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Valuing digital possessions: the role of affordances

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Abstract

In this article, we introduce an affordance-orientated approach for the study of digital possessions. We identify affordances as a source of value for digital possessions and argue that dominant meaning-orientated approaches do not enable us to fully appreciate these sources of value. Our work recognizes that value is released and experienced in "the doing"—people must do things with digital objects to locate and obtain value in and from them. We distinguish three levels of affordance for digital possessions—low, mid, and high—and introduce the concept of digital incorporation to explain how the three levels of affordances come together, with the individual's own intentionality to enable the achievement of goals. We draw from postphenomenological interviews with 47 individuals in the UK to provide a possession-based and lived experience approach to affordances that sheds new light on their vital role in everyday life and goals.

Keywords: digital possession, affordances, value, meaning, appropriation postphenomenology

Introduction

Computer-mediated communication (CMC) studies have shed much light on how digital matter (platforms, content) is used. While our understanding of use has been deepened by studies on *what* technology can afford and *how* it can enable and enhance human action (Sundar, 2020), the value people ascribe to this affording potential is little known. In this article, we argue (and provide evidence for) that a way of connecting *use* with *value* is to approach our transactions with digital things as targets of possession. Possessions are anything—cars, content, apps, art, furniture, pets—that a person sees as "theirs" even when legal ownership is absent (Belk, 1988; Pierce et al., 2003). Through processes of contagion or habituation, as well as purposeful investment of psychological energy to realize goal-directed intentions (Csikszentmihalyi & Rochberg-Halton, 1981), some possessions are cultivated with indexical meanings that people want to preserve as they provide a spatio-temporal link to past selves, places, events, and important others (Grayson & Schulman, 2000). Among all items that enter the sphere of personal possession, only a handful are personally valuable because they extend the self symbolically or in its ability "to do" (Belk et al., 1989; Richins, 1994).

The merit of enriching CMC studies with a possession lens is that it is commensurate with people's experiences. In the everyday, digital things—bits of code such as documents, apps, skins, playlists, photos, in-game items, and accounts—are referred to as "mine" and therefore studied as digital possessions. Further, that people develop feelings of possession for digital things is well-evidenced in other fields (e.g., Belk, 2013; Denegri-Knott et al., 2020; Odom et al., 2011; Watkins & Molesworth, 2012). Our everyday interactions too are personalized to encourage possessory attachments and are increasingly transactional in nature. In 2021, $24.9 billion was spent on non-fungible tokens (NFTs; *Forbes*, 2022), the average time on mobile phones across 10 global markets increased to 4.8 hr a day and spending on apps rose to $4.3 billion, with $320,000 spent in app stores every minute (App Annie, 2022).

Despite these increments, available studies have concluded that when asked to compare them to their material possessions, people will value digital possessions less (Atasoy & Morewedge, 2018; Helm et al., 2018; Siddiqui & Turley, 2006). Often, this has been reduced to the visibility and persistency of material possessions which provide a reliable vehicle for meaning retrieval (Grayson & Schulman, 2000) either through kinetic action (use) or through contemplation (Csikszentmihalyi & Rochberg-Halton, 1981). Thus, when compared to digital equivalents, available studies (Atasoy & Morewedge, 2018; Belk, 2013; Petrelli & Whittaker, 2010; Siddiqui & Turley, 2006) have concluded that material possessions are more valuable. Such conclusions are enabled by assumptions inherited from meaning-oriented approaches dominant in the study of material possessions.

A first assumption is that use is a weaker source of value than indexical meanings (Grayson & Schulman, 2000). Although possessions can be treasured for their utility, like young people who value their sports equipment to express skills and develop autonomy (Belk, 1988; Csikszentmihalyi & Rochberg-Halton, 1981), use is also deemed a potential source of symbolic pollution (Belk et al., 1989). We observe this most prominently in material attachment studies concluding that a defining feature of weak attachments is that they are based on purely utilitarian grounds (Kleine & Baker 2004). Prefigured by these conclusions, arguments, to the effect that people's relationship with digital objects is ephemeral and their valuation, centered on meeting fleeting use-needs without lingering attachments, have gained traction (Bardhi & Eckhardt, 2017; Belk, 2013). Another assumption is that, in having a singular and physically stable composition, material objects provide opportunities for meaning generation and retrieval in ways that digital artifacts cannot. Meanings, in being transient, are seen as

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requiring firm and singular anchorage for their substantiation and preservation over time (Csikszentmihalyi & Rochberg-Halton, 1981; McCracken, 1986). Since digital possessions lack singularity and have a lesser physical presence, they are deemed less likely to become a part of the extended self (Belk, 2013; Helm et al., 2018) or stable vessels of meaning (Petrelli & Whittaker, 2010).

A way of overcoming these limitations, suggested by Belk (2014), is to shift attention from *meaning* to *affordances*. We do this by proposing an affordance-based lens to understand individuals' valuation of their digital possessions. We define affordances as enacted properties in use that in varying degrees enable or constrain a person's ability to achieve goals and intentions, subject to that person's ability to perceive, value, and execute given intentionality (Costa, 2018; Evans et al., 2017). Drawing from Human-Computer Interaction (Hassenzahl, 2010), media studies (Bucher & Helmond, 2017), and postphenomenology (Ihde, 1990; Rosenberger & Verbeek, 2015; Verbeek, 2016), we identify three integrative elements to goals and affordances—high-level (congruency between goal and digital possession), mid-level (intention-platform dynamics) and low-level (competency-features).

Based on data gathered via postphenomenologically-informed interviews with 47 digital media users living in South and Central England, we make the following contributions: First, we find that for digital possessions, lack of indexical meaning is not experienced as a reduction of value. Where objectual characteristics like lack of durability and visibility had been deemed as detracting value from digital possessions (e.g., Belk, 2013; Odom et al., 2011; Siddiqui & Turley, 2006), we show how digital possessions can be experienced as valuable when transparent-in-use and that affordances, rather than only accrued meanings, are salient components in this evaluation. While work in CMC has dealt with defining and identifying affordances (e.g., Evans et al., 2017), the values that individuals ascribe to them and the lived experience of how affordances are integrated into goals and their realization has been less of a focus.

Second, we argue that value is not only released via contemplation (as is mostly the case for material possessions) but via a process we term digital incorporation. By digital incorporation, we mean the contextually situated coming together of human and technological intentionalities via the concurrent alignment of goals, intentions, and competence with high-, mid-, and low-level affordances. We see our work contributing to domestication theory (Berker et al., 2006; Silverstone et al., 1994), which has tended to focus on how technology finds its place in the moral economy of a household and the types of negotiations and practices that accompany these processes. Further, although the relational nature of affordances is acknowledged (Evans et al., 2017; Sundar, 2020; Treem & Leonardi, 2012) and explored empirically (Costa, 2018), our conceptualization of digital incorporation—based on empirical work—brings these facets together to explain how and why individuals (obtain) value (from) affordances enacted-in-use. In this way, we see our work illuminating existing conceptualizations and extending them by focusing on the lived experience and higher-level affordances and their correspondence to users' higher-order goals, to complement present emphasis placed on low- and mid-level affordances (Bucher & Helmond, 2017; Evans et al., 2017; Sundar, 2020).

Theoretical foundations

Affordances-orientated approach to digital possessions

The term affordance was first introduced by Gibson (1966) to explain the action possibilities available in the environment subject to a person's or animal's capability to act upon them. More recently the term has been deployed in media studies and sociology to discuss how technology shapes action possibilities but also how they are appropriated by end-users. As Nagy and Neff (2015) outline, affordances are created in the interaction between tools and users, and are dependent upon users' expectations and experience as much as the tools' qualities or features. This interaction is situated in-the-doing, and this helps explain the multiple affordances an object may suggest (Evans et al., 2017; Ihde, 1990, Treem & Leonardi, 2012). For Evans et al. (2017), "affordances are a relational construct that sits in between—but do not determine—objects and outcomes" (p. 41). In clarifying and defining affordances, they stipulate that an affordance: (a) is not the object itself, nor a feature of the object, (b) is not an outcome—but facilitates a specific outcome, and (c) has variability or range, which pertains to the notion that users make use of the same affordances to achieve different actions. To use their example, a camera on a smartphone is a feature. The affordance is recordability, and the outcome could be documenting human rights violations. Additionally, outcomes are connected to the goals of the user. In facilitating specific outcomes, Evans et al. (2017) acknowledge that affordances invite action or behavior—they require *doing*. Likewise, in the idiom of postphenomenology, affordances are created in-the-doing because there is a coming together of human and technological intentionality (Ihde, 1990; Rosenberger & Verbeek, 2015).

Drawing on Don Ihde (1990, p. 14) we define technological intentionality as a technology's inherent inclination in terms of how it is to be used. Within the context of digital objects, this intentionality is inscribed by designers who anticipate end-users' goals (Hassenzahl, 2010; Mardon & Belk, 2018) but also accommodate those of platform owners where digital possessions are hosted. These goals may be opaque to users and run contrary to their interests (Airoldi, 2022). For example, while people may realize communicational intentions via their social media accounts, these interactions are concurrently part of data-driven interventions to improve the effectiveness of promotional messaging so that ad revenue can be accrued. This being so, platform goals may be afforded by push notifications to remind users to respond or share content with friends and families to encourage further engagement.

Although technologies are inscribed with a given directionality, how it is realized is subject to a person's own intentions (Ihde, 1990). We can define human intentionality as psychological acts of control that can accommodate underlying goals (Csikszentmihalyi & Rochberg-Halton, 1981). To help illustrate, we borrow an example from Ihde (1990). Compared to a pen, a typewriter promotes written expression that is closer to spoken language, although it does not have a determining influence as we can still type slowly and carefully if that was our intention. Importantly, the ability to perceive and enact this potentiality is context-dependent (Costa, 2018) and hinges on people's own intentions, their own capabilities, motivational states, and knowledge (Orlikowski, 2002; Verbeek, 2016). Situated human intentionality, therefore, drives appropriating actions which allow for the realization of affordances

and may result in selective use of features and idiosyncratic use of technology (Bell & Dourish, 2007; Orlikowski, 2002). Thus, we view affordances as both dispositional and relational entities. In being dispositional, affordances have technological intentionality (Ihde, 1990) which invites certain uses without being deterministic. In being relational, affordances arise from the encounter between people and their digital possessions, including the features of those digital possessions (Evans et al., 2017) and the social context in which those things are appropriated-in-use (Costa, 2018).

To explore why the coming together of technology and human intentionality via the appropriation of affordances may be a source of value, we turn to Belk. For Belk (2014), perspectives like actor–network theory (ANT), postphenomenology, and Active Externalism foreground the agenting potential of material objects' affordances and our dependence on them in actualizing goals. The simple act of harnessing a functional tool like a hammer initiates self-reflective processes where the self structures around its ability to control the hammer to realize a specific intention—hang a picture effectively or achieve a more substantive goal like becoming a carpenter (Rosenberger & Verbeek, 2015). The Active Externalist thesis explains this by arguing that when coupled to an external resource, be it a hammer or an app, the circuitry of the brain is extended, constituting an expanded system. The app that is "there when I need it" becomes part of the package of resources that I bring to bear on the everyday because it forms a two-way interaction (Clark & Chalmers, 1998)—the human and the app work together. This is not always easy and may end in failure. In their study of voice commands on smartphones, Schweitzer et al., (2019) found when user "mastery" is missing or when users feel subservient to the technology and unable to use it to help achieve desired goals, it is often abandoned. However, when coupling does happen, technology becomes "embodied" (Ihde, 1990) or "transparent" (Clark, 2003), and experienced as part of the natural self (Belk, 2014). Digital things such as a calendar or a banking app can become so well-fitted to accommodate everyday goals that they are recruited to action as one would a limb, becoming effectively invisible-in-use (Clark, 2003; Ihde, 1990). This invisibility-in-use is also acknowledged by the ubiquitous computing agenda (Tolmie et al., 2002) which sees computation embedded physically, socially, and procedurally into everyday life "becoming part and parcel of how we act in the world" (Bell & Dourish, 2007, p. 9). Whereas a meaning-based approach purports that a material possession's visibility is instrumental in people's valuation, an affordance-based perspective would posit that it is when a possession becomes invisible that it is most valuable. Only when coupled (Clark & Chalmers, 1998) or entangled in embodied relations (Ihde, 1990) with things do affordances appear as the focal point of attention, thus potentially becoming central components of value judgments.

To understand how affordances are experienced as a source of value for digital possessions, we draw from design typologies of be-goals, do-goals, and motor-goals (Baxter et al., 2018; Hassenzahl, 2010) and distinctions between high- and low-level affordances found in media studies (Bucher & Helmond, 2017). Be-goals are individual, higher-order goals, like "being a caring parent" or "being a better runner" that motivate and underpin all actions. Be-goals are akin to what Belk (1988) has termed "being." Be-goals refer to the "why," "do-goals" refer to the "what" in terms of what needs to be done for a be-goal to be realized. For example, a be-goal of "being caring" may translate into do-goals such as liking a friend's post or paying them a visit. Motor-goals are the "how" and refer to the specific actions that are done, such as use of specific buttons, taps, swipes, and so on for a "do-goal" to be met (Hassenzahl, 2010). Importantly, be-goals can be realized in many ways so there is always an emergent and dynamic quality in the ways they translate into lower-end goals (Hassenzahl, 2010). Bucher and Helmond (2017) acknowledge two levels of affordances. High-level affordances are the dynamics enabled by technical devices, platforms, and media—the way engagement between user and technology is structured. These affordances would be such things as persistence, replicability, scalability, and searchability. These qualities are sought by users, in that they present an attractive way of realizing goals. To borrow from Schrock (2015), the practice of making birth announcements (do-goal) is now enabled through the broadcasting affordances (mid-level) of social media platforms in ways that displace announcement cards. Low-level affordances refer to the technical features of a platform (buttons, screens) and these technical features afford certain actions (clicking, sharing, liking; Bucher & Helmond, 2017). For both Belk (1988) and Hassenzahl (2010), there is a simultaneous integration between goals and being. This integration suffuses any experience with a technological artifact with meaning—in addressing a be-goal, do- and motor-goals acquire purpose and a motivating impetus (Hassenzahl, 2010).

In sum, while the above typologies distinguish types and levels of affordances, and acknowledge that goals direct interactions with objects, this tends to be based on the generation of feelings of ownership to increase object attachment and improve end-user experiences (Baxter et al., 2018; Hassenzahl, 2010). What is unclear is how end-users experience affordances as sources of value for digital possessions. To address these gaps, our objectives are twofold: (a) to uncover sources of value for digital possessions; (b) to understand how value associated with digital possessions is released and experienced by end-users.

Methods

Our methodological approach was rooted in postphenomenology (Ihde, 1990; Rosenberger & Verbeek, 2015). Like phenomenology, postphenomenology is committed to the lived experience, but where phenomenology approaches technology as a "target of attention," postphenomenology adopts a relational ontology, where technology is apprehended as mediating human-world relations (Ihde, 1990; Rosenberger & Verbeek, 2015). Forty-seven in-depth interviews were conducted—34 in-person and 13 online (due to Covid-19 restrictions). Our youngest participant was eight, our oldest was 83 (see Table 1). Interviews lasted between 46 and 240 min. In total, approximately 83 hr of interview data were generated. In-person interviews were audio recorded and took place in the family home. Online interviews were conducted over Zoom. Participants took part in a sorting task, which required them to identify all their digital possessions (e.g., objects, apps, platforms) and categorize those that were considered valuable as well as those they could happily discard. Following comparable studies on valuable possessions (Csikszentmihalyi & Rochberg-Halton, 1981; Richins, 1994), we asked questions about possessions deemed valuable in the

Table 1. Participant profiles

Participant	Age	Occupation
Jack	33	Maintenance operative
Tina	27	Property management
Poppy	57	Key account manager
Adam	8	Student
Kerris	42	Admin assistant
Daisy	69	Post office manager
Tim	8	Student
Matthew	10	Student
Jade	45	Teacher
Greg	47	Creative arts lecturer
Andrew	71	Assistance maintenance manager
Mia	12	Student
Simon	42	Financial services
Ruth	43	Global service manager
Paul	67	Trade manager
Ali	11	Student
Jon	48	Damage assessor
Ann	50	Midwife
Judy	72	Retired
April	15	Student
Felix	49	Financial
Elle	50	Homemaker
Dana	18	Micro-influencer
Dexter	49	Pilot trainer
Julie	49	Marketing manager
Jeanie	70	Retired
Elliott	11	Student
Grant	50	IT programmer
Kat	49	Bio-scientist
Tina	14	Secondary school student
Ayda	18	Student
Mimi	45	Homemaker
Joe	44	Air traffic controller
Jim	16	Trainee chef
Megan	9	Student
Eliza	14	Student
Connie	43	Artist-unemployed
Asher	10	Student
Jan	72	Retired
Jade	61	Retired
Erika	83	Retired
Piper	24	Radio producer
Gavin	24	Shop assistant
Josh	23	Fraud analyst
Rosa	16	Student
Sean	23	Paramedic
Hank	24	Careers advisor

sorting task. Following postphenomenological conventions (Adams & Thompson, 2016; Rosenberger & Verbeek, 2015), throughout the interviews, emphasis was placed on getting interviewees to show us their valuable digital possessions with a focus on specific experiences and feelings related to them.

We included heuristics adopted from Adams and Thompson (2016), such as requiring participants to describe how an object came into their lives. Studying breakdowns, accidents, and anomalies we asked "what would happen if your device breaks or is unexpectedly missing or you don't have it?" We also asked about human capacities that are extended, enhanced, or amplified when a technology is used and what it may render obsolete. These questions bring to the fore things that may be taken for granted or not addressed and require participants to consider their relationship with the object and its role in their life more deeply.

Following transcription, an interpretative pair (the lead authors) independently analyzed each transcript ideographically with the purpose of understanding how digital possessions were experienced as valuable. Specifically, these ideographic accounts drew out stories related to experiences with positively valued digital possessions, relationships with those possessions, the ways these enabled and constrained certain experiences to be had, and so on. We then conducted cross-case analysis, which enabled the identification of recurring global themes (Thompson et al., 1989) such as reduced attachment to singular possessions and the increased dependency on and saliency of affordances. Following interpretivist research conventions, throughout the process, we ensured that interpretations were underpinned by the participants' own words to ensure descriptions were at the level of lived experience (Thompson et al., 1989). The interpretative pair also facilitated "bracketing" by questioning assumptions and reducing the potential for bias (Thompson et al., 1989). These steps were vital in distilling how experiences of value were experientially similar even though specifics may have differed, for example, participants noted how valued digital possessions helped look after children. For some, this meant increased monitoring and surveillance. For others, it meant "getting to know them better."

In line with postphenomenology, we reflected on the data gathered and "emulate human-technology-world entwinements through textual description" (Adams & Turville, 2018, p. 12). That is, we noted the role of digital possessions in participants' accounts and the value individuals ascribed to them, which enabled us to identify how digital possessions act in and on lived experience. As the two lead researchers compared emerging themes across interviews, reinterpretation took place considering new insights (Braun & Clarke, 2006) based on the stories and experiences of our participants and informed by our knowledge and reading of the literature (Thompson et al., 1989). Illustrative stories of themes were identified and are presented below.

Findings and discussion

Affordances as sources of value

Digital possessions themselves were often not the focal targets of possession or cultivated with meaning as reported in previous studies (Denegri-Knott et al., 2012; Odom et al., 2011; Watkins & Molesworth, 2012). This lack of attachment has been attributed to the dematerialization of consumption, which in turn has weakened people's desire to own things and encouraged modes of access like streaming (Bardhi & Eckhardt, 2017; Belk, 2013). We were surprised to find mundane and ephemeral digital possessions like food apps, calendars, bits of code, and snaps being identified as valuable.

Many of our participants found it difficult to identify a specific in-game item, digital photo, text, or document that was valuable. Indeed, many of the valued digital possessions selected often lacked indexical properties in that they were not experienced as carrying accumulated special meanings, either as digital patina (metadata such as tags, timestamps, and comments; Odom et al., 2011) or mental patina (the accumulation of memories associated with digital possessions; Molesworth et al., 2016). Rather, the lack of durability that is said to make digital possessions poor vessels of meaning (Atasoy & Morewedge, 2018; Petrelli & Whittaker, 2010)

was an objectual characteristic that imbued digital possessions with value. Highly valuable possessions, as we will show in the following data entry, were allowed to disappear, eliciting from participants little effort to make durable either by saving or creating iconic replacements as reported in past studies (Denegri-Knott et al., 2012; Odom et al., 2011; Watkins & Molesworth, 2012). When we talked to Tina, a 13-year-old secondary school student, she identified stories and memes that she had created and received as valuable to her, but she no longer had or was not too bothered about losing.

> Tina: "Sometimes, like Mariana everyone makes fun, well they don't make fun of her, but they talk about her legs and people joke about it and sometimes there are memes about having legs like Mariana's. And she sends them to me, and then it reminds me of her because it's like her, like the meme is about her . . ."
> Interviewer: What would it mean not to have this meme?
> Tina: "I wouldn't feel I mind that much because we all remember it in our heads, so we don't need a copy of it."

It is the active creating and sharing of this meme that means Tina can connect with her friends, which she values, rather than the inherent compositional characteristics that enable the affixture of meanings for future reminiscing. Note how there is not much reflection in terms of the value that the messages will accrue over time because they were written together, and therefore, they are likely to accumulate digital or mental patina (Odom et al. 2011; Watkins & Molesworth, 2012). Instead, she tells us about funny pictures she is planning to make and share with her friends. Tina recalls and reflects on what she and her friends were "doing" and the value of that, rather than of the meme/message itself—or "having." The affordance is valued because of what it can help her do and what she can be(come). Avid videogame players were also nonchalant to see games they had been playing for years deleted, even if they reminded them of good times or past achievements.

Instead, salient in the valuation of digital possessions, were their affordances. This saliency is captured by Felix's experiences. Felix is in his late 40s. He has worked for the same financial organization for over 20 years and is a keen videogame player. For Felix, the focal object of attention is what his digital possessions afford him rather than their associated indexical meanings. He valued Clash of Clans because it allowed him to enjoy the challenge of strategizing within the game, without the worry of failure, which is a risk he had to circumvent in his working life. He also valued the social contact. As Felix told us "it is not about the collections. It's about the contact I can get in games. So, it's the social side of games that I value." Grant, who worked in IT and is the father of three daughters, expressed a similar valuation when asked if he valued the movies he had purchased on his movie app more than the movie app/platform itself: "No it's not. I suppose it used to be the case with DVDs. . . but not now that we are streaming; instead that the app provides a means of getting the family together," adding "it's something that we all enjoy doing together. It's one of the few things left [that we do]." Thus, digital possessions were highly valued for the relational and personal goals that they support.

Generally, valuable digital possessions were experienced as useful cultivating tools, which could be called to-hand to realize all sorts of goals and intentions. They often disappeared in-use and were not terminus of participants' attention. In the same way that when driving a car, where the focus is placed on the road and surroundings rather than the car and its components (Ihde, 1990), the value of digital possessions is rooted in what they afford within the practices in which they are integrated. In the first instance, valued digital possessions tended to be those perceived to extend the capacity to access, accumulate, process, and store all sorts of information which inform everyday practices. Mundane, yet valuable digital possessions like communication, maps, and email apps seemed to operate as pivotal nodes in dispersed practices like recalling and reminiscing, and in more complex integrative practices like cooking, parenting, and working (see Schatzki, 1996). The fact that their objectual characteristics were little known and that they did not have full control over them did not reduce their value as anticipated (e.g., Atasoy & Morewedge, 2018) but rather, assessed from the idiom of goal-realization, they acquired highly valued properties that our informants relied on. Kat, a scientist and mother of three, offers a good illustration of this. She identified her WhatsApp and calendar app as valuable. Her memory, she said, "isn't great" and "with a job and three children [she] would find it quite hard to manage family life without it." She told us about a close friend she meets once a year and how she relies on her messages to remember:

> . . . we meet up and we just talk about everything that's happened in the year . . . she texted me about it the other day . . . And I was thinking, I can't remember what she told me that she was up to last time I had contact with her. So, I went back through the messages and she had one of her daughters who's got lots of medical problems. So, I was just reminding myself, you know, of what had happened.

Kat turns to her apps as part of her extended mind rather than her biological brain to remember what medical problems her friend's daughter had. Likewise, her calendar remembers and organizes life for her—keeping track of small jobs such as answering emails or "making notes about things she wants to discuss with somebody," keeping track of recurring events, and alerting her children and family about upcoming events and her availability.

Other valued digital possessions were experienced as central to more complex integrative practices, like shopping and videogame playing to working and parenting, where goals tended to be self-orientated or relational in nature. Jack, a father who runs his own property maintenance business, identified his social media and accounting apps as his most valuable digital possessions. Jack relies on Facebook to get business as well as its messaging services to communicate with clients. He uses an accounting app to keep track of his income, invoices, and tax returns. He values these for their "ease" and "simplicity." Jack explains how his valued digital possessions enable him to run his business and provide for his family:

> So it is, basically, just my lifeline and provider for my family, really. That's exactly how it feels for me. If I didn't have that for a week, then I wouldn't be able to work. I wouldn't be able to get messages. I wouldn't be able to promote my business. I wouldn't be able to do anything, really . . . It's just ease and simplicity for me running my business.

Without them, as he put it, he would not be able to promote his business, get messages, or even get around without his satnav [GPS navigation tool]. Without this, he would be unable to "provide for his family." Here he makes a connection between trivial and mundane actions, and realizing a higher order be-goal—that of being a provider for his family. Similarly, Elle, a mother of three, valued her Facebook and Dropbox as tools to help nurture her daughter's desire to be a professional dancer and excel at dance competitions. Without the visual record of routines and feedback from judges saved to Dropbox, she told us she would not be able to offer her daughter guidance, thereby unable to realize her ongoing goal of being a supportive parent.

As our data entries show, digital possessions are indeed useful, but this does not make them less personally valuable even if they were devoid of indexical associations. They are intrinsically linked to self-oriented and relational goals, contrary to arguments made elsewhere (Atasoy & Morewedge, 2018; Bardhi & Eckhardt, 2017; Siddiqui & Turley, 2006). Valued digital possessions were so intertwined with everyday practices they had become invisible-in-use. They formed tightly-bound coupled systems binding people and digital things where the self is experienced as actually being extended in its ability "to do." So much so, that without their affording capabilities, participants often felt lost, unable to perform basic functions like logging into work, doing bookkeeping efficiently and without stress, or maintaining friendships as reflected by Felix who, upon losing a contact, told us "friendships die because you don't have a contact capability." Similarly, a young chef told us that he had to break up with a girlfriend because his parents limited his use of a social media account, and without it, he could not "be a supportive boyfriend." Having presented valued digital possessions as cultivating tools and identified affordances as sources of value—extending capabilities, enabling goals to be achieved—next we consider the process through which affordances become sources of value.

How affordances become sources of value

Since valued digital possessions were experienced as cultivating tools, value was experienced "in-the-doing." In their work on unremarkable computing, Tolmie et al. (2002) argue that the perceptual qualities of objects themselves are not focal, but the ways they are embedded into routines and practices that help individuals achieve goals are central, to the point that such objects become unremarkable or even invisible-in-use—they are simply "a resource to bring about what they are really after" (p. 401). The matter of significance, they argue, is not on "what is done" but what is "done in the doing," to the point that the most remarkable resources (digital possessions) are those that can be "unremarkably embedded into routines and augment action" (Tolmie et al., 2002, p. 404). This invites revision of assumptions inherited from material possession studies that kinetic and contemplative objects have distinct objectual characteristics and require different actions to release meanings and therefore value (Csikszentmihalyi & Rochberg-Halton, 1981).

In the context of our study, we found that kinetic and contemplative actions were enacted concurrently in-the-doing. Because of their lack of objectual durability, all digital possessions mentioned by our participants required kinetic actions like turning devices on and opening apps to be made present. In effect, all digital possessions can be de-facto kinetic objects; however, doing also needs to be done for contemplative value to be released and when more things are done (sharing, commenting, liking), further value is released and experienced. Digital photographs or playlists are valued in an active sense—as something to share, something to edit, something to curate together. Rosa, a 16-year-old college student explained how she bonded with a boyfriend while "listening to music together":

> One of my best experiences was when that person made me a playlist and having music as a love language, in a way, it was like one of the best experiences I got from it, because, you know, like that person used that love language as a way to listen to songs together . . . You can start a group session and that person can join. So, when you're listening to the playlist, you listen to it together at the same time. And that was kind of like a bonding experience because even though we were not next to each other, like it was still kind of like, you know, we still felt each other's presence through listening to the same music at the same time and listening to the lyrics . . .

Like Rosa, most of our participants, when asked about why their photos or playlists were valuable, shared stories about being able to connect with others by sharing special photos via social media, sharing fitness data, or curating playlists together in an ad hoc fashion in preparation for a car journey, party, or family holiday and so "the doing" carries and creates additional value that without action would remain latent. It is in the listening together, where, to cite Rosa, you "can feel a loved one's presence." This, in part, draws from Costa's (2018) work on "affordances-in-practice," which acknowledges that it is only in-practice that affordances can be understood because material, social, and cultural practices, and circumstances, along with situated use by specific users, gives shape to affordances. In Rosa's case, appropriation of affordances aligns with the goal to "be loving" in the creation of a playlist and is experienced positively, however, this is not always the case. Appropriation of affordances may result in displacements of other ways of achieving goals that are deemed more authentic or meaningful. For example, visiting a friend rather than messaging or using an analog camera to achieve a more labored and meaningful form of photography (Humayun & Belk, 2020).

For us, the role of goals is most important in shaping the "ongoing enactments by specific users that may vary across space and time" (Costa, 2018, p. 3653). It is not just a case of what a digital possession affords but what one can do with it based on understandings, competency, and of course goals. Just as when people come together with their tools, there have always been workarounds - people use tools in ways they are comfortable with - the dynamics of goals, intentions and competence, and how these come together, need to be considered. We now elaborate on how this happens.

Digital incorporation processes

For value to be realized in-the-doing there needs to be a coming together of human and technological intentionalities via the concurrent alignment of low-, mid-, and high-level affordances with individual goals, intentions, and competencies. This is accomplished via a process we term digital incorporation. In the context of material possession, incorporation has been used to describe the means through which symbolic self-

extension is achieved by seeking symbolic contamination from a positively valanced source through aura absorption (Belk, 1988). By digital incorporation, we mean the processes through which digital objects are appended to the self in a literal sense, creating ad hoc coupled systems where goal-attainment is jointly enabled by people and their digital possessions. Since goals are connected to the self this inflects actions with their significance (Hassenzahl, 2010); it is their enactment in-the-doing that is experienced as valuable. Where existing work distinguishes between levels of affordances, these do not sufficiently capture the dynamics of affordances our participants experienced because they do not distinguish between human intentionality and intentionality embedded in digital possessions. Also, the notion of motor-goals is technology oriented, rather than user-oriented (Hassenzahl, 2010). This obscures the role of the users knowledge and skill, which is central to appropriation (Orlikowski, 2002; Schweitzer et al., 2019) and therefore, in the realization of value.

To create a clearer distinction we use the terminology of goals, intentions, and competence. This introduces a third, higher order affordance level to existing work (e.g., Bucher & Helmond, 2017) that recognizes mid- and low-levels, but not the be-goals they relate to (high-level). By high-level affordances, we mean the correspondence between a digital possession and a person's goal, for instance, that Netflix can be incorporated as an appropriate tool to "being connected to the family" or "being a nurturing parent." Intentions are specific goal-directed actions for which digital possessions are used. We could see intentions as a series of sub-goals, for example, Jack's goal of being a good provider involves the use of QuickBooks for accounts and Facebook for business-related marketing and communication—the same goal has several intentions that are fulfilled via different digital possessions, each providing value but in diverse ways. Mid-level affordances relate to the dynamics enabled by a platform and the structures of engagement. For Evans et al. (2017), these are affordances themselves (e.g., anonymity, visibility), but intentions capture the individual's experience and perspective. Likewise, low-level affordances refer to the features or functions while competence acknowledges the individual's proficiency to use those features or functions for a given purpose (intention).

Digital incorporation builds on the ideas of appropriation and incorporation, which, in domestication theory, refer to how a technology is used and what it is good for (Silverstone et al., 1994) as well as how it is incorporated into everyday life and routines (Martínez & Olsson, 2021). Although researchers acknowledge the need to account for digital technologies beyond the home via "externalization" (Brause & Blank, 2020) and the blurring of private/public life, work remains at a macro level and is less concerned with individual experiences or accounts of how digital technologies and their affordances relate to individual goals. Similarly, in organization studies, the importance of the socio-cultural context in shaping the appropriation of technology is highlighted as well as users' competency and knowledge (Orlikowski, 2002), but not underlying, individual goals. Our proposed framework brings these two elements together and draws attention to the vital role higher-order goals have in saturating affordances with value.

Through the process of digital incorporation, we locate how digital possession affordances plus human intentionality—people's goals, intentions, and competence—come together and are enacted within the situated context of everyday practices, releasing value. This is neither a static nor deterministic process, rather it accounts for the shifting configurations of human and technological intentionality, and variations in context which shape the coming together of both forms of intentionality. As our data entries show, an individuals' goals align with high-level affordances (suitability between goal-attainment and a digital possession), specific intentions with mid-level affordances (using an app to fulfill a specific purpose or intent), and individual competence with low-level affordances (using features which are within the remit of one's competence). When these come together in-the-doing—a digital possession is used in a certain way based on competence to achieve a specific intent to fulfill (or work towards fulfilling) a specific goal—affordances are enacted which leads to value being experienced.

Given the suggested three-level model of affordances, digital incorporation emerges from the simultaneous activation of affordance levels to be integrated into a valuable whole. We see this as a situated coming together of human and technological intentionality embedded in digital possessions themselves. It is important to note that although any digital object can potentially be subjected to this process, only those things that are sufficiently mastered to enable goal-realization (Schweitzer et al., 2019) are likely to become transparent in use and positively valued. When digital possessions do not enable goal realization—because there is a poor alignment between goals, intentions, competence, and high-, mid-, and low-level affordances—digital incorporation processes become truncated, impeding the coming together of human and technological intentionalities that release positive value.

To illustrate digital incorporation, we return to Jack (see Figure 1). He explained why he valued his QuickBooks account as follows:

> QuickBooks is my accounts, which basically has my business account attached to it, so then I can see my spending and income and also it files them all for me into different categories and then whenever it does come round to tax time, I can open up a file on there and it will give me a breakdown of everything, so it basically does my tax return for me. . . all my business accounts are there, my banking is there, my calendar is there, all of my information is there for customers, so I can quickly get on to them and send invoices, quotes, quickly check my bank, send bank details, send money around, do whatever I need to do.

The high-level affordances of QuickBooks support the management of his business accounting through which his ongoing goal of being a provider for his family can be realized. In taking care of his tax and accounts (intention), he benefits from platform dynamics (mid-level) such as monitoring, sorting, and auditing. Jack's competence (level of technical proficiency and understanding) also shapes how low-level affordances (specific features like bank feeds, invoicing, and receipt organizing buttons) are realized in use. Jack also uses Facebook for his business which affords him the capability of running and growing his company by giving his business visibility and persistence (intention/mid-level) through messaging clients and uploading images of his work for prospective clients to see (competence/low-level), which, in turn, helps him make money to support his family and be a good provider (goal/high-level). There are certain features he chooses not to

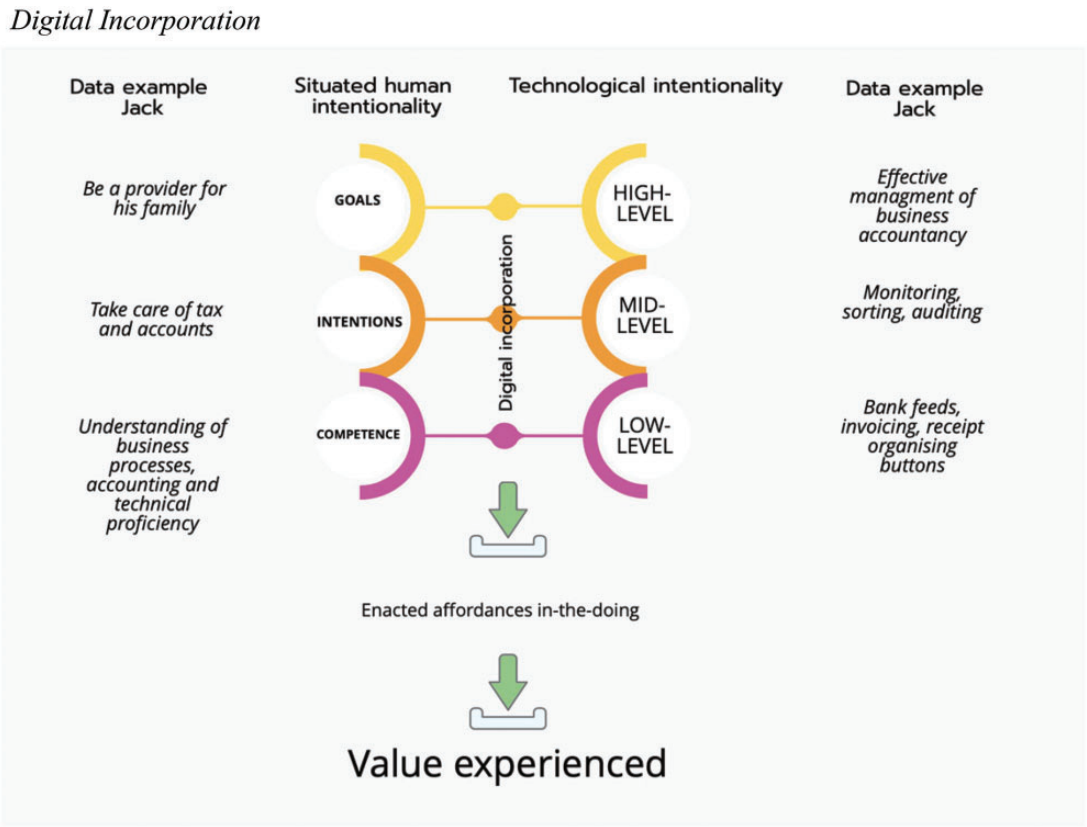

Figure 1. Digital incorporation.

use, such as paid promotions—because he currently has enough business and it is outside his level of expertise.

Several factors are important contributors to how goals/high-level affordances are enacted. These involve an individual's ability to understand mid- and low-level affordances, which is based on their situated understanding of platform affordances (e.g., what certain platforms or apps offer/enable—mid-level) and their level of competence related to specific features (clicking on the right buttons—low-level). It also requires identification of an appropriate possession through which to realize goals and intentions (high-level). For example, Jade chooses her YouTube account to understand and connect with her 13-year-old grandson (intention/mid-level) in ways that can help realize her goal of being a good grandmother (goal/high-level).

> I actually write notes on what he says because it means nothing to me, but I need to be able to talk to him about it . . . I just feel it gives me a link, especially as he becomes a teenager. I need to be in his world because he's not coming into mine, you know? . . . But then there is the issue of 'does he really want his Grandma watching his YouTube channel?' But I just, he always calls me, you know, when he does any coding or anything like that. As soon as we go in, then he always goes 'Oh Grandma, come and look at this that I've been doing'. And I just feel that, you know, he feels it's interesting to be able to talk to somebody who's also interested.

Jade's experience demonstrates how she uses YouTube to develop her relationship with her grandson and this goal is what drives her use of the platform. Jade is keen to view and comment (competence/low-level) on her grandson's videos on YouTube to better connect and understand him (intention/mid-level) and be a nurturing grandmother through a possession that is congruent with her goal (goal/high-level), as she puts it, "I need to be in his world because he isn't coming into mine." She avoids certain features to avoid him embarrassment or because she is not confident in their use. For example, she does not actively seek interaction through the comments feature because she anticipates that "he wouldn't really want his grandma watching his YouTube channel." Rather than following or subscribing to his channel so that she gets notified when videos are uploaded, she goes into YouTube and searches on a regular basis to see if he has uploaded anything new and then will view and make her notes for things to talk to him about. This could potentially be easier for her if she was a more competent user of YouTube. In another example, Grant digitally incorporates his Strava account as a cultivating tool to connect with his brother. He shares his data only with his brother, who is also a runner and with whom he has a "friendly rivalry." He values his Strava account to bond with his brother but not "broadcast it"—because he regards people who share their data widely as "needy," and therefore is selective of sharing features (low-level affordances). Returning to Jack, his digital incorporation of social media was tempered by his dislike of socializing online. Mid- and low-level affordances that accommodate that goal were shunned: "I don't need it for the social aspect of, you know, social media and all that sort of thing. I don't care what other people are doing." We can see, in these examples that their own understanding about sharing in public spaces is a factor

and, for them, affordances are incorporated in ways that limit the sharing aspect so that their own goals of being a certain type of person can be realized and affordances align with their own intentions.

Thus, digital incorporation processes were situated and fluctuating, depending on the saliency of goals, but also subject to alignments between human and technological intentionalities. For Grant, for instance, his valorization of his tracking data is bound to his engagement in running practices, but also his goal of being a good brother. When he is active at running, the ability to capture achievements and cultivate competency in running is valuable—to improve his running and beat his personal best. When this goal is not salient, relational affordances gain greater significance. For Jade too, her YouTube account acquires distinct significance subject to the saliency of her goals and the alignment between her intentionality and that of her account. Here we see how low-, mid-, and high-level affordances come together in an idiosyncratic manner based on situated goals and if goals were to change, coming together between human and technological intentionality would too. Following a "hard time" and some detriments to her mental health, Eliza came off social media for a while and when returning to it, she no longer posts things about herself on Instagram because it makes her "really anxious." Instead, she interacts with her friends by commenting on their posts and mostly uses it for the Discover Page to find recipes and workouts. For Jade, her YouTube account is a cultivating tool that helps her connect with her eldest grandson, but not with her younger grandchildren—for this she opts for casual gaming. In these cases, we observe that what makes a digital possession a suitable cultivating tool hinges upon situated judgments people make relative to the commensurability between goals and digital possessions—something we have been referring to as a high-level affordance. If digital possessions are judged to be appropriate cultivating tools to realize goals (high-level affordance), intentions align with mid-level affordances, and users have sufficient competency to realize intentions via low-level affordances, then digital possessions will retain their positive in-the-doing value.

Conclusions

To conclude, we are in broad agreement with previous studies that digital possessions are experienced as largely useful things (Atasoy & Morewedge, 2018; Belk, 2013; Siddiqui & Turley, 2006) but offer a corrective to the assumption that this makes them less valuable. While measures of value in lieu of indexical meanings are well-evidenced to indicate a possession is valuable (Kleine & Baker, 2004; Richins, 1994), even for digital objects (Denegri-Knott et al., 2012; Odom et al., 2011; Watkins & Molesworth, 2012), in this study we found that digital possessions can also be valued as situated cultivating tools that are entangled with identity and relational goals. This, we have argued, happens through digital incorporation processes.

These findings may not be consistent with experiences users have with digital objects inscribed with specific affordances that make them more singular and controllable (Denegri-Knott et al., 2020; Mardon & Belk, 2018). To illustrate in a gaming context, mechanisms of object circulation could enhance controllability and thus enable people to gift a digital possession—an avatar, skin, or accessory—which can then be experienced as singular (Mardon & Belk, 2018). Similarly, some NFTs like Crypto Kitties can be inscribed to be unique and increase owners' control via contractual agreements allowing personal or commercial use of the art associated with them. These and other affordances could facilitate object-self relations where the object is the focal point of attention, encouraging possession processes that imbue them with indexical meaning (Mardon & Belk, 2018). While these affordances should encourage positively-valanced relationships—given that controllability and singularity correlate with feelings of attachment (Kleine & Baker, 2004) and self-extension (Pierce et al., 2003)—this is yet to be scrutinized empirically. Such studies are pressing, given the lack of understanding surrounding whether NFTs increase people's control over their digital possessions. In reality, these are fragmented and bound to a hosting platform's terms and conditions and pertain to a token and its metadata on a blockchain rather than a digital possession, limiting people's genuine control over them (Belk et al., 2022; Marinotti, 2022).

Notwithstanding these differences, our digital incorporation framework can be productively used to study all sorts of self-digital object interactions. We agree with Mardon and Belk (2018) in believing that there is great variability in digital materiality. Digital objects are inscribed with different affordances that, in dynamic and situated interaction with people's goals, intentions and dexterity will result in different possession permutations and valuations. Objects that are inscribed to be singular, controllable, and authentic may become focal targets of attention, whereas many of the possessions we have reported on here, in lacking these characteristics, tended to disappear in use, making affordances the focus. Importantly, our framework sensitizes us to the contextually-situated human input (goals, intentions, and competence) that in coming together with high-, mid-, and low-level affordances release value.

Our work contributes to CMC scholarship, where affordance studies tend to focus on defining and categorizing low- and mid-level affordances (Evans et al., 2017) or on affordances in specific contexts (Lane et al., 2018; Merrill & Åkerlund, 2018), by offering a view of affordances as they are used—in-the-doing—to ascertain an understanding of how and why affordances are valued by individuals. In addition, by accounting for the value of enacted affordances to individuals, a possession-based, lived-experience approach sheds new light on affordances and their vital role in everyday life and goals. We show how this happens via the coming together of human and technological intentionality and the coalescing of mid-, high-, and low-level affordances, drawing attention to their situated and dynamic interaction.

Our approach can also be used to study other aspects of affordances and their—potentially negative—impact on daily life. For example, where research explores the social affordances of digital technologies to consider societal and communication problems and goals related to individualism (Wellman et al., 2003)—could the affordances of communication apps mean breakdowns in communication and negatively impact relationships as a result? Or issues whereby individuals and technologies have competing goals and concerns regarding the degree of human agency over technologies and AI (Sundar, 2020).

We suggest the following research openings. Future research could consider how affordances are enacted in networks that encompass other actants beyond a possession target and an individual as we have done here. For this, ANT

(Latour, 2005) could help understand the situated and fluctuating configurations of human and non-human actants where affordances are enacted to produce a valued digital possession. For example, such studies could document the role technical artifacts (e.g., hardware, software, blockchains, legal arrangements, and other internet infrastructures) have in mediating relations between users and their digital possessions.

Additionally, research could also focus on how people deal with positive and negative affordances associated with digital possessions and the types of processes activated to deal with this negativity. In material possession studies, objects that are "no longer me" are often divested (McCracken, 1986), however for digital possessions that are fully integrated into everyday practices, forms of co-dependencies take root and may be difficult to untangle, despite the negativity (Hodder, 2018). To better understand the implications of these people-digital co-dependencies, Hodder's (2018) entanglement concept could be used to map out the broader web of people and things that are enmeshed with people-digital dependencies, and the constraints and possibilities that they may facilitate. Such work could help illuminate the outcomes of such co-dependencies and consider positive and negative outcomes for individuals, platform owners, the environment, and society at large.

Our recommendations for further research and proposed possession-orientated approach rooted in affordances can move the agenda from documenting *use* to one that accounts for *value*. This shift is timely. As noted by Sundar (2020), tensions and coalescing between machine and human agency will require theoretical approaches capable of understanding the human experience and psychology of algorithmic interactions in the era of artificial intelligence. Possession-orientated research, in focusing on digital object-self intermingling and their outcomes, can make positive contributions to CMC research by explicitly asking questions about the value of these and other interactions.

Data availability

The data are not publicly available due to their containing information that could compromise the privacy of research participants.

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