Techniques of the tactile body: a cultural phenomenology of toddlers and mobile touchscreens

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The body-screen relationship may be one of the most significant relations to structure everyday practices. (Richardson and Third, 2009: 150)

Introduction
It is now commonplace for infants and toddlers to inhabit household media environments characterised by the presence of multiple and mobile touchscreen devices. Within these contemporary haptic media habitats, young children are interfacing with tablet computers and mobile phones through both guided design and situated play in ways that were restricted by past computer interfaces such as keyboards, mice, and game controllers. A key dimension of young children’s mobile media engagement and play centres on their embodied relations, and how these are shaped with and through the interfaces, materiality, and mobility of haptic media.

This paper explores these embodied dimensions of young children’s mobile media use, drawing on research from ethnographic observation of young children’s play practices in family homes, from analysis of videos of young children’s tactile media interaction shared on YouTube, and analysis of user interface (UI) and mobile app developer literature, such as the ‘Event Handling Guide for iOS’, which encodes touchscreen interaction through the design constraints and possibilities of gesture input techniques. Taking as its starting point Marcel Mauss’ famous reflection on body techniques, this paper draws on past and present research on mobile technologies, tactility, and everyday life, to explore what might be involved in developing a ‘cultural phenomenology’ of mobile touch screens. This research and analysis reveals the emergence of what could be described as a *haptic habitus*, or cultivation of embodied dispositions for touchscreen conduct and competence.

As we explore below, children’s haptic habitus can be seen to take shape through relational and distributed processes of encounter, enculturation, and embodiment. These are situated within the materialities of domestic media spaces and family relations of media provision and choreography in which haptic media play unfolds. Yet, this research also reveals how children’s haptic habitus is configured – enabled and constrained – by the commercial and design operations of mobile media, in which we see relays between cultural
contexts of use, user interface studies of children’s developmental capacities for gestural interaction, and the modulation of touchscreen settings by children’s app developers.

**Toddlers and mobile touchscreens – researching children and haptic interfaces**

There is relatively little research on young children’s mobile media use or play, which is in one sense unsurprising given young children’s historically limited engagement with, or capacity to use, older desktop devices and their associated interfaces. However, widespread mobile media penetration in the wake of Apple’s launch of the iPhone and later iPad, along with continuing developments in touchscreen interfaces are challenging these historical conditions, making digital media accessible to wider demographics of use, including young children. These conditions have prompted emerging strands of research into young children’s haptic media play, including research from social scientists working on media and communications to quantify the devices, activities and time spent by young children with mobile and touchscreen devices (e.g. Ofcom, 2013; Rideout et al., 2013), and to understand the qualities of these playful and embodied relations (Marsh et al., 2015, 2018; Nansen and Jayemanne, 2016; Nevski and Siibak, 2016). Alongside this social and cultural research is more political economy inflected research that seeks to review the design and marketing of children’s mobile application software products (Chiong and Shuler, 2010; Shuler, 2009). At the same time, researchers working in interaction design and user experience design (UX), are exploring young children’s gestural capacities to interact with touchscreen interfaces (Buckleitner, 2011; Hourcade et al., 2015) in order to inform user interface (UI) developments for child-friendly mobile software applications. Here, the term ‘Minimum User Competency’ (MUC) has been coined to characterise the lowering of usability thresholds to ever-younger populations of users for gestural and touchscreen interfaces – down to approximately 12 months of age, from the previous two-and-a-half years for keyboard and mouse interfaces.

These strands of research provide some insights into the content and contexts of young children’s mobile and touchscreen media use. Yet, there remains a lack of critical, theoretically anchored research that addresses how technologies, cultures, and bodies intersect and mingle in shaping the nexus of mobile haptic interfaces and toddler’s playful practices. In this paper, we seek to focus on these intersections and entanglements by applying insights drawn from cultural phenomenology to empirical and commercial data, in order to help understand how mobile technologies and tactility are operationalised within young children’s contemporary mediated lives. In particular, we draw on these theoretical insights to consider how young children are developing dispositions towards touchscreen media, a ‘haptic habitus’, through relations of encounter, enculturation and embodiment.

**Habitus du corps: a cultural phenomenology of the tactile body**

Habitus – broadly understood as the production and performance of bodily practices, as well as the ways such practices are acquired, embodied, and sedimented within shared
cultural dispositions or forms of conduct – is a useful if somewhat obvious theoretical foundation from which to consider emerging and evolving forms of haptic media. Marcel Mauss’s (1973) famous reflection on body techniques – *habitus du corps* – were based on observations of English troops’ inability to dig with French-designed spades during World War I. From these observations, Mauss located habitus at the intersection of bodily practices, object designs, and cultures of use, noting how particular forms of movement, from walking, swimming, sitting, and digging, were entrained and organised over time within specific cultural contexts through forms of repetition, interaction, and imitation. From this work, body techniques have come to be understood as ‘culturally and contextually specific – taught, learnt, and dynamically evolving’ (Richardson and Wilken, 2009: 24). Like Mauss’ anthropological work, Pierre Bourdieu’s social analysis understood habitus as a significant element of the intersection of culture and embodiment, in which dispositions are culturally shared and shaped through the activities and experiences of everyday life. Yet, Bourdieu’s focus on habitus was less attentive to the micro description of bodily movements, and, instead, more interested in the role habitus played in the relationship between individuals and their social environments. Opposing a notion that habitus was a purely involuntary entrainment of affect and identity, Bourdieu asserted people’s capacity to deliberately intervene and cultivate the formation and presentation of bodily conduct as part of the performance of social identity and class.

Phenomenology, with its focus on the body’s place within, performance through, and expression of relations to the materialities of cultural life, has also productively theorised the concept of habitus. Primarily understood as a process of embodied extension and internalisation, habitus emerges through the repeated use and embodiment of things. As Maurice Merleau-Ponty (2002: 145) explains in reference to the shaping of a keyboard habitus, ‘the subject who learns to type incorporates the key-bank space into his bodily space’. In phenomenological terms, the way in which repeated body-technology processes become habit – and part of our habitus, our ‘corporeal schema’ (Richardson, 2012: 135) – ‘expresses our power of dilating our being in the world, or changing our existence by appropriating fresh instruments’ (Merleau-Ponty, 2002: 143). Thus, for Merleau-Ponty habit is not simply an involuntary or rigid pattern of individual behaviour, but, rather, an empowering relationship between bodies and artifacts that expresses our capacity to adopt and adapt to technologies, to embody them, and, in the process, re-shape our engagement with and ability to act in the world. In exploring these concerns, Merleau-Ponty identified three layers of habit – biological, movement and cultural – that have implications for people’s varied capacities to interact with or appropriate new technologies. These layers of habit relate to the physical abilities of bodies, to learned forms of bodily movement, and to cultural experience in the acquisition of technological instruments. For Merleau-Ponty (2002: 145), the typing body habituates to keyboard use when the corporeal schema is distributed in the fingers and limbs, performed through their dexterity and motility, and learnt through past experiences of use. Such phenomenological reflections have been taken
up within the contexts of human-computer interaction (HCI) research, which notes how appropriating gestural interfaces requires levels of physical ability, learned and controlled bodily movements as input, and situated meanings of use (e.g. Loke and Robertson, 2011; Nansen et al., 2014).

Placing such phenomenologically oriented approaches within a more explicit media studies frame, Ben Highmore (2011) has argued that habitus is a productive concept for understanding how our senses accommodate or habituate to the complexity of contemporary media and information environments. Drawing on Walter Benjamin’s notion of apperception, which sees the automated embodiment of sensations and knowledge as enabling human capacities to engage with new and changing technological experiences, Highmore turns to contemporary media environments to discuss his own habits of media interaction: ‘I can perform fairly complex operations on a computer while also successfully following a TV show that has a number of intertwined narrative threads’ (Highmore, 2011: 134). In this way, he draws on personal and descriptive reflection to challenge effects discourses around things like screen time, pathological media use, or information overload to suggest habitus can operate as an embodied resource – distributed amongst the senses, and in relation to the materiality of media – to allow for attention to be delegated, scattered and distracted in ways that foster new forms of media relations to emerge. Highmore (2011) argues that the habituation of experience and the embodying of knowledge – ‘to the hands, the feet, the nervous system and to the field of apperception’ (134) – frees-up the senses and builds capacity for adopting new, unfamiliar or changing technologies.

This trajectory of analysis and theorising habitus and its technocultural dimensions is evoked in what has since been characterised as ‘cultural phenomenology’ (Richardson and Third, 2009; Connor, 2000; Csordas, 1999). Cultural phenomenology has been described as a ‘methodological attitude’ – a critical disposition rather than a formal method – ‘that demands attention to bodiliness’ (Csordas, 1999: 148) and body-technology relations (Richardson, 2012; Richardson and Wilken, 2017), which calls for ‘somatic modes of attention’ that ‘highlight the engagement of sensory modalities’ (Csordas, 1999: 151), including touch. Like visual and digital ethnography (Hjorth et al., 2017; Pink et al., 2016; Pink, 2009, 2001), cultural phenomenology seeks to ‘critically account for the perceptual and sensory dimensions of everyday material culture’ (Richardson and Third, 2009: 49), particularly ‘the haptic, gestural, and embodied appropriation’ (49) of mobile devices.

This approach has a clear affinity with postphenomenology, which seeks to understand human-technology relations through situated negotiation and multi-stability. Here, the influential work of Don Ihde (1990, 1993), which understands embodied relations as one of a type of interrelation forms – including alterity, hermeneutic, background – has provided a productive lens for considering various technologies, including mobile media and
haptic interface interaction (Wellner, 2016), which connect to a broader ‘material turn’ in the study of haptic mobile media (Mowlabocus, 2016; Richardson and Hjorth, 2017; Parisi et al., 2017). Yet, in bringing together phenomenological and cultural studies traditions, cultural phenomenology aspires to a more culturally-situated analysis of human-technology relations than is offered in the post-phenomenological tradition. On the one hand, it seeks to ‘articulate the worldliness and embodiedness of experience’, to ‘heed the affective, somatic dimensions of cultural experience’ (Connor, 2000: 3). And, on the other hand, it seeks to synthesise ‘the immediacy of embodied experience with the multiplicity of cultural meaning in which we are always and inevitably immersed’ (Csordas, 1999: 143). This is to say that cultural phenomenology ‘resituates embodiment and materiality within sociocultural contexts’ by turning our attention to ‘the body-technology relations that emerge from particular cultural milieu and collective habits’ (Richardson and Wilken, 2017: 120-121). With respect to these body-technology relations, Steven Connor (2000: 4-5) suggests that cultural phenomenology might offer an approach that makes it ‘possible to say interesting and precise things about our relation to the many quasi-objects of our intimately, or extimately, technologised world – dashboards, joysticks, screens, wires, keyboards, mouses, say, and what they did to and with hand, eye and skin – that would start from somewhere else than the to-hand folksiness of the woodcutter’s axe or the cobbler’s needle, or the abstract allure of “the commodity”’. Such phenomenologically-informed cultural theory around habitus and body-technology relations forms a productive way of understanding young children’s encounters, enculturation and embodiment of touchscreen media offered in this paper. This dual orientation towards habitus and cultural phenomenology is valuable insofar as it turns our attention to everyday, often residual, and easily overlooked media encounters, to the ways we inhabit media ecologies made of old and new, visual and tactile, infrastructural and artefactual, and so on – ecologies that involve diverse, dense, and interconnected forms of experience. More specifically, it highlights the importance of attending to the specificity of tactile interactions, the conduct of bodies, the technologies mediating interaction, the cultural practices surrounding and shaping these activities, and the wider communities of interest accommodating, representing, designing, or commodifying these relations.

In order to develop a cultural phenomenologically informed account of toddlers and mobile touchscreens, this article draws on three distinct strands of research informed by broader digital ethnography research approaches, and, in particular, the notion of ‘haptic ethnography’ (Richardson and Hjorth, 2017), which seeks to deploy multiple methods to situate, capture, and document how embodied relations with and through mobile media and haptic interfaces become habituated: (1) ethnographic observation of young children’s play practices in family homes conducted with children aged from birth to 5 years old ($n = 41$) in their domestic media settings in Melbourne, Australia, during 2016-17; (2) analysis of online videos of young children’s touchscreen media interaction shared on YouTube, and in
particular videos selected from a sample using the search term ‘iPad Baby’; and, (3) analysis of the user interface (UI) and mobile app developer literature, such as the ‘Event Handling Guide for iOS’, which encodes touchscreen interaction through the design constraints and possibilities of gesture input techniques.

Combining these theoretical and empirical lines of inquiry, this article explores the cultivation of young children’s embodied dispositions for touchscreen conduct and competence – what we are calling their haptic habitus. The following analysis is structured around the relational and distributed processes of encounter, enculturation, and embodiment. These are situated within the materialities of domestic haptic media spaces and family relations of media provision and choreography, in which haptic media play unfolds, as well as online spaces of video sharing, in which these bodily practices are culturally produced, represented, and contested. The analysis is also concerned with how, in turn, these spaces and practices are enfolded into wider communities of design, development, and commercialisation, in which we see relays between cultural contexts of use, user interface studies of children’s developmental capacities for gestural interaction, and the modulation of touchscreen gestural events by children’s app developers.

Children’s media lives – acquiring a haptic habitus

Encounters

The household research highlighted by-now-familiar arrangements of mobile media in homes, in which young children inhabited spaces of media domestication and dwelling, where the mobility of devices meant they were not often located in a fixed place but circulated around the home through routines of use and disuse that facilitated young children’s encounters:

We’ve got an iPad, which just floats around anywhere.¹

Yeah, so they kind of just sort of inherited stuff that was around, so rather than going and buying them a device, they just kind of picked up the things that were laying around.

Touchscreen media, then, come to inhabit homes in ways that become readily available but also appealing for young children to use through the affordances of the interface responding to their touch, the lighting up of screens:

He reaches for screens if he sees them.

And he notices when the lights, the bright light. A little bit, little bit moth to a flame, you know.
These routinised encounters with touchscreen media habituate young children to their ubiquity and ready availability. What is more, these encounters give young children a clear sense of the cultural importance of what Lucas Introna and Fernando Ilharco (2004: 227) call ‘screen-ness’ – the ‘already presumed relevance of [touch] screens’, and the way that they ‘call for attention’ and make apparent ‘a way of living’.

*Enculturation*

The materialities of these media habitats and touchscreen encounters were moderated by cultural practices of mediation, in which family media routines and rhythms meant young children become habituated to regularly seeing mobile devices around the home, but also through observing their parents’ embodied, distracted or intimate relations with their phones and tablets (see Mowlabocus, 2016). Through these observations, children become enculturated into understanding that, ‘in contemporary life, screens are often a primary focus of our attention and concern; they literally display that which is relevant or worthy of notice’ (Richardson, 2008: 69):

‘cause he notices that we pick up this black thing.

The other day he found... he got his mum’s phone and starting going, ‘Lala-lala’, talking.

I, I suppose indirectly he’s fascinated... he notices when our attention is drawn by it.

In addition to such indirect forms of habituation, discussions with parents identified more deliberate practices of providing children with mobile devices, so-called ‘passing-back’ (Chiong and Shuler, 2010), in order to ‘pacify’ them in situations where they were otherwise occupied, such as driving, working, or socialising, and thus deployed as a tool of distraction or management within the routines of family life:

Um, so it’s kind of hard like you say, like sometimes you use devices to pacify them, so you’re busy, you know doing ... your activities or work or something.

...on my phone and she’ll watch a show if I’m out somewhere. It’s usually a ... I use it like a tool to entertain her...

Yet, such parental provision of devices – and subsequent child familiarisation and habituation of mobile media – was not simply an expression of what Mowlabocus (2016, n.p.) describes as the hail of smartphones ‘reminding us to be productive ... as workers, students, parents, friends, consumers, and producers’, in which ‘their constant notifications interpellate us into the contemporary political-economic structure from an ever-earlier age’. Instead, such attachments also reflected the value placed on digital content or
communication within young children’s lives, especially family photographs, and mediated video communication with relatives:

_We had my son’s birthday and there were some photos, some footage of us singing happy birthday and the little one just wants to watch it over and over again. She thinks it’s fantastic watching herself._

_We quite often just have them [on Skype] … have the computers in there while we’re having dinner … the laptop will be there, opened up at one end of the table with the family here and there will be my sister having breakfast with her family in Ireland … the kids are running around and playing with each other, they’ll pop in and say, ‘Hi’._

Such parental mediation facilitated children’s initial encounters with mobile media and touchscreen devices, as well as their ongoing enculturation into a shared culture of mobile media use, in which the everyday and ordinary usage of haptic media slowly seeped down to younger children’s everyday media practices.

**Embodiment**

Young children are no longer necessarily ‘sat’ in front of static media; media are more mobile and circulate around them. Within reach, media encounters are entangled with and animated by touchscreen interfaces that are responsive to the gestural actions of young children, and by their mobile affordances for being held, touched, and carried. In a sense, then, a haptic habitus addresses the ways mobile devices and touchscreen interfaces become embodied through habitual modes of seeing and engaging with the media interfaces around them, and how young children interact with but also incorporate media devices within their bodily practices and as part of their ‘individual and collectively realized corporeal schema’ (Richardson, 2012: 135):

_They can scroll, because I know that they like scrolling, they love scrolling through my photos on my iPhone … she can do it, once I’ve unlocked._

_The phone is 100% instant and it’s little, they can carry it around, so I think that’s part of the attraction as well._

In our research with young children in family settings, the *swipe* emerged as the key gesture of a haptic habitus. Like Merleau-Ponty’s keyboard habitus, the swipe is expressive of young children moving from infant gestural excess to specific learnt modes of embodied touchscreen interfacing. The swipe emerges as critical in the transition from simple and intuitive discrete interaction to more encoded multi-touch gestural styles. The swipe is embedded within touchscreen habitats, takes shape through processes of habituation, and is internalised as a particular mode of gestural input for corporeal conduct as part of a wider haptic habitus:
They can grab it and start playing with it. It just shows that it’s so much part of their world … to swipe something.

She knew from quite a young age to swipe a photo on the phone.

He has been using an iPad before he was 1. He could unlock it. He could open things with it. Play games. Choose apps. Before he could talk or walk. It’s such an intuitive interface.

This habitus speaks to the emergence of young children’s embodied capacities shaped through the dominance of a particular interfacial mode of media engagement. The formation of an embodied disposition or habitus characterised by touchscreen interfaces guides orientations towards media technologies more generally. This is operationalised by, for example, an expectation of resemblance driving attempts to touch legacy media and residual interfaces through standardised gestural interaction modes; or, alternatively, animating a sense of difference between computational devices, underscoring the nomenclature of ‘natural user interfaces’ within the product design and manufacturer communities (e.g. Norman, 2010; Widgor and Wixon, 2011):

It’s funny because when she was younger she would go up the T.V. and she would try swiping the T.V. to turn the channel.

...at a relative’s house and they were looking at a bunch of old photos out on the table and one of their toddlers came up and tried to swipe the photos … they were physical Polaroids!

The, the keyboard in my office is a big novelty… So, it’s a novelty, that, I think that they actually don’t see the computer and the tablet as similar devices.

Whilst the swipe – whether of touchscreen devices, or of other ‘residual media’ (Acland, 2007) – speaks to the formation of young children’s haptic habitus and embodied capacities to interact with media, and an ‘intercorporealization’ of specific gestures ‘within the patterns and contextures of everyday life’ (Richardson, 2012: 147); it also highlights how modes and means of interfacing with media are constrained and guided by particular and codified regimes of interaction involving design and development, which we return to later in the paper. Before doing so, however, it is important to explore how such embodied capacities, in cultural phenomenological terms, are culturally encoded or ‘enculturated’, whereby parents make available, model behaviour, and mediate their children’s mobile interactions. This is not just an inevitable outcome of mobile media being picked up, and
played with, but also one that is actively constructed – something we see in videos that are shared on YouTube.

‘iPad Baby’ videos – the cultural production of a haptic habitus

The ‘iPad baby’ video genre analysed in this research were found in YouTube using search terms combining technologies (e.g. ‘touchscreen’, ‘tablet’, ‘iPad’) and the young child demographic (e.g. ‘baby’, ‘infant’, ‘toddler’). These searches produced overlapping results, with ‘iPad Baby’ returning many thousands of results, which were filtered by View Count, and sequentially screened until saturation reached. From this larger corpus of videos, two of the most viewed videos that exemplified key elements of the genre of iPad baby videos were selected for close analysis (see: Nansen and Jayemanne, 2016). The iPad baby genre of videos is mostly presented in short recordings and in-home settings; there are varying approaches to narration within these videos, but, typically, the recorder remains silent and lets the camera observe the child’s activity. These videos show young children encountering tablet computers, mostly iPads, and how they interact with these touchscreen interfaces, mostly through banging and tapping, though also by licking, shaking, and sometimes swiping (Hourcade et al., 2015). The apps used by children in the videos include a range of educational and gaming apps typically involving music, counting, reading, and drawing. The iPad baby genre has the feel of documentary footage in which parents are recording important milestones in their baby’s development, like their first steps, though here the video is of the baby’s first app use. In the discussion to follow, we draw out two contrasting examples of this genre.

Despite their ostensibly naturalistic representation, these videos are clearly constructed arrangements, in which infants and/or the tablets are almost always propped up in some way, either held by an adult, or set-up on a bed or couch with supporting cushions and so on. In this way, the conditions of assembly in many ways contradict the affordances and logics of mobile media with young children’s bodies immobilised to create the conditions for their haptic mobility to emerge (Wellner, 2016). And so it is not surprising that such situations sometimes break down, with either the iPad or baby falling out of position. In addition, there are clearly a number of production techniques that highlight the constructed and performative dimension to these videos. One video, titled ‘A Magazine is an iPad That Does Not Work’, for example, presents footage of a baby girl playing with an iPad, which is then contrasted with scenes of her trying and failing to manipulate the pages of a magazine. This video is highly edited with heavy use of explanatory intertitles that make claims about her affective response to traditional media: that is, she is disappointed or unengaged by older magazine media that do not feature an interactive surface that can be swiped, pinched and so on. Through its editing and intertitles, this video advances a specific argument about the ease of use and intuitiveness of a touchscreen interface: because the touchscreen is a ‘natural user interface’ that utilises gestural movements, even a baby can use it. The video, then, affirms the so-called ‘minimum user competency’ (MUC) with clips
of the baby girl alongside paratextual framing and intertitle commentary that asserts her capacity to swipe and thus interact with contemporary haptic media:

For my 1-year old daughter, a magazine is an iPad that does not work. It will remain so for the rest of her life. Steve Jobs has coded a part of her OS … Medium is message. Humble tribute to Steve Jobs, by the most important person: a baby.

The video seeks to convince viewers that a shift is taking place between two media epistemes. More than simply attesting to the design qualities or usability of the interface, the video makes a claim about contemporary media conditions and their impact on the construction of subjectivity, and of children’s capacity to ‘intertwine with the world, to integrate, internalize or intercorporealize seemingly external objects’ and ways of doing into their corporeal schema (Richardson, 2012: 135).

In contrast to this style of video, in which the operations of construction are made visible through post-production editing of footage to make an argument about a child’s playful capacities and repertoire, there are others in this YouTube genre that revolve around parental attempts to ‘direct’ or ‘edit’ the child’s performance. The video ‘Baby Works iPad Perfectly. Amazing Must Watch!’, for example, shows a two-year-old boy sitting on an armchair playing with the iPad in his lap, whilst the father can be heard off-camera encouraging him to demonstrate his favourite apps, and praising his performance (e.g. ‘You’re so smart!’).

‘Baby Works iPad Perfectly. Amazing Must Watch!’ signals a different mode of editing that addresses the performance of the child rather than video production. It is shot in a continuous fashion, and it contains many of the vernacular signifiers of a naturalistic event, with shaky hand-held camera work, an everyday domestic setting, incidental lighting, unedited sound and footage. Yet, it is also a clearly and deliberately staged scene, with the child positioned on an armchair with the iPad in his lap, whilst the angle of the shot is framed to provide a clear view of the touchscreen and child’s gestures. In addition to the deliberate set-up of the scene, the video provides an exemplary, if exaggerated, expression of the standard generic tropes of parental guidance and encouragement. The father can be heard clearly throughout the video verbally instructing and prompting his son to demonstrate his favorite apps, and reveal his ability to navigate between app icons on the home-screen. The verbal prompting and directing of the child’s actions reveals the child is revisiting and rehearsing well-worn patterns of app use. This can be seen when the child plays a video and begins scrolling forward, and the father asks, ‘You’re looking for the monkey part, aren’t you?’ ‘You’re looking for your favorite part.’ There is, then, a sense in which not only is the present recorded action directed, but that this interaction has been practiced, or perhaps even trained, over time to become habituated.
In these two contrasting examples of young children’s touchscreen use recorded and shared on YouTube, we see efforts to represent the infant as a touchscreen native who possesses an innate digital disposition, yet closer observation reveals how they are carefully constructed, either through editing the production or through editing the performance. In these videos, parents are not simply recording a toddler and touchscreen play. Instead, the production and sharing of these videos gives rise to a much more complex set of relations in which parents act as intermediaries within the embodied, technical and cultural configuration of children’s mobile media use. This situation is, then, assembled through the mediating role of parents, the presence of a recording device, the architecture of the internet and YouTube platform – all gathering around the infant-interface interaction (see Nansen and Jayemanne, 2016).

**Designing for haptic habitus and the capturing of infant gestures**

Whilst children’s haptic habitus is clearly an embodied relation, which emerges through physical encounters, playful interaction, and other familial experiences, we can also see that it is shaped through process of enculturation operating within both situated and networked contexts. Much like the layers of habitus Merleau-Ponty has identified earlier in shaping people’s varied capacities to interact with or appropriate new technologies – biological, movement, and cultural – the contemporary haptic habitus of children can be seen through a cultural phenomenology lens that accounts for both the sensory, physical, and bodily dimensions of interaction, as well as their embedding within circuits of culture involving places and routines of family life, as well as wider forms of representation and discursive configuration via social media.

As the discussion of young children’s touchscreen habitats and habituation above suggests, the formation of young children’s touchscreen *habitus* emerges through their embodiment and enculturation of dispositions towards touchscreen media shaped by direct experience (responsive interfaces, interactive content, tactility of the media), by rich household media environments (multiple and mobile devices, internet connectivity), through mimesis and mediation (observing and imitating, fitting within family media practices, and gestural and other bodily adjustments), *and* through networks of content distribution and representation (online videos, associated comment threads, and so on). Here, the haptic interface is understood not solely as the point at which the user interfaces with the computer screen, but as Cramer and Fuller (2008) argue, the interface becomes a site of exchange which operates below the level of the user interface through hardware, software, code, and protocol within computer systems, as well as beyond the screen through shared practices and norms operating at the level of culture. Such dispositions are clearly located within and informed by wider cultural contexts in which young children’s use of touchscreen devices are enacted, represented, and normalised.
Cultures of use, however, are not only limited to end users of haptic media, but also become available by circulating online as a resource for other communities, including haptic interaction designers. Acts of reinterpretation or repurposing emerge through, for example, the use of these videos by interaction designers and product developers to understood infants’ interface capacities, which serve as a resource that can be leveraged to inform the further development of touch design in commercial mobile apps (Buckleitner, 2011). The ‘iPad baby’ videos, for example, have been used to (re-)inform design research and baby app product development and commercialisation for a growing market of increasingly younger children (Buckleitner, 2011). Such design research analyses these videos and provides a taxonomy of children’s touchscreen gestural capacities, whilst also revelling in the technical detail of the interface and its possibilities for capturing infant attention:

*A perfectly flat, glassy surface is magical all by itself. It doesn’t exist in nature ... and when it’s covered with fog or a slippery oleophobic coating, it gets even more interesting to your fingers...*  
*The Minimum User Competency (MUC) has dropped from around 2½ years (for the mouse) to around 12 months (for the iPad)...*  
*This presents new opportunities for children’s interactive media developers; nothing short of a new era in computing, as the user interface becomes increasingly invisible.* (Buckleitner, 2011: 10)

These haptic interfaces, therefore, are not only helping to re-shape the ways children interact with computers, but, via parental sharing to social media sites what are ostensibly intimate domestic moments of children’s haptic play, they also become a commercially valuable resource for informing interaction design and haptic software product development. Using YouTube videos to analyse infants, toddlers and young children’s abilities to use touchscreen devices, locates children’s haptic habitus within wider cultures and economies of play, or what Galloway (2012) calls ‘ludic capitalism’.

For children, the ‘specific body-technology coupling is far from settled’ and requires ‘continuous perceptual negotiation and adaptation’ (Richardson and Wilken, 2017: 116) of their haptic senses. Thus, a common and not unexpected observation in this research is that infants’ initial modes of device interaction involve actions such as jabbing, swatting, licking, and smearing (e.g. Buckleitner, 2011). While ‘looking, tasting, smelling, and hearing’ – alongside jabbing, swatting, and smearing – ‘are all variants of “handling” the world’ (Richardson and Third, 2009: 154), in design terms such infant object exploration can be understood as a form of gestural excess (Apperley, 2013; Simon, 2009), inasmuch as these gestures exceed and therefore are not clearly registered within the codified regime of the touchscreen interface. To be registered, gestures must map onto the predefined and limited range of common UI (user interface) gesture types (tapping, pressing, swiping, dragging, scrolling, pinching, spreading, rotating) (see Figure 1), these are informed by such recursive
examples of UX research, and, in turn, designed, detailed and determined by product manufacturers such as Apple, and made available for software developers through API’s and documentation such as Apple’s ‘Event Handling Guide for iOS’.


Pre-prescribed touchscreen gesture combinations transform the way children experience their “being” and “doing” in the world’ (Richardson, 2012: 147). For young children, touchscreens (and mobile devices more generally) require subtle yet significant reformulations of, adjustments to, and disciplining of, body-technology couplings (Richardson and Wilken, 2017: 118). As Ingrid Richardson (2008: 75) puts it, ‘The mobile device is simultaneously – and often equally – an aural, visual and haptic interface, requiring an evolving sensibility and inter-modal literacy’. With children, this literacy involves learning through doing whether their fingers have moved far or fast enough, or in a straight enough line, to activate on-screen actions – that is, they must discover and then adjust their actions to accord with and map onto those movements incorporated within predefined gesture recognition lists.
And yet, young children’s capacities to deliberately interact with touchscreens are fairly quickly acquired. Beginning from around the age of 12 months, children demonstrate abilities for simple discrete types of single-fingered gestural interaction such as tapping and swiping (or flicking) (Cristia and Seidl, 2015; Hourcade et al., 2015). More complex and multi-touch gestures, such as dragging or pinching, are, whilst slower to develop, displayed from around 18 months and steadily increase over time (Hourcade et al., 2015). The ability to use touchscreen devices, however, is not simply determined by children’s developmental capacities, with research showing that such digital dexterity operates within feedback loops involving parents deliberately assembling the interface between child and touchscreen through the provision, positioning and promotion of mobile devices and applications (Nansen and Jayemanne, 2016). Similarly, the so-called ‘Minimum User Competency’ (MUC) of touchscreen interfaces is not simply a product of touchscreens automatically lowering thresholds of computational usability to ever-younger populations, with research on children’s capacities for gestural interaction purposefully fed back into UI development in order to foster both the design of child-friendly software applications and extend the market of potential users (Buckleitner, 2011).

Children’s haptic habitus, then, becomes a site of interest not only for proud parents or cultural researchers, but also for UX and interaction design researchers aiming to build applications for play and learning that accommodate these capacities through programmed tolerances for gestural input techniques. UX and interaction design researchers are implicitly interested in how developmental capacities intersect with forms of encounter, enculturation, and embodiment as part of the dominant interface now reconfiguring children’s media dispositions and habitus, in which young children are growing up in media environments defined by increasingly intimate and entangled haptic computational experiences. Habitus could be viewed as an implicit dimension to human-centred design traditions, with a focus on user experience and accommodating design within existing modes and patterns (habits) of activity (e.g. McCarthy and Wright, 2004). Nevertheless, perhaps the most significant context in which habitus emerges as a critical aspect of design research and innovation is in the development of increasingly haptic interfaces. Whilst it is recognised by both HCI and media scholars that haptic media and gestural interfaces are not unique to our current moment of digital mobile media (Norman, 2010; Parisi et al., 2017), drawing on past regimes of interaction such as GUI (graphical user interface), they are nevertheless part of a NUI (natural user interface) apparatus that imagines a renovated experience of computer interaction by incorporating people’s natural modes of physical communication and movement. That is, haptic gesture interfaces are seen to be in tune with people’s existing and everyday bodily movements. In this sense, the interface is imagined as invisible and seamless with people’s natural ways of moving in a manner that habituates to us rather than the other way around.
This new paradigm of interaction has, however, been critiqued for the assumption that such interfaces are somehow intuitive, universal and immediately usable (Norman, 2010). Rather than a mode of interaction that comes naturally, Donald Norman argues that gesture systems still require designing a grammar of interaction that follows well-defined modes of expression and navigation. Thus, like any other mode of interfacing, haptic media are still subject to entanglements of design protocols and learnt user practices in which specific gestures must become habituated – something he discusses in relation to problems encountered by early Wii-mote users who broke television screens by letting go of the controller rather than the button. Designing for young children’s haptic habitus, then, may appear to be a simple task for UX designers of codifying children’s gestural capacities onto touch-based user interfaces. Yet, as this article has argued, such gestures exceed biology through the experience and enculturation of technology; they are not stable, rather they require ‘continuous perceptual negotiation and adaptation’ (Richardson and Wilken, 2017: 116) and are ‘culturally specific and materially contextual’ (Richardson and Third, 2009: 155). Designing for habitus, then, is not resolved by simply designing physical interfaces that utilise gestures or movement for input, as haptics are both specific too and produced within different bodily, technological, and cultural contexts.

In discussing these conditions of encounter, enculturation, and embodiment, parents reflected on the significance and implications of such changing media interfaces and experiences. Importantly, whilst not necessarily having theoretical language at their disposal, parents often touched on critical elements of cultural phenomenological interest and notions of habitus in discussions of sensation, affect and subjectivity in the touchscreen relations observed in their children. These were understood as both extending and attenuating possibilities for perception and engagement with the world:

*I think that in some ways it (touchscreen) makes them feel more connected to the device, like they’re more part of what they’re doing... They’re more in the, they’re more in their moment with the device, because they’re, they’re doing it, ’cause I think in mouse and keyboard, probably a little more disconnected.*

*The other thing is, with the iPad, you don’t get texture. You don’t sort of feel, you know, if you’re using sand, or if you’re using tissue paper, or you’re using Play-Do, or whatever, you’re actually getting different textures to feel. It’s definitely missing a sensory input to it. Yeah.*

These observations highlight shifting but shared media subjectivities entrained through an emergent haptic habitus in terms of dispositions and expectations for immediacy, for availability, and for connectivity in the operation of digital media. Paradoxically, whilst such reconfigurations enable new modes of experience not available through older interfaces, the touchscreen interface also installs anxieties about the erasure
of sensory engagement afforded by more traditional modes of physical play and learning. These expressed tensions around the re-distribution and re-valuation of sensory experience structured through young children’s everyday intimate touchscreen interfacing are, in turn, folded into broader contradictions and tensions within cultural theories of media haptics and habitus. On the one hand, acquiring capacities for using touchscreen interfaces equips young children with embodied resources for apperceptively relating to and through digital media (Highmore, 2011); on the other hand, touchscreens inscribe or ‘brand’ bodies with codified gestures for manipulating interfaces (Parisi, 2015), maximizing the efficiency of gestural communication within corporate systems of interfacing at the ‘cost of the autonomy of gesture’ (Zehle, 2012), and thus delimiting the potentials for children’s expressive communication and diversity of tactile media culture.

Conclusion

In this article, we have suggested that applying phenomenologically-informed cultural theory around habitus to technology relations may be a productive way to approach young children’s encounters, enculturation, and embodiment of touchscreen media. Drawing on cultural phenomenology, this article has explored the formation of an embodied disposition or habitus towards touchscreen interfaces. We have shown how this haptic habitus is produced through the accumulation of situated and intimate experiences within everyday domestic life, as well as their embeddedness within wider cultural sites of circulation, and their appropriation by haptic user interface designers and product manufacturers.

This research has relevance for research on children’s media, adding qualitative and theoretical insights to the existing quantified data on infants, toddlers, and young children’s increasing use of mobile and touchscreen media. The touchscreen habitus described, speaks to the emergence of young children’s embodied capacities, but also sensory and subjective constraints shaped through the cultural dominance of this particular interfacial mode of haptic media engagement. Such cultural phenomenologies of touchscreens shape the experiences, meanings and values associated with mobile device use by young children. This conceptualisation raises important questions about the significance of culturally dominant interface forms in reconfiguring dispositions and habitus, especially for young children growing up in media and information environments defined by increasingly intimate and entangled haptic media experiences, and the uses to which they are put. As theorists and researchers, our critical understanding must be informed by, and account for, the confluence of micro-practices (what children do) and macro-process (what children are permitted to do by design) and the cultural phenomenological complexities of both.

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Notes

1 All quotes are anonymised participant quotes from parents interviewed as part of the ethnographic research conducted in domestic media settings in Melbourne, Australia, during 2016-17.

2 UserExperienceWorks (2011). Available at: https://www.youtube.com/watch?v=aXV-yaFmQNK

3 Original video published by Mike Wilson Tunes (2010) no longer available; but reposted by other YouTube channels. E.g.: https://www.youtube.com/watch?v=rPf5TgcL30w

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