is one of almost powerless children and parents, who have little or no agency to resist the surveillance culture in which they are immersed. This is due to the fact that research on how parents

and children conform to, negotiate or resist the normative model of natural datafication (Couldry and Yu, 2018) is still needed.

Datafication and data traces in the context of everyday life

Most recent empirical investigation in the field, instead, warns against essentialist understandings of apps, wearables and IoT devices that assume these technologies "as operating within the same political economic framework" (Barassi, 2017: 4) and thus producing homogenous effects on children and family life. Such essentialist generalizations risk to overshadow the ethnographic diversity of users, contexts and media practices (Couldry, 2004; Livingstone, 2015), and ignore the "phenomenological richness" of everyday encounters with dataveillance (Couldry, 2015). They also prevent a full understanding of how dataveillance functions as a mode of governance and distribution of power.

Many scholars now call for more attention to agency (Couldry and Powell, 2014) and to the material contexts and everyday experiences of datafication (Kennedy and Bates, 2017; Kennedy et al., 2015). Epistemological approaches to everyday life evidence the taken for granted but irreducibly messy, uncertain, contradictory and potentially transformative character of everyday practices, routines and social relations (Bakardjieva, 2011; Couldry and Hepp, 2017; de Certeau, 1984). Everyday life approaches, then, foreground the productive work enacted by users through and around

data practices. Hence, the challenge is to "analyze digital traces in a way that we can contextualize them within the figurations of humans that produce these sequences of 'digital footprints' but also use them as a means for social construction" (Breiter and Hepp, 2018: 393).

It is therefore important to document the diverse surveillance imaginaries and practices that are enacted in different families. While research on the lived experiences of datafication in family life has just started, we can build upon the established fields of the domestication of technology approach and studies of parental mediation, to point out a few directions that future research in the field could explore.

The domestication of technology approach studies the ways in which media are appropriated, negotiated, rendered meaningful, adopted within, and adapted to the "household's moral economy" (Haddon, 2004; Silverstone, Hirsch & Morley, 1992), that is the family operating as a cultural, social and economic system. The domestication of technology is always a reciprocal process, through which both the media and the family are mutually shaped. It is also, essentially, a cultural process, through which meanings and values are created and/or reproduced. In this perspective, the media are consumed and embedded in the family's culture, through different moments that involve a continuous negotiation between the meanings incorporated in the technological artefact through its design and representation, on one side, and the family's own meanings and values, on the other. Once they enter the domestic context

(appropriation), digital media are both shaped by, and shape the family's everyday life (Silverstone & Hirsch, 1992): they are found a place in the home (objectification), they are incorporated in the daily routines of family life while creating new routines (incorporation), and they are converted into symbolic resources used to express the family's identity and values (conversion). Future research should then investigate how families experience data, dataveillance technologies and IoTs in their everyday practices, how they make sense of, negotiate or resist the information and meaning generated by such media (Bunz and Meikle, 2018), to what extent they reproduce or reinvent surveillance imaginaries through their everyday surveillance practices. Moreover, in order to understand the datafication of childhood we need to take into account parents' practices - parental mediation and intimate surveillance. This is not only because young children have little agency to resist to dataveillance. But, also, because parents play an important role in the domestication of new media. In mediating their children's access and use, as well as their children's digital data traces, parents engage with, negotiate and even resist dataveillance. Amidst inconsistencies and ambiguities, two main approaches to parental mediation of children's internet use have been identified: enabling mediation – which encompasses a set of mediation practices that valorise children's active engagement with technologies - and restrictive mediation – that is, the definition of rules that restrict (screen) time and/or content (Livingstone et al. 2017). So far, studies of parental mediation pointed to the ambiguities of parents'

attitudes towards technologies. Specifically, their efforts to guide and regulate young children's use of touchscreens (tablets and smartphones) are hindered by the practicalities of everyday life: despite expressing concern for excessive screen time, parents sometimes use touchscreens as a baby sitter, to keep children occupied while they are busy doing household chores (Chaudron et al., 2015).

Moreover, contextualising datafication in everyday life means also to acknowledge that parental mediation is influenced by socioeconomic status and education (Livingstone et al., 2015; Livingstone et al., 2017) - both directly, with digital inequalities resting on, and reinforcing social inequalities; and indirectly, with parents' economic and cultural capital shaping their approach to child-rearing. Indeed, whether families are "media rich" or "media poor" (Livingstone, 2007) may be less a matter of economic resources than of parenting styles (Clark, 2013; Nelson, 2010). Parents from higher socioeconomic background tend to practice what Pugh (2009) labels "symbolic deprivation", pointing to the absence of certain goods or media at home as evidence of their good parenting. By contrast, parents from lower socioeconomic status engage in "symbolic indulgence" and provide their children with certain experiences or goods as a means of fostering their needs for belonging. Children and media studies similarly emphasised diverse patterns of parental mediation based on parents' socioeconomic status and education. Specifically, higher income, higher educated parents endorse an "ethic of expressive empowerment", encouraging children to use digital media for

education and self-development (Clark, 2013) and trying to balance online and offline activities. By contrast, lower income, less educated parents endorse an "ethic of respectful connectedness" (Clark, 2013), encouraging media uses that are respectful of parental values and rules. Research in Europe has also shown that more educated parents are usually more confident in adopting enabling mediation, whereas lower income, less educated parents employ restrictive strategies (Livingstone et al., 2015). New forms of digital divides are also emerging, with lower-income and lower educated users appearing to be more exposed to privacy risks and corporate or government surveillance (Ganghadaran, 2015).

In conclusion, the body of literature briefly summarised in this section emphasises that the internet – to which apps, IoT tracking devices and IoToys belong – is "embedded, embodied and everyday" (Hine, 2015). As a consequence, researchers should account for the diverse embodied experiences of, and multiple practices of meaning-making around datafication that are implicated in the everyday, mundane encounters with dataveillance and surveillance culture.

Conclusive remarks

This article set out to explore the diverse entanglements of data and agency in everyday life by assuming contemporary childhood as a natural domain of datafication and digital surveillance.

Through a review of the existing literature, and using the practices of tracking unborns, infants and young children as an example, the article has presented the two main understandings of how the power logic of surveillance capitalism operates. The first conceives of datafication mainly as a force which structures the opportunities that individuals can access, thanks to the profiling and social sorting of big datasets. The second, instead, emphasises the normalisation of surveillance culture as an everyday, diffused practice in which social actors can engage. The literature concerned with the datafied child has already speculated about the long term negative consequences of datafication in terms of children's access to resources and future opportunities. These works insist on how algorithmic social sorting brings along the risk of increasing social inequalities and the suppression of children's rights. Children's voices, it is argued, are seemingly silenced by the supposed objectivity and authority of (big) data that speak for them (Lupton and Williamson, 2017). On the other side, critical discourse analysis of the discursive constructions of pregnancy apps, parenting apps and IoTs aimed at the youngest has been used to argue that the datafied child as a cultural object is being normalised through the legitimation of intimate surveillance as a good practice of care (Leaver, 2017).

However, the article argues that both the approaches are incomplete if not complemented by ethnographic research into everyday life appropriations of such technologies. Indeed, the majority of current approaches to the datafication of

childhood fail to acknowledge the lived experiences through which children and their parents encounter datafication in the context of everyday life. Instead, the article aims to argue for the need to examine the everyday embedding of data and dataveillance in the very texture of children's and their parents' experiences, as a way to overcome deterministic and monolithic accounts of datafication. Analysing the social consequences of media use in context, it is argued, does not go the detriment of a critical investigation of the role of datafication in the ordering of contemporary societies nor does it minimise its profound implications for agency and social structures alike. At the opposite, a phenomenological approach to dataveillance would provide the foundations for a richer sociological critique of datafication, insofar as it would address the ontological and epistemological distance between lived experiences and the algorithmic identities that derive from our data-based attributions to "measurable types" (Cheney-Lippold, 2017).

By contrast, essentialist perspectives of datafication that fail to acknowledge the varied embedding of the internet in everyday life (Hine, 2015) are problematic both theoretically – for providing incomplete "theorizations of the new roles played by data in society" – and socially – since "data-related practices and the policies that govern them [would not be] informed by the perspectives of the people who they affect and on whose data they rely" (Kennedy and Bates, 2017: 704).

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