Conclusion

The second *beautiful era* is here. Digital and physical materials of various weights, with keys of several shapes and sizes, have supplemented the sewing machines and typewriters toys of the previous century. Through these 'new materials', young children play. While playing, they engage with a range of modes, symbols and narratives that shape a body of (embodied) knowledge. In order to inform and define the distinct aspects encountered in young children's digital play I analysed and categorised them, suggesting the digital play experience taxonomy (DPET) presented in Chapter 4. In short, the taxonomy covered five key aspects of digital play dealing with:

Vocabulary: the verbal, physical and semiotic vocabulary being shaped and developed through tablet play.

Design: the interface aspects encountered in tablets that dictate or inform how to interact with the device. It also covers some of the current design limitations in existing platforms.

Play: the way tablets and similar digital devices have entered and become a dynamic playground and how they evolve from device to toy, promoting playfulness and experimentation through children's play practices.

Interaction: the way physical interactions with tablets develop an embodied knowledge, which is performed through the hands. It takes into consideration some of the physical and digital affordances of current devices, while also acknowledging how digital and physical symbolisms, narratives and actions compose the tablet as a material.

Attachment: the relational aspects emerging and manifested through the play practices of young children. It also expands into how these physical interactions possibly overflow into personal narratives shaping one's history.

While analysing and writing, I kept on asking questions and searching for them in existing work. In this process composed of analysis and categorisation, I was able to create the framework that informed my three key theoretical contributions to the field of children studies. I proposed the concepts of digital penmanship and multimodal hyper-intertextuality, both composing the final concept of playful literacy; they are shortly defined as:

Digital penmanship: the tactile skill and knowledge (being acquired through the digits) that emerges and develops through interactions with touch-sensitive digital devices.

Multimodal hyper-intertextuality: refers to the wide array of media and modes of use composing the play experience with digital devices. The multimodal

aspects include both physical and digital mode characteristics that build the play experience, from the role of the body, to the variety of hyper-intertextual media including video, sound, text and images of various sorts.

Playful literacy: a sociocultural practice that involves multimodal interaction and communication through the use of digital technologies.

These theoretical concepts give an initial ground to be further developed. They help frame some of the everyday behaviours we encounter when children interact with digital devices.

As a number of valuable aspects characterises interacting and playing with digital materials, I would argue that older age groups engage with digital devices with similar motivation to that of children. There are aspects of curiosity, learning, attachment and playing present when tapping away on screens. Thus, digital penmanship, multimodal hyper-intertextuality and playful literacy could be applied as an initial framing when looking at how teenagers and adults interact with digital devices, although other aspects might need to be considered to expand the concepts' scope. The large amount of content assessment, work, socialisation, communication and entertainment happen through playful interactions. These new 'toys' are worldwide and we could playfully stretch it to 'worldwise' as they learn with and from us concomitantly with us learning with and through them.

Another interesting aspect of everyday interactions with digital devices refers to how these devices have allowed us to repossess our child blankets and teddy bears, becoming them. In Denmark and around the world, we carry them around, attend, interact, display and pet them. We almost never leave them behind, we keep them close, we invest in them and we hold them dear. In a parallel example, characters and mascots of all sorts pervade Japanese social contexts in personal and public displays together with digital devices – we could say that there is more space for diverse types of personal manifestation in the Japanese culture than in the Danish one. Despite this, in both countries we share our digital affection publicly as we stroke our digital devices.

Digital materials have allowed for a play come back in social and public spheres. It is possible to analyse some of these public and everyday digital performances through the digital play experience taxonomy (DPET) categories. For instance, the *vocabulary* and *attachment* categories can aid a multitude of studies looking at interactions with digital devices, where cases can be mapped in grids, using high/low attachment, vocabulary, interaction, etc. By crossing these grids with contextual information, we can unveil distinct aspects of how we engage with these devices in distinct contexts and cultures. These public performances came into focus while I was doing my research; we engage in our current realities through play, and with it, we open digital portals to a multitude of worlds. Understanding how we interact with these portals might provide us with better tools to uncover the whys.

These current public performances open for another set of questions: How will children re-contextualise their playful literacy as they grow? How will future services appropriate some of these skills towards new products? Most importantly, how do we equip educators, such as school teachers and pedagogues to explore and nourish children's early acquired set of expertise combined with the

knowledge to critically assess digital content? These questions serve as a point of departure for future research.

C.1.   Digital Devices As a New Material

Understanding digital devices as a new material − just as paper brought the possibility of turning an oral culture into a literate one − digital devices bring the possibility of turning literate culture into post-literate (McLuhan, 1962). When describing the electronic age, or the post-typography, early on, Walter Ong (1998) acknowledged that 'the new medium reinforces the old, but of course transforms it because it fosters a new, self-consciously informal style' (1998, pp. 135−136). This informality is afforded by the multimodal ways in which literacy can be expressed through and with the emerging media. The concept of the digital as a material allows for a multimodal range of performances, visual, sound, tactile and written combined. This brings the possibility of communicating with a wider variety of cues than the sole literate boundaries. It allows communication to flourish into richer expressions, where hands, eyes and faces comprise one message. Hands are in the spotlight as they shape and are shaped by these devices. From a reverse perspective, sounds and visuals are hand-dependent as the hands' actions are the input keys that make the machine respond. In this post-literate culture, digital devices are the materials that catalyse communication and information into multimodal entities that shape one another. Certainly, AI personal assistants, such as *Siri, Alexa* and *Cortana*[1], are becoming increasingly popular, which also promote oral interaction. However, when playing with tablets and other digital devices, hands are still the main tools that open the doors to other modes of communication.

Interacting and playing with this digital material (Dourish, 2016; Ingold, 2009; Pink et al., 2016) is characterised by a number of valuable aspects. Digital devices have become not only twenty-first-century children's toys but also adult toys enabled through playful interactions. This refers not only to the games available for these platforms, but to interaction as a whole. While doodling on the devices with our hands, swiping, dragging or talking to our digital personal helpers, we engage in a form of play. The toy emerges out of the context of the interaction with and between people and things (Sicart, 2014), bridging reality and fiction (Fleer, 2014; Marsh, 2010; Sicart, 2014), being an agency for imagination (Sutton-Smith, 1986) and fostering emotional connections and attachments (Fleer, 2014; Roskos & Christie, 2011) for both children as well as adults.

As 'mobile' sewing machines and typewriters set a variety of standards for businesses and fashion over a hundred years ago, mobile digital devices such as mobile phones and digital tablets have entered children's lives as toys, also setting new standards. These evolving materials have allowed the return of play in social and public spheres. Children (and we) engage in our current realities

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[1]Apple IOS, Amazon Echo and Windows intelligent personal assistants, respectively.

through playful interactions, giving birth to new norms and new ways to conceptualise the world around us.

C.2.   Some Final Considerations

Tablet devices are less than 10 years old; however, it feels like they have been around forever. The first generation growing up with these devices are approaching their teens. In the meantime, many mobile phones have increased their sizes to become almost 'mini tablets' themselves. While some tablets have also increased in size and have become a next laptop generation. Technology speeds up and we are catching our breath behind.

I set out to observe young children's play practices with tablets without being clear about whether this research would lead me to cover ground previously explored. My interdisciplinary background proved an asset. First, I was not committed to a specific discipline. Second, I pushed discipline boundaries by putting together distinct fields of research: play, multimodality, sensory ethnography and experience. By the time I was deep in my analysis phase, I made use of theoretical perspectives belonging to these various distinct groups, which was not common practice in children studies. However, this approach has been recently acknowledged by multimodality scholars as positive, due to how some of these fields of study come together in these digital experience scenarios:

> Understanding the relationship between the categories of sense and mode poses an interesting challenge for multimodality as the senses and the sensory are not within its analytical frame. However, given that the sensorial, perception and affect are a part of communication and interpretation, engaging with and reflecting on these experiential aspects of touch can open multimodality to useful conceptualisations of touch that, in turn, may help to theorise its semiotic resources.(Jewitt & Mackley, 2018, p. 10)

Throughout my analysis, it became clear that the multimodal and the sensorial embodiment aspects taking place through touch while children played were not only intertwined but also interdependent. Therefore, I could not slice one aspect out and disregard the other. Instead, I had to innovate and decided to bring these disciplines together to create a richer and more in-depth analysis. Without doubt, this decision has deeply shaped my theoretical contribution.

The choice of grounded theory proved to be very valuable as it opened my perspectives and led me to richer results. Through this methodology, I could see the backdrop for play (children's rich ways of interacting with digital materials) through the 'magic wands' (their hands), which brought me to what I believe to be valuable insights. It also led me to refute the idea of digital interfaces as intuitive and children as natural digital masters (Clarke & Svanaes, 2014; Connell et al., 2015; Prensky, 2001). Through a lot of practice and fun, children discover, explore and learn with the digital material that is intertwined in physical devices

with digital affordances. Based on these current play practices, I have proposed the concepts of digital penmanship and multimodal hyper-intertextuality, which together compose the concept of playful literacy.

Arriving at these proposed concepts was not a smooth process, and I had to delimit my process by setting a number of defining variables. Therefore, besides the considerations already presented in Chapter 3, I acknowledge another set of limitations, which potentially impacted my analysis and results.

The first limitation refers to having to choose which set of data would be in focus due to time constraints. Besides all the videos, I have also collected children's drawings from my sessions, and this material had to be put aside for another round of analysis. With more time, this data material could have aided my analysis and provided further insights regarding how young children understand and depict their tablet play. This material is now saved for future analysis, hopefully, to take place after this book is complete.

The second limitation deals with the comparative characteristic of my study. Notwithstanding the similar behaviour observed in Japan and Denmark, the country sample does not constitute sufficient data to say that the similarities are universal or occur in other countries and contexts. In order to make such a statement, this study would need to be replicated in other countries or even other cultural contexts within my countries of choice. Despite the country constraint, the methodological approach chosen allows for other researchers to replicate the study in other contexts.

The third limitation refers to my contribution impact. Although proposed concepts are substantiated by my empirical data, they do not necessarily represent a huge shift in existing childhood related studies. These concepts helped me make sense of my data by offering a frame in which to assess the ways children interact with tablets. My choice of focusing on the hands led me to become aware of something otherwise not always visible, the role of the hands in creating an embodied knowledge in children's tablet play.

Lastly, the process of filtering many hours of videos into 25 codes and then into five final categories prompted me to revisit each and every code with a distinct lens. This process became my own *weaving*. During this *weaving*, I was able to find answers and ask further questions, besides also suggesting some concepts that composed my theoretical contribution. Another type of weaving might have propelled me in another direction.

Despite these choices and limitations, I believe my research contributes to reconceptualising how children's digital experiences are generally perceived. By acknowledging the range of learning taking place when children play with tablets, I suggest these encounters are not based on 'intuition' or intuitive, but they develop based on hours of encounters and seeing similar uses of these devices from children's own social context. Additionally, children engage in consecutive trial and error scenarios when using the device, leading to rapid learning. Playing is the method, the process towards, and the product of this learning experience. Consequently, as children engage some of their hours in digital playing, they build a body of knowledge about the device, characters, narratives and symbolic meanings, together with tactile subtleties apprehended by their hands, which shape their playful literacy.